A Sociodemographic Study of Only-children and Only-child Fertility

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Thesis submitted for the degree of Doctor of Philosophy in Sociology

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Abstract

This thesis explores only-child fertility from a sociodemographic perspective across three main chapters. The first substantive chapter examines trends in the proportion of women with an only-child across 125 countries, from 1920-79 birth cohorts, with combined data from different sources. The results show that the prevalence of only-child fertility has increased across the globe. However, as overall fertility reaches below-replacement, trends become more heterogeneous, and factors beyond a country's cohort fertility rates and mean ages at childbearing become more important in dictating these prevalences. The second substantive chapter, with data from four countries in the first two waves of the Generations and Gender Surveys, explores fertility intentions and the realisation of those intentions in Eastern and Western Europe for a first and second child with the use of probit models with sample selection. The results show that while people seem to consider families and friends' opinions, as well as what they believe to be the pros and cons of having a child when forming their fertility intentions, the actual realisation of intentions is more strongly guided by their perceived financial and physiological conditions for having and raising a child. The chapter further discusses differences between Eastern and Western Europe, and between those having a first and second child. The final substantive chapter explores behaviour differences between only-children and children with siblings in the British context with data from the Millennium Cohort Study. Results of a series of logistic models for children aged 3-14, show that only-children have higher odds of presenting abnormal peer behaviours, but fared better than children with siblings in conduct scores. However, the conduct score advantage for only-children disappears when only firstborns or only children with a resident father are considered.

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Introduction

1.1. Overview

Over the last few decades, many authors have discussed how family as an institution has changed, following the demographic transition (Bumpass, 1990; Furstenberg, 2010; Goldani, 1993). One of the main reasons for this change is the fall of fertility and the sharp decline in the mean number of children per women that accompanied the demographic transition in countries all over the world (Lam & Marteleto, 2013; Lee, 2003). This has led, first of all, to a reduction of family sizes and, consequently, to a transformation of its structure.

This transformation does not necessarily mean a loss of complexity of family arrangements. The patriarchal model of family has become less prevalent, and new family structures have become more accepted, such as single parent households, cohabitation through informal unions, same sex marriages and skipped generation households (Bengtson, 2001; Blau & Klaauw, 2013; Cherlin, 1999; Jiang & O'Neill, 2007; Scherger et al., 2016).

Among these are the single-child households – a consequence of the increase in women who finish their reproductive period with one child. However, despite their likely growing prevalence, not much has been researched about them, and much still remains unclear. Has the prevalence of only-children and only-child fertility increased for all societies? Is there a pattern to this increase? Are women choosing to have a single child, or were there other factors that led them to this outcome? Does growing up without siblings affect a child well-being? Is there any truth about the negative stereotypes perpetuated about only-children?

These questions will be addressed in this thesis in three self-contained chapters, each with a different geographical scope, dataset and research question. The first

substantial chapter of this thesis provides a global overview of the trends in only-child female fertility across a good part of the 20th century. The second chapter explores the gaps between desired and observed fertility for women in European low-fertility contexts. The final substantial chapter examines behaviour differences between only-children and children with siblings, with the United Kingdom as its focus.

As it will be shown in more detail over the chapters of this thesis, there's still a lot we don't know about the prevalence of women with an only-child across the world. When only-child fertility is considered, it is usually within studies of parity distribution and, due to lack of data, most of the literature is focused on developed countries. When considering the only-children themselves, most of the literature comes from the field of psychology, is focused around specific countries, such as China and the USA, or also deals with data limitations.

While studies on parity distribution are relevant in their own right, and allow for comparison between parity outcomes, the focus is taken away from each specific parity, and only-child fertility can end up overshadowed or seen simply as a stepping stone to a second child. With that in mind, this thesis is focused on the only-child fertility, with other parity outcomes used as comparison when relevant.

This research will contribute to the sociodemographic literature on fertility and family change by focusing on this understudied group. From an empirical point of view, the results will help to clarify differences between the only-child and the other fertility outcomes. The substantial chapters also present an up-to-date summary of the literature on only-children which can be useful for any future research on the topic.

1.2. Background

All countries in the world eventually experience the demographic transition and, consequently, a fall of fertility, albeit at different speeds and at different times, creating

particularities for each context (Lee, 2003). The transition is also accompanied by a series of cultural, economic and social changes that affect fertility rates (Reher, 2011). For example, in recent decades, we see an increase in divorces, postponement of first marriages, remarriages and cohabitations (Cherlin, 2004; Furstenberg, 2010; Gerson & Torres, 2015; Glick, 1984). Late marriages lead to a delay in the age at first birth, and divorces may lead to an unintended early effective termination of the reproductive period (Cohen & Sweet, 1974). These, combined, may lead to a decline in overall fertility.

We would expect that, as fertility falls, the prevalence of only-children would increase. However, a general fall of fertility doesn't necessarily translate into a fall of fertility for all women within a society, and women from different socioeconomic groups can experience distinct fertility intentions and behaviours (Basten et al., 2011; Guerra et al., 2016; Singh et al., 1985). Moreover, two societies with similar total fertility rates could present very different prevalences of only-children due to the parity distributions of women in each society, specifically due to varying levels of childlessness.

Here, it is important to elaborate on the theoretical definitions of only-children and only-child fertility. At first glance, it may appear simple to define an only-child as "someone without siblings", but that definition grows in complexity when we consider the varying definitions of "sibling". Would that include only biological siblings, or also step and foster siblings? Does it include (half) siblings that live in different households? Could two cousins of similar age who live in the same household be considered only-children if they are essentially living as siblings? What about siblings with a large age gap who essentially lived their formative years as only-children? Considering only-children from the parent's perspective adds another layer of complexity: If a woman who has one biological child marries someone with a child, could she still be considered a

mother of an only-child? That might depend on the age of the children, or the extent of her role as a parent of this stepchild.

Over time, and across different societies, it is also possible that the most fitting definition for an only-child will vary, especially as the pathways into having an only-child will also change. In settings where childbearing outside of union is uncommon, such as in some early transition societies, most only-children would be from a two-parent household, same as children with siblings, reducing the amount of step-siblings children would have. At the same time, extended-family and multigenerational households were also more prominent in early transition, and would increase the chance that an only-child would share resources (economic, but also time spent with parental figures) with other children in their family, such as cousins.

In later stages of the demographic transition, nuclear households become more common, but so does union breakdown due to divorce. This could, on one hand, decrease the chance of a child having biological siblings, but could increase the chance of step-siblings due to remarriage, for example. As most demographic data relates to the household and not the family, it is tricky to identify step-siblings that live separately; and this becomes an increasing concern in recent decades, as that arrangement becomes more common. The lack of data on male fertility is also a limitation for these definitions, as we may have missing information on a possible paternal half-sibling. As discussed by Chanfreau & Goisis (2022a), as equal childcare between divorced couples becomes more common (as opposed to being mostly done by the mother in the past), the lack of data on the existence of step/half siblings becomes even more problematic for studying only-children, as we do not know the real level of contact between children living in separate households.

The difficulty in finding an exact definition of "only-children" across the literature, coupled with these data limitations, means that the best definition for "only-children" will be context dependent and likely guided by the focus of each study. For certain studies, coresidence with siblings may be more important than sharing the same biological parents. However, it other instances, for example when looking at patterns of care for elderly parents, coresidence during childhood may be less important to consider. Across the chapters of this thesis, the exact definition of an only-child used for the analyses is guided by the data availability, goal of the study and research group in question.

1.3. Contextualising only-child studies

Very few studies focus on the demographics of only-children and their families, especially for the global South. In Europe, the region with the lowest fertility rates, the percentage of women with an only-child seems to be between 10-35% (across the 1930 to the 1970 birth cohorts), according to figures presented by Breton and Prioux (2009). In regards to only-children specifically, results tend to lack comparability, due methodological and data limitations.

It is in this context of low fertility and changing family dynamics that Lesthaeghe and Van de Kaa (1986) have developed the theory of the Second Demographic Transition (SDT). According to this theory, modernized societies, after completing the first transition, experience a change in attitudes and norms, and people seek more individual freedom, self-realization and a separation from government's control. Countries going through the SDT would experience rise in divorce and cohabitation, fertility postponement, higher secularization and increased gender equality. This would lead to an intense transformation of the family and possibly an increase in fertility intentions for a single child.

However, despite all these socioeconomic and cultural transformations, the two-child family is still the norm (Sobotka & Beaujouan, 2014). An important factor in steering fertility decisions is what is considered the "ideal family size" in a society, which influences the individual choices of preferred family size as well. According to Sobotka and Beaujouan (2014), the desire for no children or a single child has increased in some European countries, however most women still prefer to have two children. At the same time, it is possible that women who desire to have two children are unable to meet those intentions (due to biological, social, cultural or economic barriers for fertility), which would then lead to an increase in the number of women with an only-child (and possibly also childless women). Therefore, to fully understand the changes in the prevalence of only-children, we also need to look at fertility intentions and realisation of those intentions.

One of the reasons why parents cite wanting to have a second child is due to the negative stereotypes attributed to only-children still prevalent in most societies. Only-children are often regarded as problematic, antisocial or overall maladjusted (Falbo, 2020; Falbo & Polit, 1986; Mancillas, 2006). Many studies on the topic find no or weak evidence to support these stereotypes, and yet they persist. It is possible that, so far, studies have not captured the behaviours that people consider off-putting about only-children. The current literature on the topic also lacks better geographical cover, and is possible that these behaviour differences exist in some societies, but not others. Or even that these stereotypical behaviours only manifest across a certain age range, or other sociodemographic subcategory, and more research is still needed to fully assess these questions.

The study of only-children, similar to studies on childlessness, becomes more relevant as more and more countries reach below replacement fertility, and is important

as a complementary analysis to parity distribution studies. In the same way that being childless is more complex than simply not having children – requiring further understanding on the mechanisms that lead to this outcome, as well as its consequence for individuals and societies – having an only-child (or being an only-child) comes with its own diverse set of drivers and consequences. The persistent negative stereotypes about only-children affect both the child and their parents (Laybourn, 1990). This thesis will tackle these gaps in the literature to further our understanding about this demographic group.

1.4. Overview of chapters

In addition to this introductory section, this thesis is comprised of three substantive chapters and a conclusion section. Below, I summarize the substantive chapters, identifying their main goal, analytical strategy and overall results.

1.4.1. Chapter 2: Exploring the prevalence of only-child fertility across the world

There is a vast literature detailing the fertility decline observed as countries go through their demographic transition, and the consequential changes in parity that accompany this process. As total fertility rate reaches below replacement level, much of the literature has focused on understanding the causes and consequences of childlessness, however, similar attention has not been given to one-child fertility. Much is still unknown about this fertility outcome, including how it has changed over time across different contexts. This first substantive chapter tackles this gap in the literature by providing a descriptive look at the prevalence of only-child fertility across 125 countries over part of the 20th century.

By combining data from four main sources, this first analysis explores the trends in only-child fertility from the mother's perspective and how they relate to overall fertility

trends. With the use of a fixed effects model, the analysis explores how much can overall fertility (represented by cohort fertility rates and mean ages at childbearing) predict the prevalence of only-child fertility.

The results show, as was expected, that the prevalence of only-children has increased for most of the world, following their fertility rate decline. However, as countries reach below replacement fertility, larger heterogeneity becomes apparent. This is especially noticeable for Europe, where certain countries present a high prevalence of childlessness and low prevalence of only-children, or vice-versa.

The chapter concludes with a discussion of these results, and what they signify within the larger context of fertility behaviours, the demographic and fertility transitions, and gaps and limitations for further study. Overall, the chapter serves as an introduction to the topic of only-child fertility, which is further developed in the other two substantive chapters.

1.4.2. Chapter 3: Fertility intentions and outcomes in Eastern and Western Europe

As highlighted in Chapter 2, as countries reach below replacement fertility, there's a noticeable heterogeneity in the prevalence of women with no children and one child at the end of their reproductive period. One of the possible reasons for this divergence are differences in fertility intentions. Another possibility is that people are unable to reach their desired number of children due to socioeconomic or cultural barriers.

Guided by the Theory of Planned Behaviour (TPB), this chapter aims to identify the factors affecting fertility intentions and outcomes for a first and second child in low-fertility European contexts. The TPB assumes that fertility behaviour is guided by a person's subjective (social) norms, attitudes and perceived control over having children. That is to say, what their family and peers think about them having children, how having

a child would affect their live (positively and negatively) and if they believe they have the means to have and raise a child.

With the use the first two waves of the Generations and Gender Survey (GGS), this chapter looks at men's and women's intentions to have a child in the next three years and whether or not they realise those intentions three years later. This is done with a sample-selection probit model. To explore differences between Eastern and Western Europe, observed during Chapter 2 and during preliminary descriptive analyses, the models are run separately for each region, as well as for those having a first and second child. Two countries were chosen to represent each region: Russia and Bulgaria representing Eastern Europe, and France and Austria representing Western Europe.

Countries in Eastern Europe present a high prevalence of only-child fertility and low prevalence of childlessness, while those in Western Europe present much more similar prevalences between the two parities, which could indicate diverging intentions between the regions. The results of the analysis of fertility intentions show that subjective norms have a strong positive effect, especially for Eastern Europe. However, when it comes to the realisation of those intentions, people's perceived control had the strongest effect. This indicates that while people may feel social pressure to have a child and fit into the stablished social norms, they will not realise those intentions if they do not feel secure in their ability to raise that child. The chapter further discusses the differences between the regions and between parities, and highlights how realised and unrealised fertility intentions relate to the observed prevalences of only-child fertility in Europe and other similar low-fertility contexts.

1.4.3. Chapter 4: Behaviour of only-children and children with siblings in the UK

The first two substantive chapters look at only-child fertility from the parent's perspectives. This final substantive chapter will focus on the children themselves and explore the possible behaviour consequences of being an only-child.

Negative stereotypes about only-children's behaviours are common across most societies in the world. One of the reasons why fertility intentions for an only-child may not be more widespread, even in low-fertility contexts, seems to be that parents are afraid of the effects of depriving a child of a sibling (Falbo, 1979; Laybourn, 1990).

Previous literature on this topic seems to contradict these stereotypes, and some have even found that only-children usually perform better than their peers in certain behaviour and academic areas (Falbo, 2020; Mancillas, 2006; Polit et al., 1980). However, there are still gaps in our understanding of this topic. First, most of the studies are focused on early childhood, and uses data solely from the United States or China. In addition, a lot of the literature uses small samples, or focuses on older birth cohorts. Therefore, it is possible that behaviour differences may exist in other contexts, or that things have changed over time.

With that in mind, this chapter explores the behaviour differences between only-children and children with siblings from ages 3 to 14 in the United Kingdom, with a series of logistic models with data from the 2000's Millennium Cohort (MCS). The behaviours, which are based on the child's mother's assessment, are based on the Strengths and Difficulties Questionnaire, and measure the child's score on five scales: emotional, conduct, hyperactivity, peer-relations and prosocial behaviour. This chapter contributes to the literature by providing an analysis with country-representative data, for a population that hasn't received as much attention in this particular literature.

The results show that only-children present higher chance of having abnormal peer behaviours, but fared better than children with siblings when considering conduct

and pro-social scores. These differences in behaviour between only-children and children with siblings persist as children get older. However, the conduct score advantage for only-children disappears when only firstborns or only children with a resident father are considered.

Chapter 2

The prevalence of mothers of only-children across the world: variations over the course of the demographic transition[1]

2.1. Introduction

An important consequence of the fertility decline that accompanies the demographic transition is a reduction in average family sizes. In developed countries, and much of the developing world, a two-child family seems to have become "the norm" (Adam, 1991; David & Sanderson, 1987; Frejka, 2008; Prskawetz, 2007; Sobotka & Beaujouan, 2014). As fertility falls below replacement, however, it becomes increasingly clear that more and more women are finishing their reproductive period with one child or no children at all.

While childless women have drawn increasing academic attention over recent decades (Dykstra & Wagner, 2007; Kreyenfeld & Konietzka, 2017; Mosher & Bacharach, 1982; Rowland, 2007), women with one child – which I will refer to as one child mothers or mothers of only-children[2] – have not received the same level of attention. We lack even basic descriptive trends and cross-country comparisons about this fertility outcome, especially when it comes the global south.

In this chapter, I address this topic by providing a comparable global overview of the trends in only-child female fertility. First, I present the prevalence of women who

[1] This chapter is based on a shorter paper, co-authored with Christiaan Monden, currently under review at Demographic Research.

[2] There is no consensus on a term to refer to women who end their reproductive period with a single biological child. The demographic and sociological literature uses terms such as "mother of an only-child", "one child mother" or "only-child family", whereas the medical (obstetrics) literature refers to "uniparous women". Whether and how to acknowledge stillbirths, abortions, or putting a child up for adoption, further complicates the exact meaning and comparability of these terms. In this study, we use the terms one-child and only-child mothers interchangeably to refer to the situation where a women reports one life-born child or a single adoptive child and no further life-born children. We want to emphasize that a woman who has experienced a stillbirth is very much the mother of that child too; "only" or "one" refers primarily to the living child growing up without a second living sibling by their mother.

finish their reproductive period with one child, for 125 countries, for women born between 1920-29 and 1970-79. I then explore their distribution among the higher and lower educated women. Finally, I explore the relationship between these trends and the trends in overall fertility decline. To allow for a contextualisation of the only-child fertility into the broader fertility context, I also look at how the prevalence of mother of only-children relates to the overall fertility transition as observed by cohort fertility rates.

Understanding only-child families is both sociologically and demographically interesting. From a sociological perspective, the number of children a person has affects their life in many domains: from physical and mental health (Bernardi et al., 2019; Tosi & Grundy, 2018), to economic well-being (Doren, 2019) and financial outcomes (Semyonov & Lewin-Epstein, 2013). Demographically speaking, an increase in only-child fertility could lead to less uncles, cousins and extended relatives as a whole, which will contribute to a continued decrease of family size and possibly complexity, as nuclear families could become even more prevalent. In addition, what once might have been a homogeneous group, could now become more heterogeneous, as the pathways that lead to becoming the parent of an only-child might be expanding (health or economic reasons, personal choice etc.). Finally, an increase in only-children will also affect the redistribution of resources between generations, which could have important consequences for social mobility, health and socioeconomic development.

If more women are finishing their reproductive period with one child, it becomes increasingly important, from a policy as well as pure scientific perspective, to understand how fast these trends are changing, and whether they are universal or only happening in certain countries or among certain population subgroups. If only-child fertility is only growing among higher educated women, for example, their consequences for the future will be different than if they are equally distributed among all women, as these women

have unequal access to resources to deal with the benefits and costs of having an only-child.

The results of this chapter discuss the within and between heterogeneity in trends across the four major geographical regions: The Americas, Europe, Asia/Oceania and Africa. This global perspective, while it doesn't permit for a look at country trends in detail, allows for the exploration of patterns and similarities across different societies.

Finally, having more information about the trends in only-child fertility can give us a better understanding of the changes in overall fertility patterns. Especially as more countries record below-replacement fertility levels, it is important to know to what extent this is driven by a high prevalence of childlessness or only-child fertility, which are two very different outcomes when considering their socioeconomic and demographic impacts. Moreover, this study adds to the growing body of research debating the convergence or divergence of fertility patterns over the demographic transition (Dorius, 2008; Kuijsten, 1996; Pesando & GFC team, 2019; Timæus & Moultrie, 2020), as it allows us to see if only-child fertility is homogeneous across countries, following the same overall pathway towards fertility decline.

2.2. Declining fertility and the prevalence of women with an only-child

The literature has proposed a host of explanations for fertility decline. Five of the general drivers of low fertility can be seen as drivers of only-child fertility as well: (i) health limitations, (ii) fertility postponement, (iii) relationship breakdown, (iv) socioeconomic considerations, and (v) family size preferences (Alesina & Giuliano, 2007; Bryant, 2007; Caldwell, 1980; Caldwell & Schindlmayr, 2003; Schultz, 2001).

Health problems that impede childbearing, such as infertility, are an important reason why women would have fewer children than they had desired or may had originally planned (Frank, 1983; Shreffler et al., 2016). Similarly, when women postpone

their first birth — or a desired second birth — to older ages, it becomes more difficult to bear a second child (Beaujouan, 2020; Morgan, 1991; Sobotka & Beaujouan, 2014).

Although childbearing outside of unions is becoming more accepted, most women still have children within a union (Perelli-Harris & Gerber, 2011). Therefore, relationship breakdown due to divorce and separation (or widowhood, in low-income countries especially) can deter women from having any further children. Increasing divorces rates could be leading to situations where women who had one child and intended to have more are not able to do so due to the lack of a suitable partner, especially when it becomes more acceptable for parents with a young child to divorce. At the same time, the increase in trends of remarriage could be leading women to have more children than initially planned due to the pressure of having a child with the new partner (Wineberg, 1990), although there are also studies that show the opposite can be true (Thornton, 1978). Therefore, the exact effect of relationship breakdown on fertility could depend on specific cultural norms.

When thinking about a conscious choice to have an only-child, it is possible that some women have a preference for smaller families, in the same way some women may chose to remain childless or have a large family. This is facilitated in more socioeconomically developed societies through access to contraceptives and by women having higher autonomy for family planning, including decision-making power within a couple. However, socioeconomic considerations may lead to the decision to have a single child for other reasons. Raising an only-child is less financially costly than having more children; more children could simply be deemed unaffordable (given the expectations of what parents should provide for).

Furthermore, having a single child means that parents can allocate all their resources to this child (Parr, 2007). They might want to give their child an advantage over

children of the same socioeconomic group who have to share their resources among their siblings (Gietel-Basten & Rajbhar, 2018; Pradhan & Sekher, 2014). An only-child could also be beneficial for women who want to dedicate themselves to their career while also choosing motherhood (Elizarov & Levin, 2015). Lack of affordable and easily accessible childcare can also deter women from having more children. The lack of proper infrastructure can lead to postponement regardless of the norms for age of parenthood, ultimately leading couples to not reach their desired family size (Greulich et al. 2017; Van Bavel and Nitsche 2013).

Similarly, Van Bavel and Rózańska-Putek (2016) show that having personal economic uncertainty in a macro-context of generally good economic conditions will lead to lower second birth rates, but this appeared to be the other way around in poorer regions. However, subjective economic uncertainty was still important in places that attach a high value to parenthood, as people who have already reached the status of parents do not have to risk the financial burden of a second child, as one child is enough to fit within the social norms.

The social acceptance of the only-child outcome is also an important determinant of its prevalence. An increase in women with an only-child could indicate that only-children have become more culturally accepted and possibly even desired by certain groups, as society's views on the role of children, parenthood and the family have shifted. However, there is still very little evidence that only-children are a conscious positive choice by women who want children, as most seem to follow the two-child norm at least partially due to negative stereotypes propagated about only-children (Blake, 1981; Elizarov & Levin, 2015; Goldstein et al., 2003; Greulich et al., 2017; Mancillas, 2006; Sobotka & Beaujouan, 2014).

Blake (1981) argues that over the course of human history, the families that survived were the ones with a stronger pro-natalist sentiments, creating a prejudice against only-children. This last explanation is also hypothesised by Sobotka and Beaujouan (2014) when trying to explain the persistence of the two-child norm in Europe.

Even today, there are prevalent negative stereotypes about being an only-child, such as being spoiled, selfish, lonely, or in some way maladjusted. These have persisted over time even when studies have shown a lack of empirical evidence for them (Blake, 1981, 1989; Falbo, 1982; Falbo & Polit, 1986, p. 86; Laybourn, 1990, 1994; Shen & Yuan, 1999; Veenhoven & Verkuyten, 1989). As discussed by Jefferies (2001), these stereotypes pressure parents into having a second child not only because of their fear of their child growing up with these problems, but also due to fear of being considered selfish for putting their child in that condition.

Another important factor to consider is the parent's own siblingship size, as the "one child model" has been shown to be transmitted from one generation to the next, and being an only-child increases your chances of wanting a single child as well (Breton & Prioux, 2009; Buhr et al., 2018).

2.3. Regional pathways to one-child fertility

All of these underlying drivers of only-child fertility highlight the fact that, as is the case with the fertility transition, we may see different pathways to one-child families in different contexts. Most notably, China exemplifies a case where the increase in only-children was policy induced. While fertility decline was already underway before the one-child policy was put into place (Zhang, 2017), this process was drastically influenced by the penalties incurred by having more than one child.

In contexts of low fertility, such as in Europe, we may see women who do not fit into the two-child norm and end up with an only-child either due to cultural preferences,

or due to socioeconomic barriers preventing them from advancing to the next parity. At the same time, in post-socialist countries, voluntary childlessness is still rarely accepted (Beaujouan et al., 2016), so it is also possible that women who didn't necessary want children or a big family, end up having one child to fit in with the social pressure of having children. At later stages of the demographic transition, we might see much more variation in the prevalence of women with only-children across countries when compared to early stages, as their prevalence would be more tied to cultural and social factors instead of overall fertility levels.

In countries still at earlier stages of their fertility transition, such as in Sub-Saharan Africa, the pathways to having an only-child might be better explained by health and infertility factors, which prevent women from reaching their desired fertility. Here, it is important to highlight that there is an overall lack of research on this subject in the global south. In Africa, there have been studies focusing on involuntary childlessness (Ibisomi & Mudege, 2014; Olamijuwon et al., 2021), but not enough research on women who, voluntarily or not, have only a single child. This is partially due to lack of data and partially because desired family sizes in Africa are generally larger (Bongaarts, 2011; Casterline & Agyei-Mensah, 2017), indicating only-children to be rarer. Lerch and Spoorenberg (2017), by estimating parity progression ratios, indicate an above 90% transition to higher parities in a large majority of African countries from 1965-2010. However, even as fertility in Africa remains high, birth intervals are increasing – albeit following a different pattern from other countries in the past (Lerch & Spoorenberg, 2017; Moultrie et al., 2012; Timæus & Moultrie, 2020) – which may contribute to stronger fertility decline in the next decades.

In Latin America, we notice a similar lack of studies that focus on the only-child. Some insights can again be gathered by looking at parity progression ratios (PPR). Lima

et al. (2018) reconstruct the PPRs for 12 Latin American countries over the 20th century, showing a PPR from 0 to 1 and from 1 to 2 close to or above 85%, with Argentina and Uruguay being the biggest outliers. However, as these countries continue their fast-paced trajectory over their fertility transitions, most countries now have reached below replacement fertility levels (Rosero-Bixby et al., 2009). Latin America is also a region with a lot of socioeconomic inequality, and is possible that these overall fertility trends hide heterogeneity in fertility behaviours within the population. Therefore, even within one region, we may see different drivers and pathways to an increase in only-child fertility.

In Asia, strong sex preferences can be highlighted as a factor that may indirectly contribute to fertility decline and an increase in only-children. In India, for example, technological advancements that have allowed parents to determine the sex of the child before birth also allow couples to perform selective abortions and couples do not need to have multiple children to achieve the desired male child (Kashyap, 2017; Pradhan & Sekher, 2014). For the case of India, Gietel-Basten and Rajbhar (2018) indicate a growing ideation of only-children in the country, especially for the urban families of higher social class.

Therefore, while I compare cohorts of mothers of only-children across the world, it is important to keep in mind that these women may represent different socioeconomic and demographic groups depending on their geographical context. While all the different pathways to one-child fertility discussed previously will likely exist in all regions, they may present differently for each context. For example, health limitations and lack of access to contraceptives may be more important drivers in low-income regions, while the economic costs of having a second child may have the biggest impact in high-income regions.

2.4. Guiding hypothesis

Taking the above-mentioned literature into consideration, I hypothesise how the trends in only-child fertility would present for each region over time. The different birth cohorts in the analysis represent different overall fertility levels for on each region, and comparing the trends across regions for each birth cohort provides a metric for understanding how the global prevalence of only-child fertility has changed over time. However, we cannot directly compare different cohorts for different regions, as they represent different stages of the demographic transition (For example, the 1920 birth cohort for Europe is not directly comparable to the 1970 birth cohort in the Americas, despite them presenting similar overall fertility levels). Therefore, the focus of the analysis is on the regional variations in only-child fertility as their fertility changes across cohorts.

With that in mind, I expect that:

H1. The share of women with only-children will increase as a country advances through their demographic transition, parallel to their overall fertility decline.

H2. In above-replacement fertility settings, countries in the same geographical region will present similar trends over time (across birth cohorts) due to similar timing in their transition, and similarities and culture and socioeconomic contexts.

H3. The predictive power of cohort total fertility rates on the levels of only-child fertility will decrease as fertility reaches replacement level and especially as it falls below replacement.

Of course, these are guiding hypothesis to help steer the analysis. This study is not looking to predict future pathways of fertility, but to document, first, the prevalence levels of only-child fertility at a global level and their trends over time and, second, to initiate a discussion on how much these trends can be seen as hetero/homogeneous across

the demographic transition. The Demographic Transition Theory, while very relevant for demographic studies, is also very broad and does not account for all the different pathways that countries can follow to achieve low levels of fertility and mortality. In the same way, the increase in only-child fertility can also be shown to be very heterogeneous, despite common trends.

2.5. Data and Methods

2.5.1. Datasets

Since my goal is to map out the trends in only-child fertility over time, I looked for compatible data sources that would cover the largest number of countries. With the available data[3], I was able to construct the trends of only-child fertility for 125 countries (Figure 2.1, see full list of countries in Appendix A),

The countries were grouped into four major geographical regions[4]: Africa, Americas, Europe and Asia/Oceania, as classified by the United Nations (UN M49 classification[5]). Most of the analysis done will be restricted between the 1930–39 to the 1960-69 birth cohorts, as there are a lot of countries missing from the earlier and later cohorts, especially in Europe.

The main data source for this research were household censuses. Data for 67 countries was drawn from the Integrated Public Use Microdata Series International

[3] We made the decision to include as many countries as possible while also limiting the number of data sources in the analysis to facilitate harmonization, comparability and future replication of the results. This means we are missing certain countries, such as the United Kingdom or Australia. Opening an exception to certain countries would mean opening it for others, which would not only require more time dedicated to finding and harmonizing several smaller surveys, but would also make the results more cumbersome to replicate.

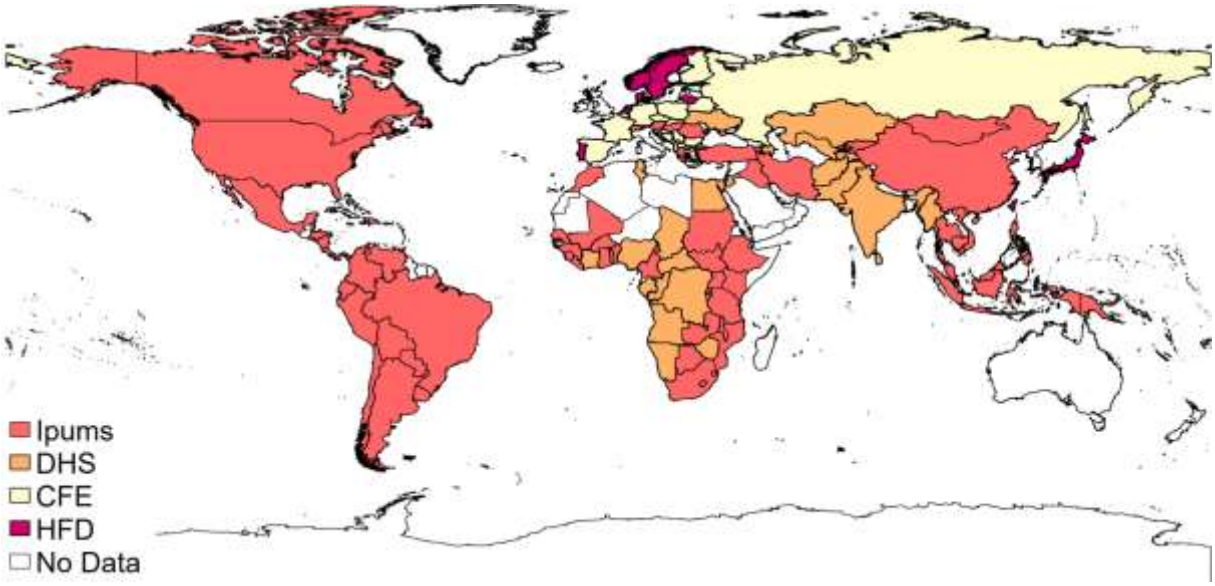
[4] To verify whether or not regional groupings made sense, a second approach to grouping these countries was done with the use of k-means clustering, based only on the shape and level of the country trends. This approach showed that most countries where grouped with countries of the same region. This is not to say that there aren't outliers, as we will show in the results, however we decided to keep regional groupings for our analysis, as these also make sense from a cultural and history likeness perspective.

[5] The UN M49 code can be found at: https://unstats.un.org/unsd/methodology/m49/

(IPUMS-I). For most developing countries, censuses are the best source of information on family and fertility, with several waves available. All censuses available from 1960 onwards that had the question on number of children were considered for this analysis.

Unfortunately, many European countries are not covered by IPUMS data or their censuses do not have the necessary information on fertility. Therefore, a few other data sources were used as a complement. The information for 19 countries was taken from the Cohort Fertility and Educational Database (CFE), which pulls data from several sources (censuses and large-scale surveys) to construct information on completed cohort fertility and parity distribution by education for several countries, covering women (and men when possible), from ages of 40 to 79. Moreover, data for 30 countries was taken from the Demographic Health Survey (DHS), and for 8 countries from the Human Fertility Database (HFD).

Figure 2.1 Map of countries included in the analysis by data source



Source: created by the author

For this study, "mothers of only-children" are defined as women 40 to 59 years old who have one child born alive (including adopted children). Women younger than 40 are not included in the analysis as they might still have a second child before competing their reproductive period[6]. The upper age limit was set to 59 because, in some countries, there could be a significant impact of mortality that could be selective towards a certain parity, affecting our measures. This selective mortality by parity would most likely affect women with both very high and very low parities (Barclay & Kolk, 2019; Högnäs et al., 2017).

Working within the possibilities of large-scale cross-nationally comparable data, I consider only-child fertility only from the mother's perspective. Although correlated, the proportion of women with an only-child doesn't necessarily translate to the proportion of children without siblings (Lam & Marteleto, 2013).

Looking solely at the mother's fertility leads to some limitations. Firstly, the data does not account for stepchildren. Therefore, if a woman who only has one child remarries someone who also has a child/children, she might effectively become a mother of more children, as a step-mother. This might impact her in the same way as having more children of her own in terms of responsibilities to caring for the extra children. Therefore, some of our results might be overestimating the prevalence of "mothers of only-children" in these scenarios.

Moreover, in countries where polygamy is practiced – or more precisely polygyny, where a single husband has multiple wives – a woman may help raise multiple children who are not biologically hers, independently of how many children she herself

[6] I tested this cut-off point with IPUMS data. Considering that women who had a child after 40 would still have their youngest child living in the household between ages 40 and 49. The average percentage of women with two children who had a second child from ages 40 to 49 among all women with two children was around 2.6% in 1920, and declining for the younger cohorts.

had, creating an added layer of complexity to the family dynamics. While the prevalence of polygamy has been diminishing in the last few decades, it is still relevant in many African countries in the cohorts of this study (Fenske, 2015).

Not considering the father's fertility leads to inconsistencies between the prevalence of mothers of only-children and prevalence of only-children themselves. One could argue that a child with no siblings from their mother's side would have most likely grown up without any other children in the household and could be considered an only-child even if we do not know the father's fertility. However, as remarriages become more common, we could see an increase in the number of "only-children" who sharing a household with a step or half sibling. Moreover, in contexts where polygamy or extended households are more common, it is also likely that a child without siblings would have grown up without the "only-child experience", sharing the household with other children, such as cousins. Due to the nature of our data, the focus is on mothers of only-children and not on the only-child themselves.

2.5.2. Analytical strategy

Firstly, I calculate the proportion of women in 10-year birth cohorts who had a single child, creating the share of women who have an only-child for each country and region. Because the group of analysis is women 40–59 years old, it is possible to calculate two 10-year birth cohorts from each census. For example, in the 1970 census, we have women born 1910–19 and 1920–29 who are 40–59 years old in the date of the census. For certain countries, the question on fertility was only asked of women up to age 50. In those cases, only one 10 year birth cohort could be constructed for each census. In other cases (in certain waves of the censuses), the question was also only asked of married women. Those countries were kept in the analysis because, in their cases (either for the

country of for those specific years), most women do eventually get married and extra-marital fertility is expected to be very low, especially for the cohorts analysed.

To explore these trends in more detail I also calculate the average proportion of mothers of only-children by educational attainment. The measure of mother's education was re-coded for the purpose of this study into a binary variable of primary education or lower vs more than primary. This somewhat simplistic division was chosen to allow for harmonization between the different countries, as well as because more than two educational groups would create too many small subsamples for certain cohort and country combinations. Examples for selected European countries with three educational categories can be seen in Appendix A.

Not all countries were included in this education analysis. Firstly, data from the HFD does not include information on education, so the countries from that dataset could not be included. In addition, even with the binary education re-code, many African and some Asian countries still had a very low number of women with more than primary education, and especially among those with only-children, which is already a small sample size. Therefore, countries with less than 100 cases in any education category were not included. All of these restrictions reduced the sample to 59 countries. While this reduces the geographical cover of the educational analysis, we are still able to observe some interesting regional trends, especially for Europe and the Americas.

I also briefly compare the trends in only-child fertility and childlessness, where the trends in childlessness are calculated in analogous form to the trends in only-child fertility.

Finally, I explore the predictive power of the changes in overall fertility to the prevalence of mothers of only-children. To achieve this, a counterfactual scenario was created, where this prevalence was predicted, using a country and cohort fixed effects

model for each region based only on the Cohort Fertility Rate (CFR) and the mean age at childbearing (MAC) for each cohort. This is only a small part of the analysis, however, and most of the results will be done with more descriptive methods.

The CFR was constructed based on the information of number of children born alive from the mothers in the analysis (aged 40 to 59), by dividing the total number of children by the total number of women in each birth cohort. The mean age at childbearing was taken from the United Nations estimates and lagged by 20 years to match the birth cohorts. For example the information for the period of 1950–59 (the earliest available) was matched to the birth cohort of 1930–39 and so on.

With the information on CFR and mean age at childbearing, the predicted prevalence of women with an only-child is calculated based on the coefficients from these two independent variables from a fixed effects model (presented in Equation 2.1), that included all cohorts from 1930–39 to 1970–79, with the proportion of women with an only-child as the dependent variable. A separate model was run for each of the four regions due of the great variation in the fertility levels between regions, so it is assumed that effect on the only-child fertility varies between regions. The inclusion of both country and cohort fixed effects is to account for unobserved time invariant country heterogeneity and country invariant cohort events.

$$PP_{it} = \beta_0 + \beta_1 CFR_{it} + \beta_2 MAC_{it} + \alpha_i + \gamma_t + \varepsilon_{it} \quad \text{(Equation 2.1)}$$

Where *PPit*, *CFRit* and *MACit* represent the predicted prevalence of women with an only-child, the cohort fertility rate, and mean age at childbearing in country *i* and cohort *t*, respectively. The time fixed effect is represented by γt, and αi is the country fixed effect. $\beta 1$ and $\beta 2$ represent the regression coefficients, $\beta 0$ is the intercept, and εit is the error term.

The differences between the predicted and observed prevalences indicate the impact of unobserved factors on the prevalence of only-child fertility, such as socioeconomic or cultural factors. Large residuals for these models indicate that fertility alone cannot dictate the prevalence of only-child fertility for a population. It is possible that these other factors are either acting in the opposite direction of fertility changes or compounding the fertility effects, leading to over or underestimations of only-child prevalences.

2.6. Results

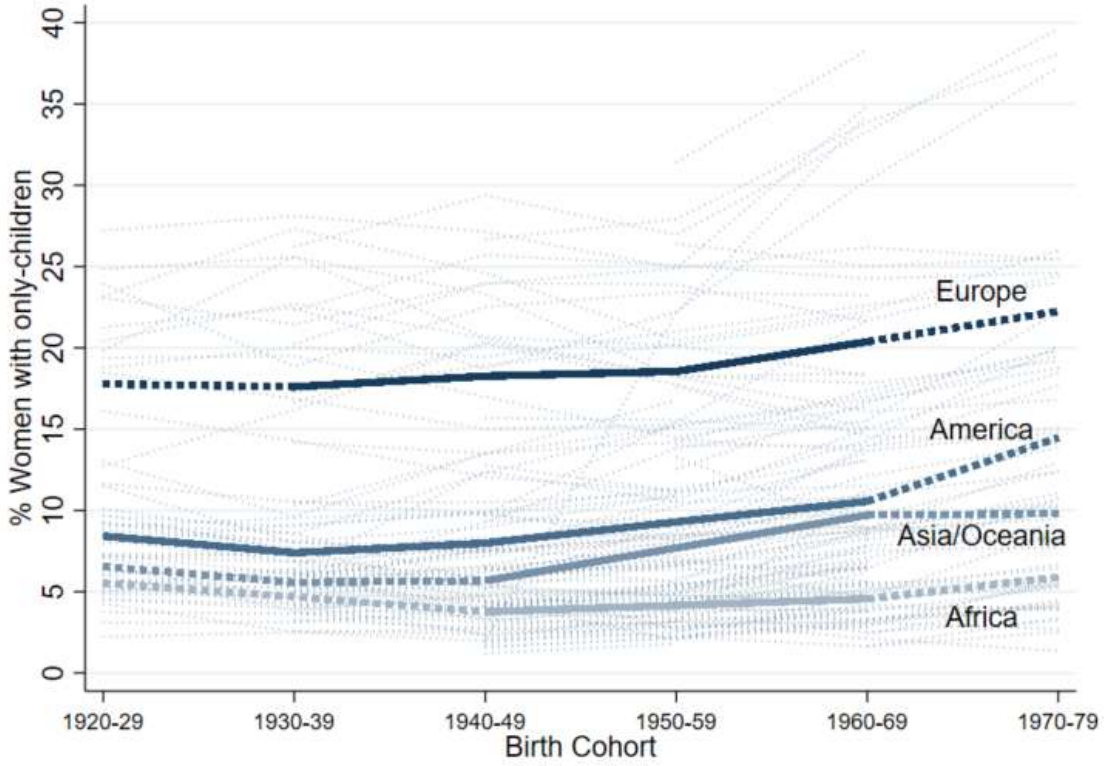
2.6.1. Only-child fertility: Global trends

Figure 2.2 shows the trends in the percentage of women with an only-child for the countries in this study (in the background), with the average of the main geographical regions highlighted. The results shows that Europe has had a much higher level than the other regions across the cohorts, while Africa was and remains the region with the lowest share of women with one child. The overall global pattern is of an increase, as expected (hypothesis 1) and all regions present an increasing trend from the 1940–49 cohort onwards.

Europe starts with 17.8% of women with an only-child in the birth cohort of 1920–29 — more than double than any other region. The subsequent cohorts presented a steady growth, reaching 20.4% in 1960-69 cohort, and 22.2% in the 1970–79 cohort. Europe is the most heterogeneous region, and Albania stands out with a much lower prevalence than most other European countries. Romania, Belarus, Russia, Portugal and Spain, on the other hand, present a much faster growing trend and higher prevalence than other countries, despite similar fertility rates – as it will be shown later in this section.

Only Europe, on average, shows a constant increase over all cohorts. For the other regions, the increase is observed later: from 1930–39 (Asia/Oceania and America) or 1940–49 (Africa) cohorts onwards.

Figure 2.2 Proportion of women with only-children by geographical region and birth cohort of the mother



Note: For the earlier and later cohorts, presented with the dashed lines, not all countries are present due to lack of data.

Source: data from IPUMS-I, CFE, HFD and DHS.

The Americas went from 8.4% to 14.5%, with the increase starting with the 1930-39s birth cohort. The women from this cohort would enter reproductive age around the 1945–55s, around the time that countries in the region would be experiencing the start of their fertility decline. In the Americas, most countries present a rapid growing trend. However, Argentina and Uruguay show a declining trend over the cohorts (with Uruguay showing a recovery in the latest cohort). These countries are interesting cases because they went through their demographic transition a lot earlier than other countries in the

region. Therefore, the 1920–29 birth cohorts already presented fertility rates close to 2, when the rest of the region was closer to 5. This explains the high rates of women with only-children in the earlier cohorts. However, the fertility rates remained low and the prevalence of only-child fertility actually started to decrease over the cohorts.

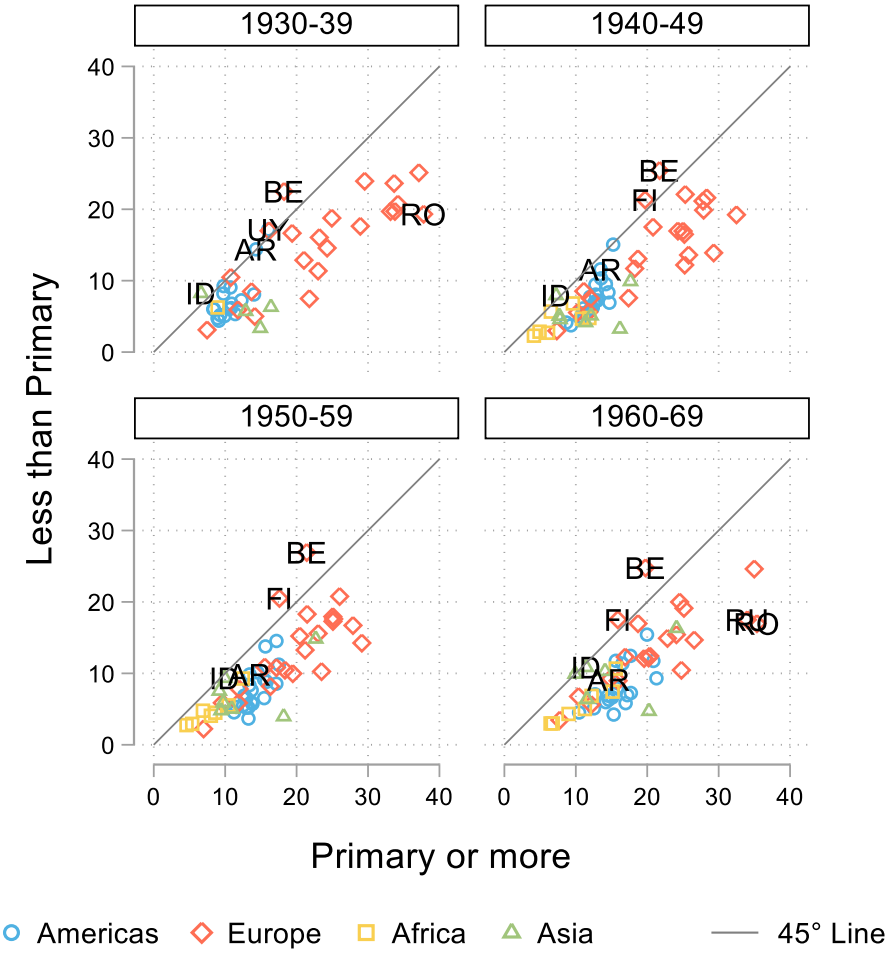
For Asia and Oceania, considering only the cohorts with a steady number of countries, the region's percentages grew from 5.8% to 8.5% between the 1940–49 and the 1960–69 birth cohorts, when excluding China. In China alone, the percentage of mothers of only-children went from a very low 4.2% from the 1920–29 cohort, to 34.3% in the 1960–69 cohort due to the implementation of the one-child policy.

In Africa, the average has been consistently the lowest between the four regions and has been relatively constant at this low level, staying around 4%, with a very slight increase between the 1940–49 and the 1960–69 birth cohorts. From the 1930–39/40–49 cohorts onwards, the gap between Africa and the other three regions has becoming larger as the level in Africa has remained fairly stable while other regions have seen increases. As outliers, South Africa and Botswana actually present substantial increases over the period.

The impact of only-child fertility is tied not only to its overall prevalences, but also to the variances between subgroups. To explore some of these possible variations, Figure 2.3 presents a comparison of the prevalence of one-child fertility between women with less than primary education or more than primary education, for 1930-39 to 1960-69 birth cohorts across the four main regions.

In accordance to the literature, mothers of only-children makeup a larger share of the higher educated group than the lower educated group for most countries: if the prevalence was similar between the two groups, all the points in the figure would be around the 45° line.

Figure 2.3 Trends in the proportion of women with only-children among women with less than primary education and primary of more, by geographical region and birth cohort of the mother



Notes: 1) country labels: BE Belgium; RO Romania; RU Russia; UY Uruguay; AR Argentina; ID Indonesia; FI Finland. 2) The earlier and later cohort (1920 and 1970) where not included in the analysis due to the smaller number of countries who have data points in for these cohorts.

Source: data from IPUMS-I, CFE, and DHS.

While the patterns are similar across regions, it is possible that the drivers behind the observed trends vary between contexts. As previously discussed, there are different possible pathways to one-child families and different factors may be influencing these women's parity outcomes. The lower fertility among higher educated women may be because these women are focusing on their studies and careers, and either have lower parity intentions or are not be able to fulfil their intentions due to childbearing

postponement. This could be the case for women in all regions. However, in developing countries, especially for these cohorts, access and use of contraceptives are also an important factor to consider as to why there's a gap between the lower and higher educated when considering only-child fertility, as higher educated women may be able to better control their fertility (Bongaarts, 2011).

In Europe, the biggest gap between educational groups is amongst Eastern European countries (such as Romania, Russia). The larger discrepancies between lower and higher educated prevalences in Eastern Europe could indicate that higher educated women have a higher preference for only-children. They may also face stronger barriers for progressing to a second child (such as fertility postponement to pursue education), or they may present a stronger preference for childlessness, but end up having a single child due to strong social pressure to have children. Belgium and Finland stand out as having a larger share among lower educated women. This could be an indication that having an only-child in these contexts is an undesirable outcome, and the women having an only-child are also limited in achieving higher education due to possible health limitations.

China is a great outlier due to the circumstances that led to the increase in only-children in the country, as previously discussed, and is therefore not included in the figure. For the 1950-59 and 1960-69 birth cohorts, the prevalence of only-children increases drastically for both groups, but especially for the higher educated women, reaching 66% of higher educated women, compared to 24% of lower educated women. This discrepancy may have to do with an urban/rural divide, as overtime the policy allowed for some exceptions including one in which rural parents were allowed to have a second child if their first was a daughter (Li & Cooney, 1993).

When comparing the cohorts, the gap between higher and lower educated women is stable over time: the relative difference in prevalence between lower and higher

educated women between cohorts for most countries is around zero, which means that prevalence for both educational groups grew (or shrunk) at similar rates across cohorts. Argentina and Uruguay are again outliers, where the proportion among higher educated women is stagnant over time, while the proportion among lower educated women is decreasing, leading to a divergence between groups. On the other end of the spectrum, Spain had very similar prevalences for both groups for the earlier cohort, and while the proportion increased for both, it increased faster for the higher educated. This is in line with previous findings on changes in the social gradient in sibship sizes across birth cohorts of children (Präg et al., 2018).

As discussed in section 2.5, these restricted educational categories were due to the small number of higher educated women for many of the cohorts in the analysis. For European countries, where broader categories are possible (less than primary, primary, secondary and higher education), we still notice that higher educated women present lower prevalences when compared to low and medium educated women (as presented in Appendix A).

2.6.2. Comparing trends in Childlessness and Only-child Fertility

To what extent is the prevalence of only-child fertility related to the prevalence of childlessness? From the point of view of overall fertility decline both of these fertility outcomes can be seen as either a consequence or a cause of low fertility. While there might be situations when the drivers for these two fertility outcomes overlap, this is not always necessarily the case.

In a scenario where women did not change their ultimate fertility intentions but did delay childbearing to higher ages — to facilitate education, union formation and career progression — we would expect both the prevalence of only-child fertility and childlessness to increase. The same could be said about restrictions related to health or

union breakdown. However, in a scenario where some women have specific preferences to remain childless or have children, trends in childlessness would move independently to the trends in only-child fertility.

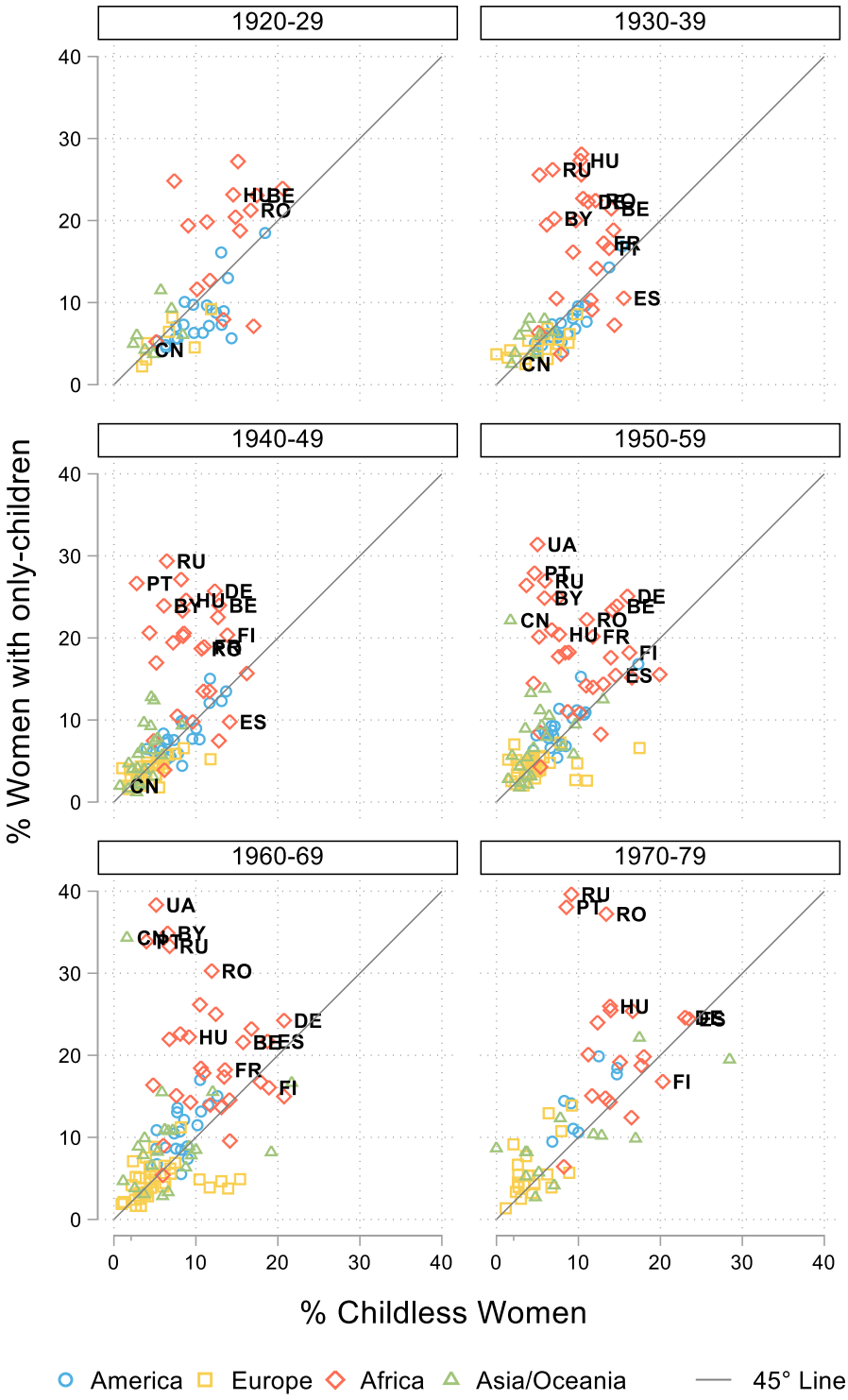
Obviously, overall fertility decline does not necessarily translate into a reduction in the number of children for all women in a population (Brée, 2017). Women from different socioeconomic backgrounds can be experiencing different stages of the demographic transition at the same time, with varying levels of fertility (Guerra et al., 2016). A total fertility rate of two children could mean that all women are having two children, or that some women are having many children and some are having none, and any combination in between. Therefore, countries with similar overall fertility trajectories may present very different patterns of childlessness and only-child fertility.

Figure 2.4a and 2.4b compare the prevalence of childlessness and only-child fertility from a (a) cohort and (b) regional perspective. The figures show that when both the prevalence of only-child fertility and childlessness is low, their relationship is quite linear, but as either surpass a prevalence of 10%, the relationship starts to vary considerably more. The biggest outliers to the pattern were Ukraine, Russia, Romania, Belarus, Portugal and China (although Portugal and Ukraine are not present for all cohorts), with a high proportion of only-child fertility and very low levels of childlessness.

Overall, we see that only-child fertility was already prevalent in some countries before childlessness was much relevant and, for most countries, childlessness started to catch up as countries continued their demographic transition.

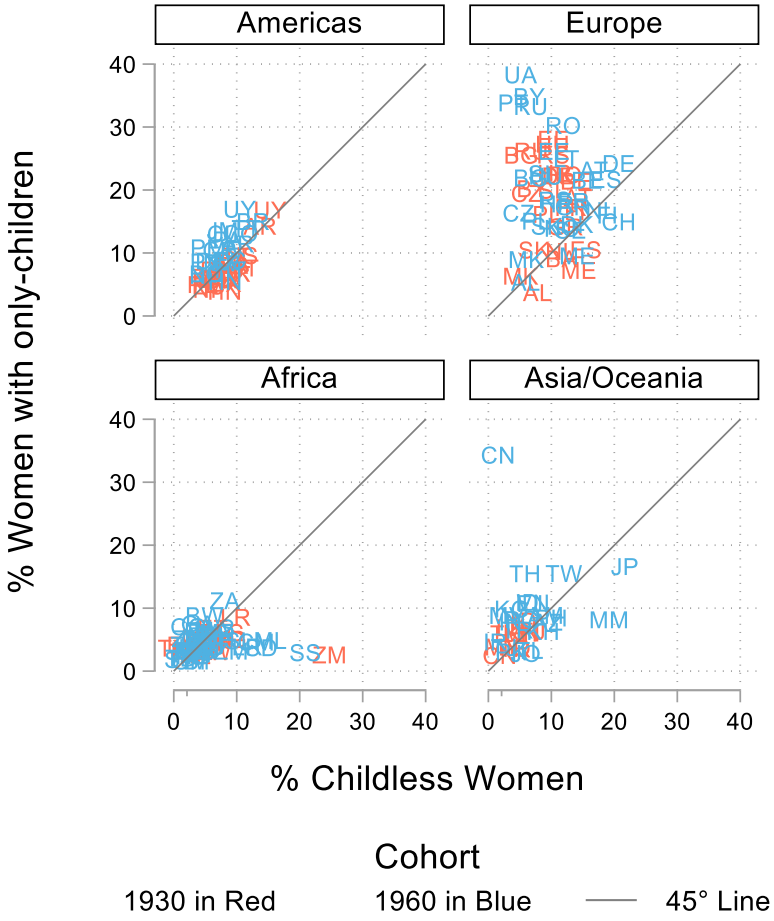
Figure 2.4 Trends in proportion of women with only-children and childless women by (a) birth cohort of the mother and (b) region

(a) Cohort View



Note: 1) country labels: UA Ukraine; RU Russia; RO Romania; BY Belarus; PT Portugal; CN China; ES Spain; FR France; BE Belgium; HU Hungary; FI Finland; DE Germany. 2) Zambia and South Sudan were removed due to small sample sizes

(b) Regional view, birth cohorts of 1930 and 1960



Note: 1) full list of country code labels can be found in Appendix A. 2) A figure by region with all cohorts can also be found in Appendix A. 3) The 1930-39 and 1960-69 birth cohorts were used in this figure as the 1920-29 and 1970-79 birth cohorts do not have points for all countries.

Source: data from IPUMS-I, CFE, HFD and DHS.

The regional view presented in figure 2.4b allows us to more clearly see regional changes over the cohorts: in the Americas, there is a clear shift across countries between 1930-1960 birth cohorts towards less childless women and more women with only-children. In Asia/Oceania and Africa, changes across cohorts are less visible, but with China (CN), Taiwan (TW) and Thailand (TH) standing out with an increase especially in the prevalence of women with only-children, and Japan (JP) and Myanmar (MM) towards childless women.

Europe, again, presents some heterogeneity. In Spain, both prevalences of childlessness and only-child fertility are high and growing. In France and Belgium, both trends are high and stable. In Germany, there is an increase in the prevalence of childless women, despite the lack of changes in the prevalence of only-child fertility, or much change in their cohort fertility trends in general. Finally, in Eastern Europe, both trends are growing, but only-child fertility is still more prevalent.

As briefly discussed by Breton and Prioux (2009), in countries where social pressure to have children is strong, as it seems to be the case in Central and Eastern Europe, women may feel the need to have at least one child, but those that are not much family oriented may stop at one, explaining the gap between childlessness and only-child fertility in these contexts. In countries where the social pressure to have children is not so strong, the women having none or one child may share similar characteristics and they may be compensating each other, so a rise in childlessness leads to a fall in women with only-children, as seen in Finland. That still leaves countries such as Hungary, Spain and France, where both types are high and might be rising. This could be connected to socioeconomic difficulties of raising children in these contexts (amidst an economic crisis, for example), which may lead women to postpone marriages and first births and, voluntarily or not, to finish their reproductive period with one or less children (Brée et al., 2017).

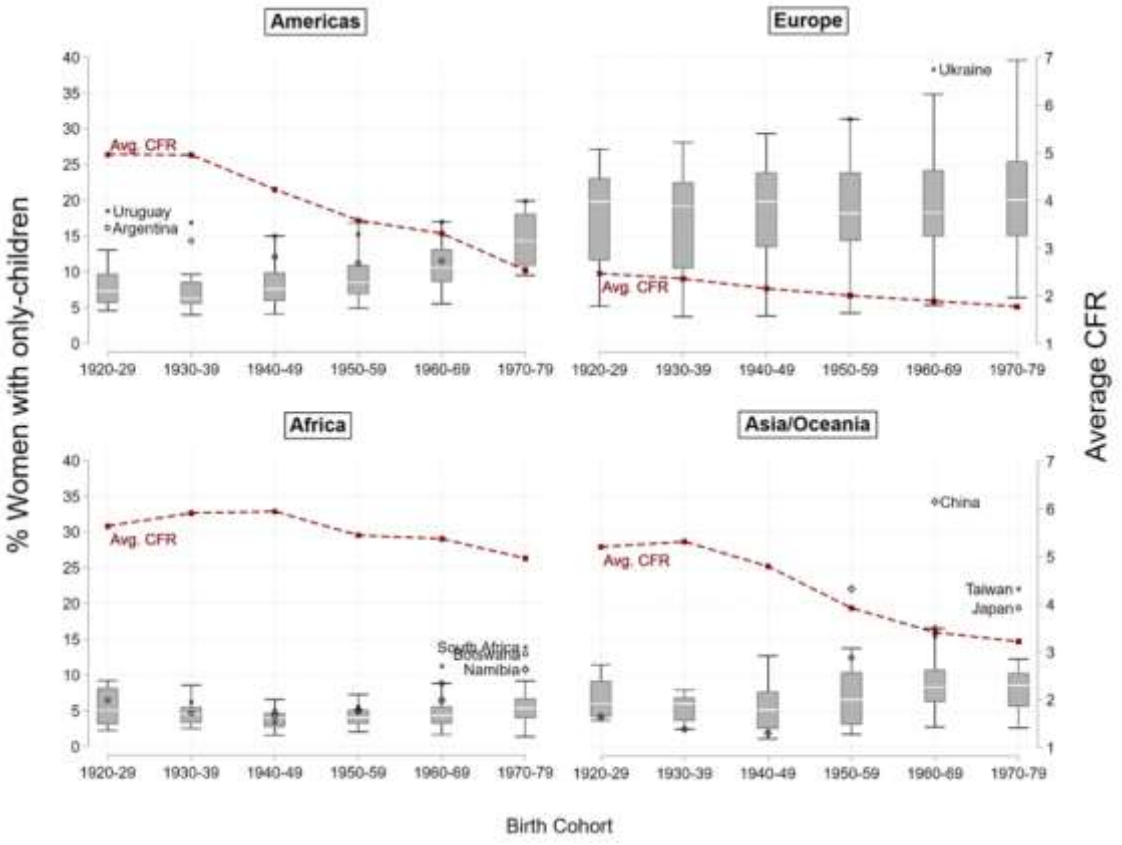
While there is still more that needs to be explored about this relationship, and how related are the motivations behind having an only-child or remaining childless in these countries, it is important to note that low fertility does not necessarily mean both a high proportion of childless and mothers of only-children, and neither does it mean one or the other.

2.6.3. General fertility decline and only-child fertility trends

According to the first and second guiding hypothesis of this study, it would be expected that country and regional trends of only-children fertility would be closely connected to the timing of the fertility decline in each country and region.

We can consider each of the four regions analysed here as representing different stages of the demographic transition. As shown in Figure 2.5, Europe has already reached low fertility with the 1920–29 birth cohort, and reaches below replacement with the 1970–79 cohort. Europe not only has the highest median prevalence, but also the greatest variation among its countries.

Figure 2.5 Within-region variation of the proportion of women with only-children and Cohort Fertility Rate by geographical region and birth cohort of the mother



Source: data from IPUMS-I, CFE, HFD and DHS.

While there is an increase in the median prevalence of mothers of only-children in Europe, this trend is much more pronounced in regions that have seen a bigger fertility decline, such as the Americas. In that region, the average CFR goes from around 5 to around 2.5, the initial CFR for Europe. The prevalence of mothers of only-children in the region, however, is not quite as high as the one seen initially for Europe.

Africa presents a modest decline in the CFR, but the prevalence of only-child fertility remains low. Asia/Oceania, as with the Americas, shows a great decline in the CFR, but a smaller increase in the prevalence of mothers of only-children.

With that in mind, how much of the increase in only-child fertility is directly related to fertility decline? If fertility decline completely dictated only-child fertility, we would expect all countries to present a similar prevalence as they go through their demographic transition with the same levels of overall fertility. Figure 2.6 shows that as the CFR approaches replacement level[7] (around 2.1 children per women), the strength of the relationship between overall fertility rates and the prevalence of mothers of only-children changes drastically. The correlation coefficients for above (ra) and bellow (rb) replacement fertility for each birth cohort (Table 2.1) show that this relationship is much stronger in above-replacement fertility contexts. And this relationship stays constant even if we only consider countries with data points in all cohorts considered or countries that have observations in the 1970s birth cohort (see Appendix A).

While there is still a connection between fertility levels and the prevalence of women with only-children in below-replacement contexts, the association is a lot weaker. Overall, the ra when considering all cohorts together is -0.77 (R^2 of 0.57), while rb is -

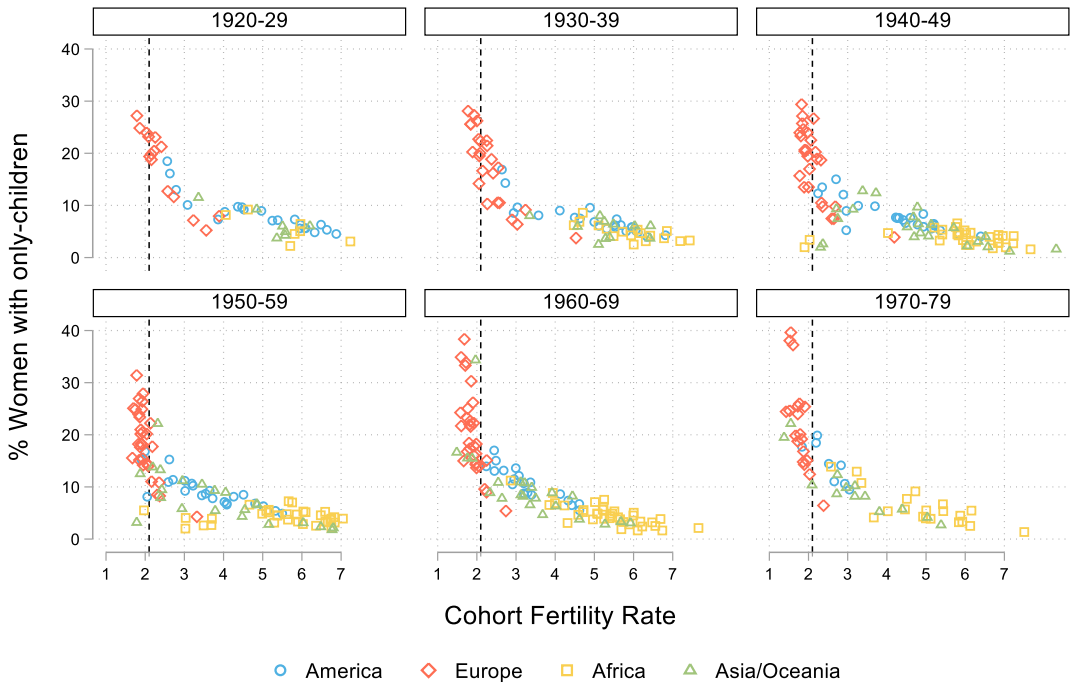
[7] The 2.1 cut-off was initially chosen due to its theoretical meaning. Populations approaching replacement fertility are an indication that more women are starting to adopt or strive for the two-child norm. At the same time, lower fertility outcomes become more prevalent. Other cut-offs were also tested (shown in the appendix) and reinforced the theory that this change in the relationship between fertility and prevalence of women with only-children is linked to a complex number of factors, that become more apparent as fertility declines.

0.33 (R^2 of 0.16). This hints at the fact that other factors might become responsible for the greatest differences in the trends when fertility reaches a certain low, as argued by this paper's third hypothesis. More specifically, as discussed earlier, as women gain more control over their own fertility, cultural and social factors might dictate the prevalence of only-children more strongly. This can include as the acceptance of only-children and of being childless in a particular society or the pressure put on women to have children, which will also affect fertility preferences.

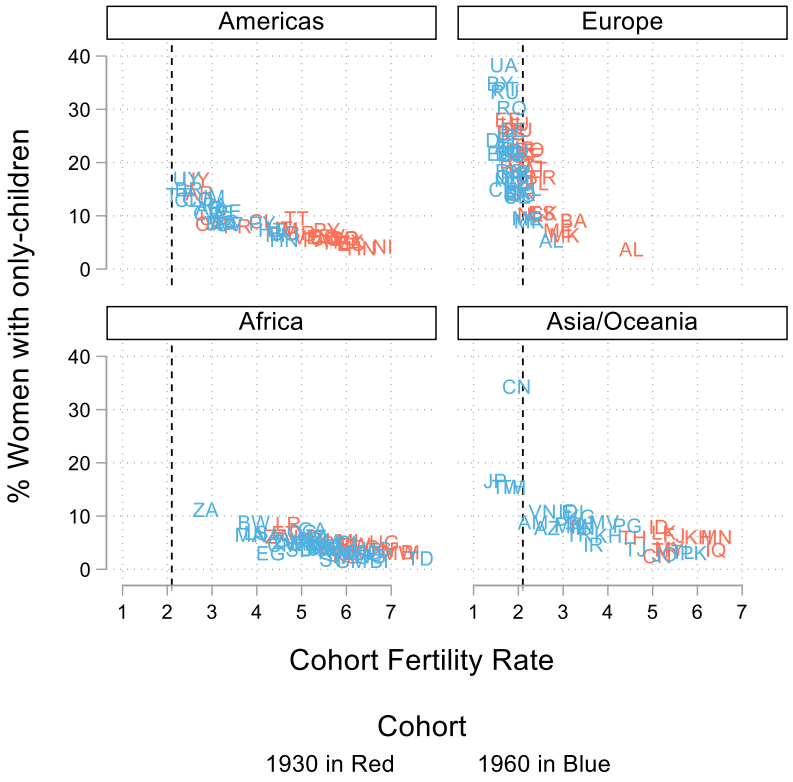
Looking at the figure from the regional perspective for the 1930-39 and 1960-69 birth cohorts allows us to more clearly see the countries in each region moving towards low fertility rates across cohorts, as well as the heterogeneity in only-child fertility as countries reach below replacement fertility. The figure also highlights the speed of the fertility transition in the Americas when compared to Asia/Oceania and Africa.

Figure 2.6 Proportion of women with only-children vs Cohort Fertility Rate for each (a) birth cohort of the mother and (b) region

(a) Cohort View



(b) Regional view, birth cohorts of 1930 and 1960



Note: 1) full list of country code labels can be found in Appendix.

Source: data from IPUMS-I, CFE, HFD and DHS.

Table 2.1 Correlation coefficient for above (ra) and bellow (rb) replacement fertility for each birth cohort of the mother

	ra	R^2	obs.	rb	R^2	obs.
1920-29	-0.85	0.73	46	-	-	4
1930-39	-0.80	0.65	65	-0.64	0.41	11
1940-49	-0.72	0.53	84	-0.37	0.14	18
1950-59	-0.71	0.51	82	-0.30	0.10	30
1960-69	-0.85	0.72	80	-0.35	0.10	30
1970-79	-0.81	0.65	39	-0.63	0.40	22

Source: data from IPUMS-I, CFE, HFD and DHS.

It is important to mention that a fall in fertility by 0.5 children per women, for example, has different impacts when talking about high or low fertility contexts. As previously discussed, countries with the same or very similar CFRs in below-replacement

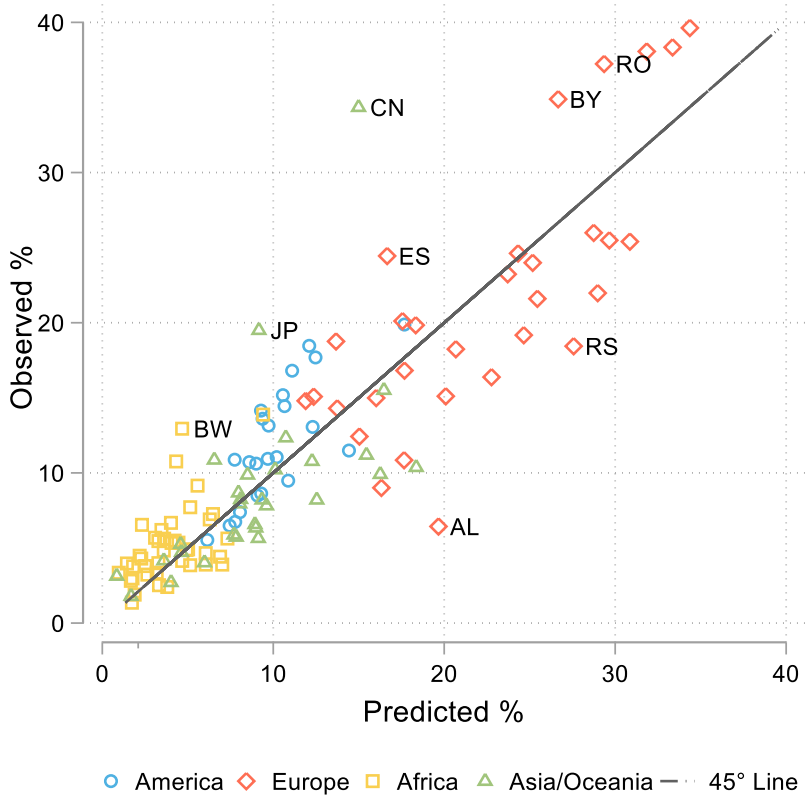
contexts can present a great variation in only-child fertility. This relationship seems to be true for all cohorts analysed, although it is mostly European countries which have reached this threshold. It is possible that as countries in other regions reach-below replacement fertility with their more recent cohorts, they would present different patterns due to contextual singularities.

Finally, I also create a counterfactual scenario where the CFR and mean age at childbearing are the only factors dictating the prevalence of women with only-children and compare it to the observed prevalences. The difference between the observed and predicted values shows how much of the trends are not being captured by these two variables (Figure 2.7).

Overall, the prediction is close to the observed prevalence for most countries, but there are some noticeable outliers, as seen in Figure 2.7. For countries where the predicted value is overestimating the observed value (below the reference line), women are having less only-children than expected by their overall fertility. This is the case for a large number of European countries. The Balkan region stands out with Albania and Serbia showing the biggest differences. This discrepancy between predicted and observed values could indicate a prejudice against only-children or a preference for childlessness or two-child families.

Oh the other hand, for countries where the value is underestimated (above the reference line), there are more only-children than expected. We can see China stands out, but also Japan, Botswana, Spain, Belarus and Romania. Socioeconomic factors could explain the higher prevalence of only-children in Sothern Europe, as increasing costs of living and uncertainty in the job market maybe working to limit fertility. In Botswana, socioeconomic and health factors could be limiting fertility. For Central and Eastern Europe and Japan, socioeconomic factors could be at play in addition to cultural factors.

Figure 2.7 Distribution of the observed and the predicted prevalence of women with an only-child for the most recent cohort of each country



Note: 1) country labels: CN China; JP Japan; BW Botswana; ES Spain, BY Belarus; RO Romania; AL Albania; RS Serbia. 2) R^2 (within) for each model: Americas (0.73); Europe (0.46); Africa (0.39); Asia/Oceania (0.41).

Source: data from IPUMS-I, CFE, HFD and DHS.

Together, all these factors may lead women to have a first child to avoid the stigma of being childless, but also avoid having larger families due to the social and economic burden of too many children. They may also be unable to have a second child due to health limitations or marriage breakdowns, for example. Specifically for East Asia, low fertility has been linked to patriarchal gender norms which put the homemaker burden heavily on women, leading many young women to postpone marriage and childbearing in favour of their education and careers (Jones, 2019).

When considering the level differences between countries, but also between regions, Europe stands out with the differences between the observed and predicted

values, in accordance to the heterogeneity discussed in figure 2.6. In Albania, for example, the predicted prevalence is 20%, while the observed prevalence is around 8%. On the other hand, African countries are much more closely clustered around the line, which makes the observed level in Botswana even more striking, as it presents a 12% observed prevalence, when it was expected it to be around 5% (predicted value). While the absolute difference between observed and predicted values for Botswana (7%) is smaller than for Albania (12%), the relative change is much closer (82% and 85% respectively), highlighting the importance of contextualising these changes within each region, as well as across regions.

While it is not a wild assumption to state that the prevalence of women with only-children is partly driven by overall fertility, saying that this is the only factor would be ignoring other important drivers acting within specific societies. This leads to the heterogeneity we observe between their trajectories over time.

2.7. Conclusions

In this chapter, I examined trends in the proportion of women with an only-child across 125 countries, from 1920–29 to 1970–79 birth cohorts. A few studies have taken such a cross-country comparative view (such as Frejka and Sardon 2007), but none, to my knowledge, has taken a truly global perspective. This study hoped to fill this gap and explore how this fertility outcome presents across different contexts.

The results at least partially corroborated the working hypothesis: the prevalence of only-child fertility has increased over time across the globe, and the trends can be closely linked to cohort fertility rates (hypothesis 1). In addition, countries in the same geographical region presented similar trends over time, at least for pre-replacement levels (hypothesis 2). This is partially explained by their similar fertility levels, but fertility change cannot explain all of the variation.

Finally, the results show that mean age at childbearing and CFRs are good predictors of only-child fertility. However, as overall fertility reaches below-replacement, its predictive power on the prevalence of women with only-children decreases (hypothesis 3), as can be seen for Europe. In earlier stages of the demographic transition, mothers of only-children are rare, and possibly a more homogeneous group. As countries reach later stages of the transition, only-children (and childlessness) becomes a more common fertility outcome. As a consequence, this group becomes more heterogeneous and the influence of other factors on parity decisions becomes more apparent. Some of these factors can include the costs of having children; pressure/desire for pursuing education/careers, leading to a delayed in marriage and childbearing; negative stereotypes against only-children, leading women to have a second child; more autonomy to choose their preferred family size or, conversely, social pressure to have at least one child.

Relative to mother's education, only-children are more prevalent among women with at least primary education, and this does not seem to be changing over time. This means that lower educated women, which are likely to have lower earnings as well, are still having to share their resources (financial or otherwise) between a larger number of children than higher educated women. From the child's perspective – with the caveat that prevalence of mothers of only-children doesn't exactly equal prevalence of only-children –, a growing prevalence of only-children from higher educated women could lead to a greater disparity between children from smaller and bigger families over the generations. In this scenario, most only-children not only would not have to compete for resources between siblings, but would also receive an advantage from being part of a family of higher socioeconomic status. In countries with a low fertility and high prevalence of only-children, we would expect to see a bigger polarization between children of different family sizes, and resource transmission from parents to children might become relevant

for the reproduction of inequality over the generations. This was not the focus of this study, however, and more research is still needed about the consequences of an increasing prevalence of only-children from the child's perspective.

It is important to reiterate here about the difficulty of defining only-children and only-child fertility, especially when dealing with a large number of data sources across different contexts over time. While the choice made in this chapter about the definition of only-child fertility could lead to an overestimation of only-child fertility, it was necessary to allow for this comparative overview of cross-country trends and still provides useful insights on female fertility.

This chapter was, of course, only an introduction to the study of only-child fertility. The descriptive findings in this chapter contribute to the discussion on the "pathways to fertility transition" by helping us think further about a convergence or divergence of fertility behaviours within and between regions over socioeconomic development. The results show that, while we are observing an overall increase in only-child fertility in all regions, there is still some variation between countries in the same stage of the demographic transition, and, more notably, among countries below replacement fertility level.

The global perspective of this chapter has its strengths and limitations. It allows me to map changes in a great number of countries, and observe regional patterns and heterogeneities. On the other hand, it does not allow for a nuanced understanding of each individual country context.

Delving deeper into the particularities of low-fertility contexts would require extra data collection and it would deviate from the global focus of this chapter, but it would be fruitful for future research to expand on the causes and consequences of one-child fertility countries that have reached below replacement fertility. Despite similar general fertility

levels, some countries present a high proportion of mothers of only-children, while others have a small prevalence of only-children, with most women choosing between having two children or no children at all. Central and Eastern Europe in particular deserves some attention, as most countries in this sub-region present a very high proportion of mothers of only-children and a low proportion of childless women simultaneously. Next chapter partially tackles this question by looking at fertility intentions and realisations of those intentions for selected European countries.

Chapter 3

Fertility intentions and outcomes for a first and second child in low fertility European contexts

3.1. Introduction

Currently, most countries in Europe present low or very-low fertility levels. This has led to an increase in the number of people who finish their reproductive period with zero or one children, defying the still dominant two-child ideal (Sobotka & Beaujouan, 2014). However, it is still unclear if this increase in only-children and childlessness in low fertility contexts is a conscious choice or a consequence of unrealised fertility intentions.

One way to approach this question is to focus on fertility intentions. The relevance of fertility intentions for predicting fertility behaviours has been a topic of debate in the sociological and demographic literature for a long time, and while there have been arguments citing the uncertainty of fertility intentions (Monnier, 1989; Quesnel-Vallée & Morgan, 2003; Toulemon & Testa, 2005), they have also shown to be good predictors of fertility behaviour (Islam & Bairagi, 2003; Schoen et al., 1999).

This chapter will contribute to the overall goal of this thesis by focusing on fertility intentions and outcomes for a first and second child in Eastern and Western Europe. The main goal of this chapter is to better understand factors guiding the transition from childlessness and only-child fertility across Europe. As discussed in the previous chapter, low fertility contexts in Europe present an interesting diversity in one-child and childless outcomes, especially when comparing Eastern and Western Europe. With that in mind, this chapter will look at these two regions separately, utilising two country examples from each region: Russia and Bulgaria (East), and France and Austria (West), with data from the first two waves of the Generations and Gender Survey (GGS).

Even though the analysis does not deal strictly with only-child fertility – as it looks at short-term fertility intentions and outcomes for a first and second child – it will still contribute to our understanding of only-children. First, looking at fertility transition from first to a second child gives us a better understanding of why people may intentionally or unintentionally have an only child: is it connected to low intentions for a second child or to a low realisation of those intentions? What are the factors affecting people's realisations of intentions?

Additionally, looking at transitions to a first child gives us a fuller picture of fertility decisions and allows us to explore cultural and socioeconomic factors that may impede or facilitate people becoming parents. It also helps to contextualise the intentions for a second child. Are the same mechanisms at play for both parity transitions or are intentions and outcomes for a second child unique in some regard? Considering the parity differences between Eastern and Western Europe, where childlessness is much less common in the former region, it is interesting to understand if the factors affecting the transition from a first to a second child are similar to those affecting transition into a first child and how that may vary between regions.

This analysis will be guided by the Theory of Planned Behaviour (TPB) (Ajzen, 1991; Ajzen & Klobas, 2013), and I will look at how people's subjective social norms, attitudes and perceived control over having and raising children affect intentions and realisation of those intentions to have a(nother) child in the next three years with the use of probit models with sample selection.

By separating the analysis between Eastern and Western Europe, the results also allow further exploration of the previously discussed ideas that the high prevalence of only-children in Eastern Europe, contrasted with the high prevalence of childlessness in

Western Europe, are a result of different social norms and expectations about children and family between countries in these regions.

3.2. Fertility intentions and realisations

Previous literature has highlighted the importance of demographic characteristics, individual and country-level socioeconomic variables, and social and gender norms for determining both fertility intentions and the realisation of those intentions.

In terms of demographic characteristics, increasing age and being out of union (or in a cohabitation without plans for marriage) have shown negative associations with intentions to have a child (Hiekel & Castro-Martín, 2014; Morgan & Rackin, 2010; Testa & Basten, 2014; Toulemon & Testa, 2005), while educational attainment, number of own siblings and current parity have shown positive associations (Mills et al., 2008; Testa & Basten, 2014; Toulemon & Testa, 2005).

As for realisation of these intentions, those who delay childbearing or marry later in life are less likely to have their planned child (Quesnel-Vallée & Morgan, 2003; Sobotka & Beaujouan, 2014; Spéder & Kapitány, 2014; Toulemon & Testa, 2005). Poor health or infertility are also constraints to realising intentions (Sobotka, 2009). And while being higher educated increases intentions, this doesn't necessarily translate into realised fertility (Bongaarts, 2002; Quesnel-Vallée & Morgan, 2003; Sobotka, 2009; Testa & Basten, 2014).

Socioeconomic variables, ranging from income, job type and the labour and housing market have also been shown to affect fertility intentions and outcomes, as they affect the opportunity costs of having children (Mills et al., 2008; Philipov & Kohler, 2001; Riederer & Buber-Ennser, 2018; Sobotka, 2009). Women active in the labour market might have to choose between their career and raising a family, especially in contexts with lack of maternity leave or available childcare. However, being unemployed

doesn't necessarily have the opposite effect. Philipov et al. (2006) show that, for the case of Bulgaria, if women are unemployed and the partner's income is sufficient, they might opt to have the planned child. On the other hand, unemployed women might also be determined to find work for self-realisation or for income, and might, therefore, chose to postpone a birth – which may never be realised.

In addition, a worsening of a household's financial situation (due to an economic crisis or otherwise) will affect people's certainty in their intentions and the concretization of such intentions (Testa & Basten, 2014). For Eastern Europe, authors highlight the importance of social anomie, which is a sociological term used to describe a situation where people become disoriented and uncertain in a context of a rapid changing society, as was the case for many countries in the 1990s after the fall of the Soviet Union (Philipov et al., 2006). The socioeconomic changes in these countries also led to a breakdown of old norms and values, which contributed to uncertainty in many areas of life, including whether or not to have children.

Van Bavel and Nitsche (2013) discuss how, in more conservative settings, such as in post-socialist Eastern European countries, people may feel obliged to fulfil a duty of having children, as they attach high value to parenthood as a mark of adulthood. However, the progression to a second child will depend on their socioeconomic certainty, as they may not feel like they can afford more than one child.

Finally, societal expectations for the ideal number of children also affect intentions (Beaujouan & Berghammer, 2019; Quesnel-Vallée & Morgan, 2003; Régnier-Loilier et al., 2011). These social norms can be influenced by current and past family policies (Billingsley & Ferrarini, 2014; Mönkediek & Bras, 2018; Spéder & Kapitány, 2014) and may intensify the pressure from family, friends or partners to have children.

The presence (or lack) of family networks can also influence peoples fertility behaviour (Balbo and Mills 2011b).

In addition, gender norms related to division of childcare and housework have also been shown to partially explain intentions for women (Billingsley & Ferrarini, 2014; Mills et al., 2008), however they seem less important for realisation of these intentions (Riederer et al. 2019).

These effects can also vary by parity. Billingsley and Ferrarini (2014), when looking at the impact of family policies on fertility intentions in Europe, remark that countries with policies that support families in which both members of a couple are earners and carers have a positive association with fertility intentions, regardless of parity. However, policies that support a more gendered division of labour only have a positive association for a first child, and might even have a negative association with intentions to have a second child.

Balbo and Mills (2011a), for the cases of France, Germany and Bulgaria, remark that children can be seen as a way to build family social capital, and having siblings with young children would increase one's probability to realise their fertility intentions. However, people who already felt satisfied by their family network would lack the motivation to enact on their positive fertility intentions, particularly for those that already had one child.

Taking into account that fertility intentions and behaviour are determined by these multiple dimensions, the analyses in this chapter will be guided by the Theory of Planned Behaviour (TPB), which provides a good framework to better understand how these different factors interact.

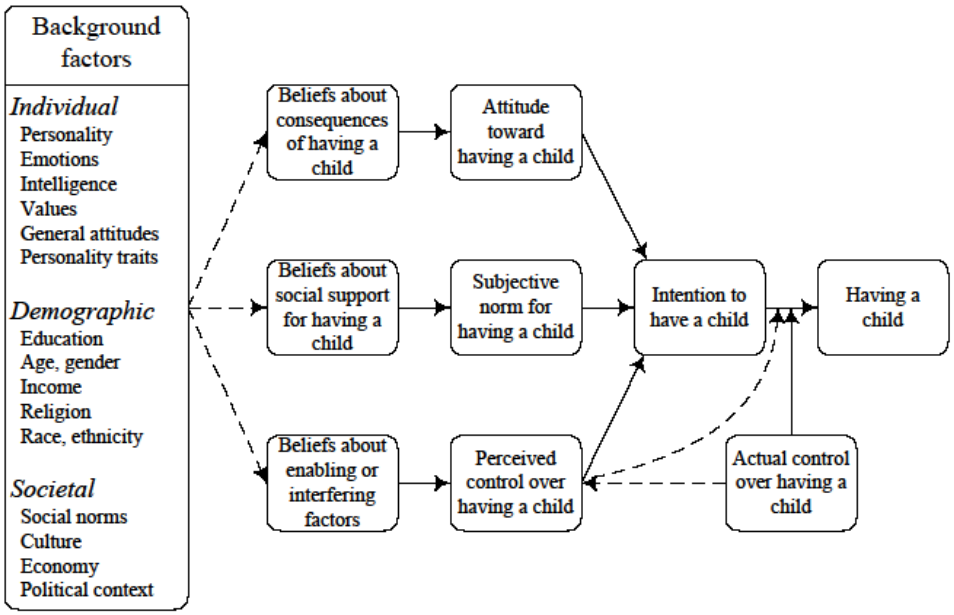
The TPB originated in the field of psychology and eventually spread to other disciplines. In more recent decades, this theory has been applied in social demography to

explain fertility decisions (Ajzen & Klobas, 2013; Billari et al., 2009; Ciritel et al., 2019; Dommermuth et al., 2011; Mönkediek & Bras, 2018).

According to TPB, the intention to have a child is determined by a series of background factors, which affect people beliefs and those beliefs affect people's attitudes, norms and perceived control over having a child (Figure 3.1).

Attitudes, in this context, represent a person's perception of whether having a child would lead to positive or negative outcomes. The TPB incorporates the theories about cost and value of children, which have been studied for many decades (Becker, 1981; Hoffman, 1975; Miller & Pasta, 1993), and complements them with a broader framework. Therefore, this would include not only considerations about the economic cost of children, but also limitations on their freedom and time, the benefits of children for old age, and general life satisfaction related to having a child.

Figure 3.1 Conceptual model for the Theory of Planned Behaviour applied to fertility decisions



Source: Ajzen and Klobas (2013).

Subjective norms represent the perceived social pressure for having or not having children. In practice, this would be translated into how they think their family, friends, or even society as a whole, would react to them having a/another child. Mönkediek and Bras (2018), show how family systems can influence fertility intentions in several ways, as they mould people's expected requirements for having children, as well as what is an expected household or family size.

Sobotka (2009) also shows this for the case of Austria, where several generations of low fertility seem to have created a preference for small family size and possibly even childlessness. For Romania, Ciritel et al. (2019) highlight that social pressure was the most important aspect in fertility decision-making among those with one or zero children. In Italy, Régnier-Loilier et al. (2011) highlight how intentions are shaped by social norms, as couples were less likely to say they wished to remain childless when compared to France, as that outcome is not very acceptable in the Italian context.

Of course, these norms may change over time and alter the way people view children across different generations. This is closely related to what is discussed by the Second Demographic Transition, which argues that, as societies reach a certain level of economic development, people start to strive for more individual autonomy and independence, which changes the way people perceive childbearing, affecting their fertility desires.

Finally, perceived control relates to how people believe they are able to raise and care for a child. This includes considerations on their financial situation, having found the right partner, their health or working situation. Perceived control can be seen, for example, when people access their marital situation. This perceived control is moderated by their actual control: an individual might believe their can have a child, but they might be limited by factors out of their control, such as not having found a partner.

In addition, in the background of all these factors there are also indirect effects that are important to consider. These can include personal characteristics, such as religion, education, age, gender and birth cohort. Culture, in a more broad sense, can also be included as an indicator of how society as a whole views certain fertility behaviours, such as childlessness. Living in a more patriarchal or traditional society will affect people's attitudes, norms and behaviours differently than if they lived in a more liberal environment.

In summary, the TPB, when applied to fertility intentions, is a framework that encompasses the considerations a person makes when thinking about having a child, from the impact a child would have on their lives (positive and negative), how other people would react to their decisions and whether or not they have the conditions to raise this child. This framework helps to test what factors are more or less important and how they can vary for different contexts, including different order births.

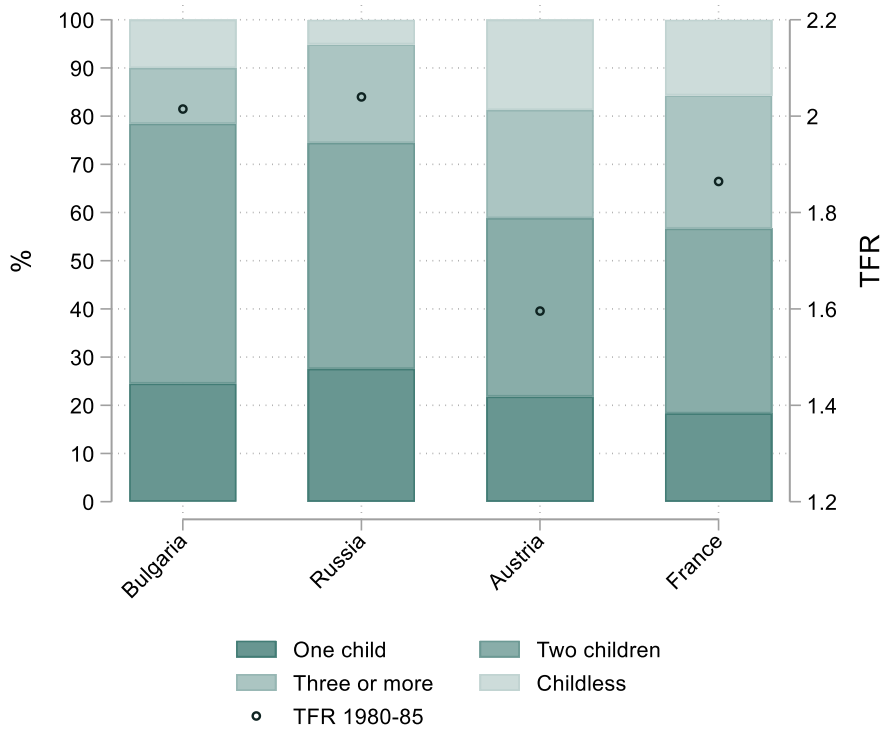
3.3. Fertility and family in Europe

As discussed in the previous chapter, the overall low levels of fertility in Europe don't necessarily translate into uniform levels of childlessness and one-child fertility. Central and Eastern Europe specifically presented very high levels of women with only-children and low levels of childlessness when compared to Western Europe.

The analysis of this chapter will compare these two regions with data from four countries that exemplify this difference: Bulgaria and Russia, grouped to represent Eastern Europe; and Austria and France, grouped to represent Western Europe. The first two countries present a high prevalence of women with only-children and low prevalence of women with no children. They also present a very high prevalence of women with two-children. In comparison, Austria and France present a much higher prevalence of childlessness, and lower prevalence of only-child and two-child fertility, despite the later

still being the dominant fertility outcome. The Eastern European countries also present an overall higher Total Fertility Rate (TFR) than countries in Western Europe, although both groups present below replacement fertility rates. Figure 3.2 exemplifies this with the parity distribution for women 40-44 years old in the GGS, and the TFR for the 1980-85 for these countries.

Figure 3.2 Proportion of women aged 40-49 by parity and country and TFR 1980-85



Source: Generations & Gender Survey, wave 1; United Nations, World Population Prospects 2019

These parity distributions seem to indicate, at first glance, different fertility preferences between Eastern and Western European countries. The literature has shown that the fertility patterns of Central and Eastern Europe (CEE) have contrasted with the rest of Europe since at least the 1960s (Sobotka, 2003), but especially since the 1990s. Part of the differences between Eastern and Western Europe can be attributed to the differences in the history of their political regimes. Many countries in CEE were under

direct or indirect influence of the Soviet Union during great part of the 20th century. The fall of this regime in the late 1980s brought a great economic, political and cultural shock to the region.

Russia and Bulgaria, specifically, share a lot in terms of cultural, demographic and socioeconomic backgrounds. Under the Soviet Union, both countries had early and nearly universal marriage, rare incidences of divorce, and childbearing was almost exclusive to married couples. Before and after the fall of the USSR, both countries had similar educational systems, and very high female labour force participation, in addition to similar childcare regimes to support working mothers (Kostova, 2008; Philipov & Jasilioniene, 2007). France and Austria, on the other hand, have relatively high rates of births to single mothers and cohabiting couples (Andersson, 2002).

After the collapse of the USSR, Eastern Europe suffered great changes. The most obvious was the drop in GDP and real incomes, and the rise of unemployment and inflation. In addition, the change in regime led to an increase of subsistence costs and the disappearance of several childcare related subsidies (Macura, 1996; Philipov & Kohler, 2001; Spéder & Kapitány, 2014). During this period, the region also experienced a significant fertility decline, which many attribute the economic crisis – and the subsequent uncertainty of the near future – as the main driving factor (Bradatan & Firebaugh, 2007; Philipov & Kohler, 2001; Sobotka, 2011; Spéder & Kapitány, 2014).

The change in regime also led to an erosion of the communist ideology in the region and the adoption of more "western values" (Spéder and Kapitány 2014), which affected the norms, values, attitudes and preferences related to fertility. However, contrary to the slow and gradual ideological shifts that occurred in Western Europe as they arrived at their current political ideology, the changes observed in CEE happened at

a much faster speed, as they were driven by the political and economic shifts forced by the regime transition (Philipov, 2002; Sobotka, 2003).

While both Eastern and Western Europe present low fertility levels, the former is marked by more traditional attitudes towards family, an early mean age at childbearing and a low prevalence of childlessness (Billari & Kohler, 2004; Sobotka, 2003, 2011). Sobotka and Testa (2008), looking at attitudes towards childlessness in Europe, show a strong relationship between intention to remain childlessness and preferences for less traditional family attitudes.

In Western Europe, postponements in the mean age at childbearing, and the connected increase in women's labour force participation, are seen as one of the main driving forces behind the fertility decline in the late quarter of the 20th century (Neyer, 2003).

Differences across Europe can also be seen in their approaches to family policies. Frejka et al. (2016) identify different types of family policies in CEE for recent years. Russia, and possibly Bulgaria, are classified in their analysis as fitting into a "pronatalist model", with large birth allowances and well remunerated parental leave. In comparison, in France, childcare provided by the state has been widespread, especially for families with at least two children, which help women balance out work and home life (Balbo & Mills, 2011b). In Austria, the family policies are more geared towards financial allowances for younger children (0-2 years), with childcare playing bigger role for children of kindergarten age (3-5 years) (Mahringer & Zulehner, 2015).

3.4. Guiding hypotheses

As previously discussed, this chapter hopes to contribute to the study of only-children by taking a broader look at factors affecting intentions and realisation of intentions for a first and second child. Looking at the second child fertility can help us

more directly understand if the observed prevalence of only-children in Europe is a consequence of desired fertility or of unrealised intentions. Additionally, as shown in the discussions of the previous chapter, childlessness and only-child fertility in low fertility contexts can sometimes grow in similar or opposite directions, as can also be seen in the parity variations observed between Eastern and Western Europe. Therefore, this chapter also explores fertility intentions and behaviours for those wishing to have a first child, as a complement for understanding the low fertility heterogeneity in Europe.

With that in mind, a few hypotheses are formulated to guide the analysis of this study. First, when thinking about fertility intentions, it is expected that attitudes, subjective norms and perceived control will affect intentions regardless of parity or region. However, the persistence of the two-child norm and the low prevalence of childlessness in Eastern Europe seems to indicate a high social pressure to have a family in this region. In Western Europe, the high prevalence of childlessness may indicate that intentions may be more strongly driven by attitudes towards having children, as people may feel less pressured to have a child when they don't feel ready. Therefore:

H1a. The effects of subjective norms, when compared to perceived control and attitudes, on the intentions to have a first child or second child in the next three years will be relatively stronger in Eastern Europe.

And:

H1b. The effects of attitudes, when compared to perceived control and subjective norms, on the intentions to have a first child or second child in the next three years will be relatively stronger in Western Europe.

As for the realisation of intentions, while social pressure may play an important role, physiological and socioeconomic constraints may prevent people from achieving

their desired fertility. Therefore, the actual realisation of those intentions in the short term (in this case, 3 years) may be more strongly guided by the barriers they face to conceive and raise a child (perceived control). Therefore:

H2. The higher the level of perceived control, the higher the probability of realising the intention to have a first or second child in the next three years.

When considering having a first child, however, it is possible that subjective norms may play a bigger role than when considering to have a second child, as the social pressure to leave childlessness may surpass people's worries about their socioeconomic uncertainties. With that in mind, the final hypothesis states that:

H3. Subjective norms will have a stronger positive effect on the realisation of intentions to have a first child than on the realisation of intentions to have a second child.

3.5. Data and methods

3.5.1. Data and sample

Data from waves 1 and 2 of the Genders and Generations Survey (GGS) are used in this study[8]. The GGS is the survey conducted by the Generations & Gender Programme Research, which provides open-access and cross-nationally comparative data. The survey focuses on inter-generational and gender relations. They collect data on respondents aged 18-79 with a sample size of about 10 thousand respondents per country. This survey is a successor to the Fertility and Family Survey (FFS), which was conducted in the 1990s.

Wave 1 of the survey was conducted in 18 European countries starting in 2004. The second wave was conducted three years later and out of the original countries, only thirteen were included. The selected countries for this analysis (Russia, Bulgaria, Austria

[8] For more information on the GGS waves see *Gauthier et al., 2018* (DOIs: 10.17026/dans-z5z-xn8g, 10.17026/dans-xm6-a262), or visit the GGP website (https://www.ggp-i.org/) for methodological details.

and France) were chosen due to theoretical and methodological reasons. First, these countries are included in both waves of the survey, and have information on the dependent and independent variables used for the analysis, with a big enough sample size in both waves for the analysis of intentions and outcomes. In addition, these countries represent the average parity outcomes for Western and Eastern Europe, as discussed in Figure 3.2.

The countries were grouped between Western and Eastern Europe, instead of being analysed separately, as the focus of this study is not the countries specifically. These countries represent their respective regions in terms of fertility outcomes and overall culture, views towards family and socioeconomic backgrounds. In addition, grouping the countries facilitates the analysis by increasing the sample sizes.

For this study, the sample is restricted to women and men, aged 18-44 in wave 1 of GGS, who have zero or one child. This same sample is then followed in wave 2, three years later, for the analysis of the realisation of intentions. Infertile men and women were excluded from the sample. The re-interview rate for the countries included in both waves is around 65%. A descriptive table of the sample can be found section 3.6.

3.5.2. Variables and analytical method

The main dependent variables for this study are intentions to have a child and the realisation of such intentions in the next three years. The fertility intentions were computed directly from the question "do you intend to have a child during the next three years", asked in wave 1 of the GGS. And the realisation of those intentions was computed based on whether the respondent has had a child between the first and second wave, for those who had previously stated a positive intention. Both of these variables – intentions and realisations – were turned into dummy variables, which take the value of 1 for those who had positive intentions and for those who realised their positive intentions, respectively.

The main independent variables are the attitudes, subjective norms and perceived control over having a child, as guided by the TPB. They were constructed based on the answers to a few different questions that, together, represent each of these pillars of the TPB.

a) *Attitudes*: divided into costs and benefits and constructed based on the answers to following 7 questions[9]:

a. *Costs*: the respondents are asked to answer, on a scale of 1 to 5, what do you think the effects of having a/another child would be on: i) possibility to do what you want, ii) employment opportunities, iii) financial situation.

b. *Benefits*: again, on a scale of 1 to 5, what the effects would be on: i) joy and satisfaction you get from life, ii) closeness between you and your parents, iii) care and security you may get in old age, iv) and what people around you think of you.

b) *Subjective Norms*: In these 3 questions, respondents were asked to rank, on a scale from 1 to 5[10], if i) most of your friends, ii) most of your relatives, and iii) your parents think you should have a/another child. The responses were also recoded so that 1 meant "strongly disagree" and 5 means "strongly agree".

c) *Perceived control*: There were 7 items used for this variable. Similarly, respondents were asked if your decision to have a/another child depends on, on a scale

[9] During the interview, these questions are asked of the respondents in the following way: "Now, suppose that during the next 3 years you were to have a/another child. I would like you to tell me what effect you think this would have on various aspects of your life. Please choose your answers from the card (much better, better, neither better or worse, worse, much worse)."

[10] During the interview, these questions are asked of the respondents in the following way: "Although you may feel that the decision to have a/another child is yours (and your partner's/spouse's) alone, it is likely that others have opinions about what you should do. I'm going to read out some statements about what other people might think about you having a/another child during the next three years. Please tell me to what extent you agree or disagree with these statements, choosing your answer from the card (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree)."

from 1 to 4[11]: i) your financial situation, ii) work, iii) housing conditions, iv) health, v) having a suitable partner, vi) availability of childcare and vii) opportunity to go on parental leave. These answers were recoded so that 1 means "a great deal" and 4 means "not at all".

To include these variables in the analysis, an index measure was created for each one of these categories (benefits, costs, subjective norms and perceived control) by taking the mean of the items that compose it. The continuous variables were centred to avoid multicollinearity.

In addition, the model also controls for a few socioeconomic variables, well established in the literature of fertility intentions and outcomes (Billari et al. 2009; Speder and Kapitany 2009; Balbo and Mills, 2011). Those are *age* (and age squared, to control for a curvilinear effect); *partnership status*, with three categories – married, cohabiting and out of union (which includes single, widowed, and divorced/separated); *highest level of education* – low (ISCED 1-2), medium (ISCED 3-4) and high (ISCED 5-6); *number of siblings*; and *gender* (male/female). These are all measured at wave 1, when the information on fertility intentions were collected. Initially, activity status was also considered, but eventually removed after preliminary tests in favour of education.

The main estimation of interest for this study are the effects of the TPB variables on the probability of realising positive fertility intentions for a first and second child within the next three years. I utilise probit models with sample selection as my main form of analysis, which are estimated with maximum likelihood. This model was chosen as it allows me to explore the factors affecting both intentions and realisations, as well as to look out for any selection issues when analysing only those with positive fertility

[11] During the interview, these questions are asked of the respondents in the following way: "How much would the decision on whether to have or not to have a/another child during the next three years depend on the following? (not at all, a little, quite a lot, a great deal)."

intentions. Using a probit over a logit model also facilitates interpretation and comparison with previous literature (Balbo & Mills, 2011b).

This model consists of two probit equations, where the first describes the probability of having positive fertility intentions (selection into the event), and the second equation, defined only when intentions are positive, refers to the realisation of these intentions. Both equations include similar predictors, however benefits and costs were not included in the outcome equation. The general equations used for this model are shown below (Equations 3.1a and 3.1b).

$$Probit(A = 1|X) = \beta X \qquad \text{(3.1a Selection Equation)}$$

$$Probit(B = 1|A = 1,\ Z) = \delta Z \qquad \text{(3.1b Outcome Equation)}$$

In the case of this study, the selection equation (3.1a) represents the probability of having a positive fertility intentions. *A* is a binary variable indicating whether the respondent intends to have a child in the next three years, where *A = 1* represents a positive intention. Similarly, the outcome equation (3.1b) represents the probability of realising positive intentions, where *B* is a binary variable indicating whether the respondent had a child, and *B = 1* represents a positive fertility. *X* and *Z* represent the set of predictors for each equation and β and δ represent the regression coefficients estimated for the predictor variables of their respective equations.

To test the third hypothesis, a probit model for the realisation of intentions with the same controls is run, but with pooled data for both parities, and an interaction effect between parity and subjective norms and parity and perceived control, where subjective norms and perceived control are continuous variables.

3.6. A descriptive look at fertility intentions

Table 3.1 presents the descriptive characteristics of the sample. It is noticeable that the proportion of people with positive intentions is fairly low, but increases with age (Figures 3.3a and 3.3b). The proportion of people who realised their positive intentions in the following three years is also very low, indicating that intentions are not being fulfilled in the short-term.

Table 3.1 Descriptive characteristics of the sample, by region and parity

	Western Europe				Eastern Europe			
	Childless		1 Child		Childless		1 Child	
Positive Intention								
Yes	34.7		39.7		35.9		26.4	
No	65.3		60.3		64.1		73.6	
Realised positive intention								
Yes	38.1		53.2		17.6		56.9	
No	61.9		46.8		82.4		43.1	
Gender								
Male	54.6		47.5		63.6		37.6	
Female	45.4		52.5		36.4		62.4	
Education								
Low	11.4		9.5		15.8		7.7	
Medium	65.5		68.6		59.1		54.3	
High	23.1		21.9		25.1		38.0	
Partnership status								
Married	7.9		53.5		5.2		72.9	
Cohabiting	17.1		29.5		6.0		8.9	
Out of Union	75.0		17.1		88.9		18.2	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Age	26.7	6.9	34.3	6.1	24.9	6.2	32.3	6.3
Sibship size	1.9	1.5	2.2	1.8	1.2	1.0	1.3	1.1
Benefits (0-5)	3.4	0.4	3.2	0.4	3.7	0.6	3.4	0.5
Costs (0-5)	3.7	0.6	3.5	0.6	3.6	0.7	3.7	0.6
Subjective Norms (0-5)	2.5	1.1	2.7	1.1	2.9	1.2	2.7	1.1
Perceived Control (0-4)	2.8	0.7	3.1	0.7	2.5	0.8	2.8	0.8
N	2110		862		1635		1706	

Note: Cronbach's Alpha for Benefits (0.73), Costs (0.75), Norms (0.93), Control (0.83).

Source: Generations & Gender Survey, wave 1 and 2

The low proportion of childless people who realise their fertility intentions could be related to their marital status. Most of the childless sample is not in a union (single or divorced), especially in Eastern Europe. In Western Europe, we also notice a higher proportion of people in cohabitations when compared to Eastern Europe for both parities. It is possible that while these people want to have a child, they were unable to find a suitable partner in the three years between waves and were forced to postpone their plans.

The gender distribution of the sample is fairly balanced for Western Europe, but in Eastern Europe, we see more childless males and one-child females with intentions to have a(nother) child in the short-term. This could be related to age imbalances in relationships, leading to men having children later in life when compared to women.

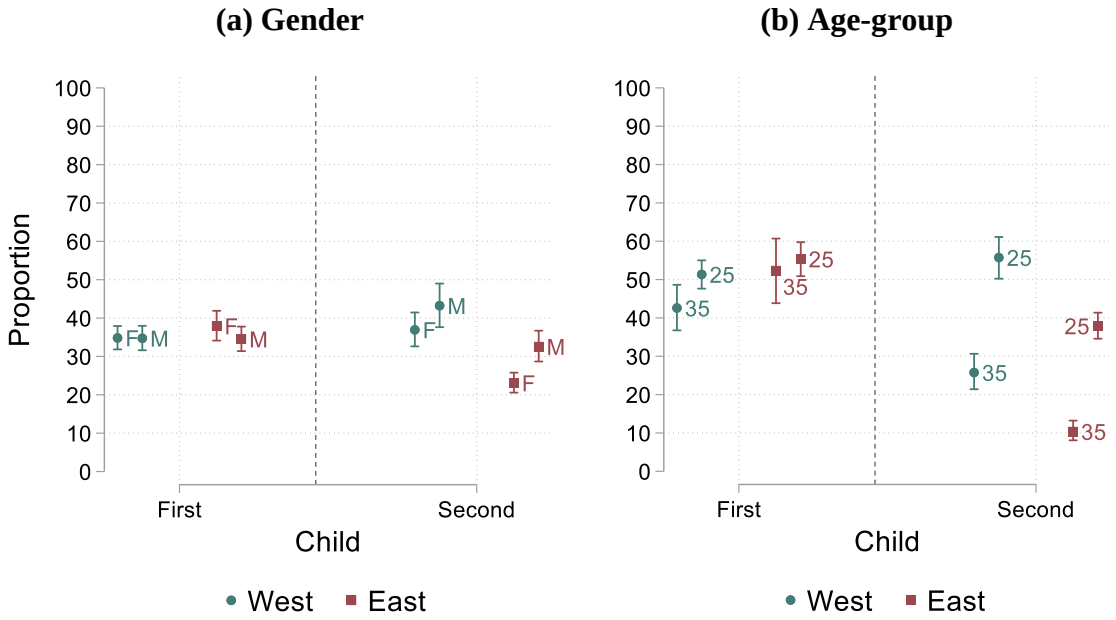
The average age of the sample is 26 and 33 years old for those childless and with one child, respectively, and the sample is slightly younger in Eastern Europe. And despite higher TFR, average number of siblings (sibship size) is smaller in Eastern Europe than Western Europe, highlighting a higher prevalence of one-child families in the East. The majority of the sample for both regions has medium education (ISCED3-4), with not much apparent differences between parities.

Figures 3.3a and 3.3b show fertility intentions by gender and age-group, respectively, for each region and parity. In Figure 3a we notice that intentions are similar for men and women, with men having slightly higher intentions than women regarding a second child.

When looking only at people aged 25-34 and 35-44 (ignoring the younger age group 18-24), we notice that positive fertility intentions increase in prevalence (Figure 3b). There's also a larger discrepancy in intentions for a second child between the two age groups, with the older age group having much lower intentions. It seems that people in the older age group have either already achieved their desired intention of one child,

or have given up on having more children due to their age. Meanwhile, people with no children, still have a relatively higher intentions, even in the older age group.

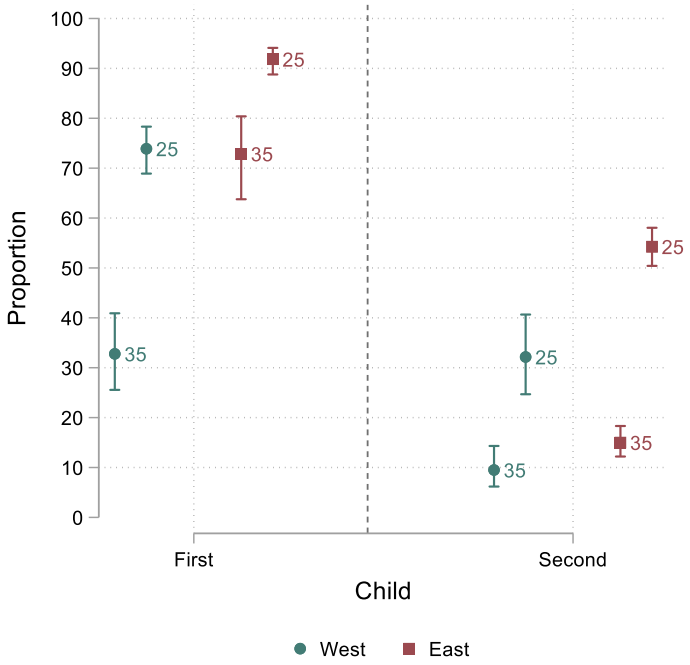
Figure 3.3 Intention to have a child in the next 3 years, East and West Europe, by (a) gender and (b) age-group



Source: Generations & Gender Survey, wave 1 and 2

When looking at intentions to have a child after three years (long-term fertility intentions), there's a much higher level of positive intentions for the younger age group, indicating they may not be ready for a child just yet, but do want a child in the future (Figure 3.4). Interestingly, intentions are still low for the older age group – which makes sense for the reasons discussed above – with the exception of childless people in Eastern Europe. This again indicates a social or cultural reason for the low-prevalence of childlessness in the region, as most people, even those approaching the end of their reproductive period, still indicate that they want to have at least one child.

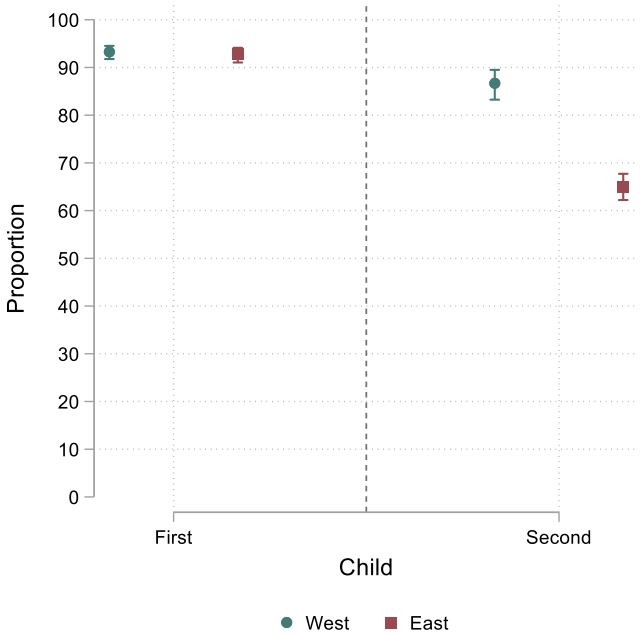
Figure 3.4 Intention to have a child after the next 3 years, East and West Europe, by age-group



Source: Generations & Gender Survey, wave 1 and 2

While not the focus of this study, it can be interesting to look at realisation of negative intentions (Figure 3.5). For those who did not want a child, over 90% of childless people realised those intentions (e.g. did not have a child). Interestingly, for those who already had one child, the realisation of negative intentions is lower, especially for Eastern Europe. This could indicate either unintended pregnancies or a change in intentions between waves 1 and 2. Interesting to note that this proportion is smaller for Eastern Europe, which could indicate a higher social pressure for having children, even among those who initially did not plan on having a child.

Figure 3.5 Intention to not have a child in the next 3 years, East and West Europe



Source: Generations & Gender Survey, wave 1 and 2

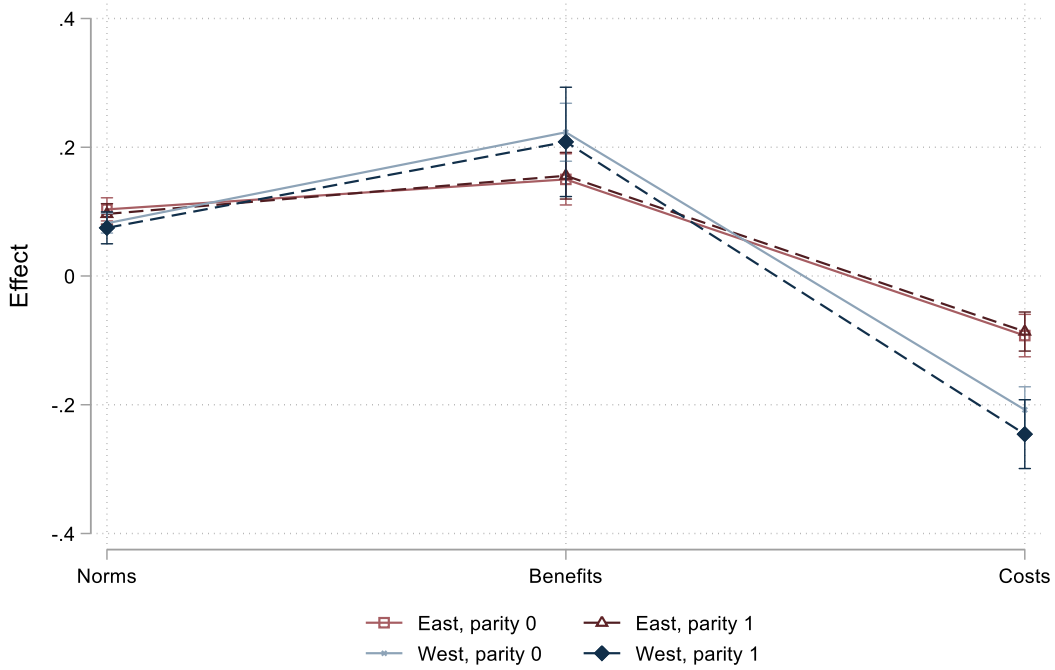
3.7. Results

Tables 3.2a and 3.2b present the results for the four probit models with sample selection. Models 1 and 2 present the results for Western Europe, and models 3 and 4 present the results for Eastern Europe, for people having (or intending to have) the first and second child, respectively, in both cases. The first part of the model presents the results for the realisation of positive fertility intentions, and the second part presents results for the selection equation of having positive fertility intentions in the next three years.

Looking at intentions first, norms, benefits and costs all have significant effects on intentions to have a first or second child in the next 3 years for both regions. As expected norms and benefits have positive effects, and costs have negative effects on intentions. To facilitate visualisation of the results in the tables, Figure 3.6 presents the average marginal effects for benefits, costs and norms for fertility intentions for Eastern

and Western Europe. Both parities and regions are presented in the same graph for ease of presentation, but they are each from separate models.

Figure 3.6 Average marginal effects (95% Cis) for TPB variables on intentions to have a child in the next three years, by region and parity



Source: Generations & Gender Survey, wave 1 and 2

The figure shows that the effects of subjective norms and benefits are relatively closer in Eastern than Western Europe, despite benefits (positive) and costs (negative) having an overall stronger effect. When considering the idea of having children (intentions), perceived control was not significant.

Perceived control measured if people's decisions to have a child depended on things such as their financial situation, health, housing condition etc. It seems that when considering an uncertain future outcome (having a child within three years), these things are not as impactful for their decisions as what they think the effects of having a child would be on their freedom, life satisfaction etc. (benefits and costs). Norms, measuring

what family and peers would think of the respondent having a child, while relevant for all outcomes measured, are still not as strong as the perceived effect of a child for the respondent's life.

Turning to tables 3.2a and 3.2b to look at other controls, being out of union has a negative effect on the probability of intending to have a child, when compared to being married. Higher levels of education had a positive (and significant) effect for the West and a negative effect for the East. The positive effect of education in the West could be understood as a proxy for an income effect (Balbo & Mills 2011a). For Eastern Europe, however, educational level doesn't seem to be as impactful for intentions, which could be due to the different social and cultural context of the region regarding family. Interesting to note that women are significantly less likely to intend to have a second child than men in Eastern Europe.

Considering that the GGS questionnaire was constructed with the TPB in mind, it makes sense that these variables are shown to correlate to fertility intentions. When considering their impact for the realisation of intentions, the effects of the TPB are much less pronounced. In initial tests it was determined that benefits and costs do not affect realisation of positive intentions in any of the models and were not included in the final models. Perceived control is positive and significant for those having a first child in Western Europe, and those having a second child in Eastern Europe. And subjective norms is only significant for those having a first child in Western Europe. These results partially support the second hypothesis.

Table 3.2 Probit model with sample selection for the realisation of intentions (outcome equation) and fertility intentions in the next 3 years (selection equation), Eastern (a) and Western (b) Europe, for a first and second child

(a) Eastern Europe

	First child (1)		Second Child (2)	
Realisation of fertility intention				
Age	0.097	(0.132)	0.197	(0.129)
Age squared	- 0.002	(0.002)	- 0.005*	(0.002)
Partnership status (ref.: married)				
Cohabiting	- 0.189	(0.240)	- 0.210	(0.206)
Out of Union	- 0.715**	(0.239)	0.162	(0.265)
Education (ref.: low)				
Medium	- 0.282	(0.194)	0.293	(0.256)
High	- 0.205	(0.219)	0.600*	(0.270)
Sibship size	0.021	(0.056)	0.278***	(0.074)
Gender (ref. male)	- 0.009	(0.139)	- 0.447**	(0.143)
Subjective Norms	0.021	(0.098)	- 0.102	(0.103)
Perceived control	0.016	(0.090)	0.400***	(0.091)
N	**590**		**449**	
Fertility intention				
Age	0.501***	(0.052)	0.330***	(0.075)
Age squared	- 0.008***	(0.001)	- 0.006***	(0.001)
Partnership status (ref.: married)				
Cohabiting	- 0.403	(0.252)	0.300*	(0.138)
Out of Union	- 1.013***	(0.210)	- 0.402**	(0.130)
Education (ref.: low)				
Medium	- 0.192	(0.118)	- 0.208	(0.165)
High	- 0.101	(0.136)	0.141	(0.174)
Sibship size	0.108**	(0.0378)	- 0.046	(0.040)
Gender (ref. male)	0.319***	(0.0803)	- 0.195*	(0.089)
Subjective Norms	0.334***	(0.039)	0.421***	(0.042)
Perceived control	0.062	(0.055)	0.110	(0.057)
Benefits	0.624***	(0.082)	0.726***	(0.091)
Costs	- 0.356***	(0.066)	- 0.418***	(0.074)
N	**1635**		**1706**	
Rho	**-0.249**		**0.238**	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

(b) Western Europe

	First child (1)		Second Child (2)	
Realisation of fertility intention				
Age	0.211*	(0.083)	0.179	(0.149)
Age squared	- 0.004**	(0.001)	- 0.004	(0.002)
Partnership status (ref.: married)				
Cohabiting	- 0.239	(0.142)	- 0.035	(0.157)
Out of Union	- 0.842***	(0.147)	- 0.081	(0.274)
Education (ref.: low)				
Medium	- 0.206	(0.226)	0.056	(0.315)
High	- 0.141	(0.240)	0.153	(0.342)
Sibship size	0.041	(0.030)	0.009	(0.041)
Gender (ref. male)	0.227*	(0.102)	0.021	(0.150)
Subjective Norms	0.117*	(0.056)	0.071	(0.082)
Perceived control	0.182*	(0.073)	0.173	(0.115)
N	**748**		**344**	
Fertility intention				
Age	0.369***	(0.047)	0.256**	(0.088)
Age squared	- 0.006***	(0.001)	- 0.005***	(0.001)
Partnership status (ref.: married)				
Cohabiting	- 0.213	(0.129)	- 0.062	(0.116)
Out of Union	- 0.664***	(0.118)	- 0.377*	(0.153)
Education (ref.: low)				
Medium	0.261*	(0.131)	0.481*	(0.194)
High	0.296*	(0.144)	0.652**	(0.217)
Sibship size	0.043	(0.022)	0.046	(0.030)
Gender (ref. male)	0.250***	(0.071)	0.068	(0.108)
Subjective Norms	0.274***	(0.033)	0.264***	(0.050)
Perceived control	- 0.003	(0.051)	- 0.085	(0.078)
Benefits	0.860***	(0.096)	0.748***	(0.166)
Costs	- 0.805***	(0.077)	- 0.924***	(0.113)
N	**2110**		**862**	
Rho	**0.132**		**-0.323**	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: Rho (the correlation coefficient for the residual component) is not significant in any of the models. The likelihood-ratio test of rho also indicates that standard models (without the sample selection) could have been sufficient. However, as discussed by Balbo and Mills (2011a), the small sample used for this analysis increases the probability of type-2 error, and controlling for sample selection seems like the best option.

Source: Generations & Gender Survey, wave 1 and 2

These results seem to indicate that the decision to have a first child in Western Europe is positively influenced by both what their peers and family think, as well as their perceive ability to raise a child. When having a second child, these effects are positive but not significant. Unfortunately, due to small sample size for the latter group, it is not possible to make many assumptions based on this model for the realisation of intentions.

For Eastern Europe, the decision to have a first child seems to be mostly tied to marital status, with norms and perceived control having small and non-significant effects. It is possible that the expectation that a person will have a child is so high for this group, that the only factor that determines when to have this child is the availability of a partner. For having a second child, however, perceived control has a strong and positive effect, indicating that people only progress to this next parity if they feel like they have the means to raise them. The socioeconomic uncertainty of the region could then explain why so many people do not fulfil their intentions for a second child, as they never feel secure enough to do so. The fact that higher educated men and women have an increase probability of realising their positive intention for a second child also supports this fact.

It seems that first, when forming their intentions, people consider what the effect of having a child would be for their lives (benefits and costs), but when for actualising those intentions, they rely on more concrete ideas measured by their perceived control.

In addition, number of own siblings is also positively associated with realising this intention, despite not being significant for having a positive intention. It is possible that those that come from bigger families feel more pressure to also have a larger number of children when compared to those from smaller families, which means they may ignore certain socioeconomic constraints that others would not. Being a woman also has a negative effect on the realisation of intentions for Eastern Europe, which could be an

indication that women face extra barriers for the realisation of intentions when compared to men.

A limiting factor of this analysis is that it includes a broad age spectrum, of people aged 18-44 at the time of the first survey. It could be argued that short-term fertility intentions are less trustworthy for younger men and women as they may change their intentions as they get older. At the same time, studying only people closer to the end of their reproductive period could also reduce the number of those who still have positive fertility intentions, as they have already reached their desired fertility, or have forgone having more children due to their age.

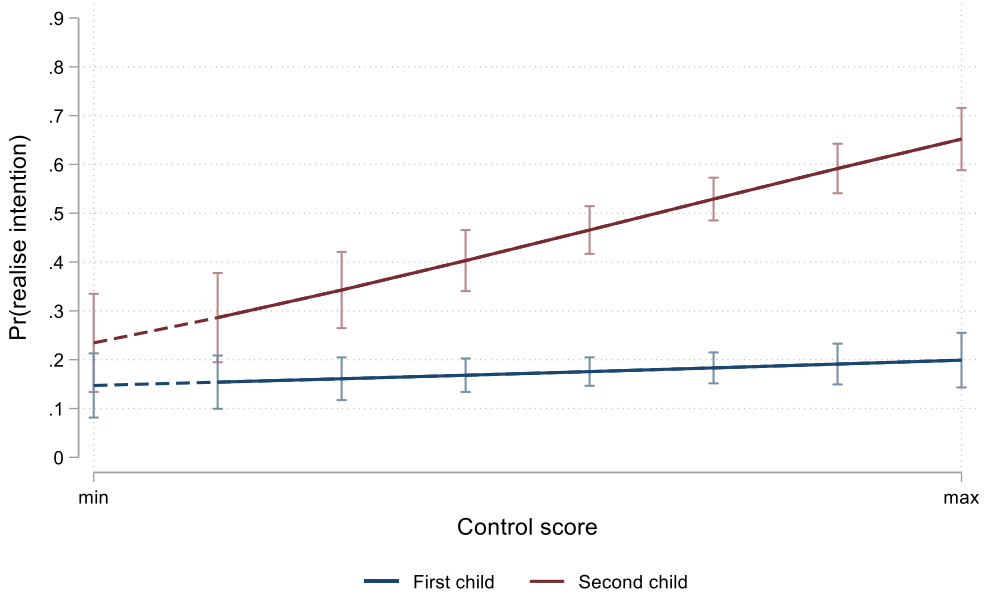
If we consider only those aged 35-44 for the analysis, it is hard to discuss significance of effects due to the very small same sizes in this dataset, however, we see generally similar effects to those presented for the full age range. The results can be seen on Tables B1 and B2 in Appendix B. Overall, there is a larger effect of subjective norms on realisation of intentions for Western Europe, and a negative effect for Eastern Europe. For intentions, perceived control is stronger, and benefits present a negative effect for both regions. These results could be indicating that as people reach their completed parity, social norms start to matter more as postponement of childbearing while waiting for possible improvements in socioeconomic conditions becomes less viable. In addition, it is possible that as people get older, they start seeing less benefits to having children, as that could drastically alter their way of life, and they may also encounter social scrutiny for having children past the normative age for childbearing. However, further studies with a larger sample size would be necessary to drawn any concrete conclusions from this analysis.

To further test the effects of subjective norms and perceived control for the realisation of intentions between a first and second child for Eastern Europe, a similar

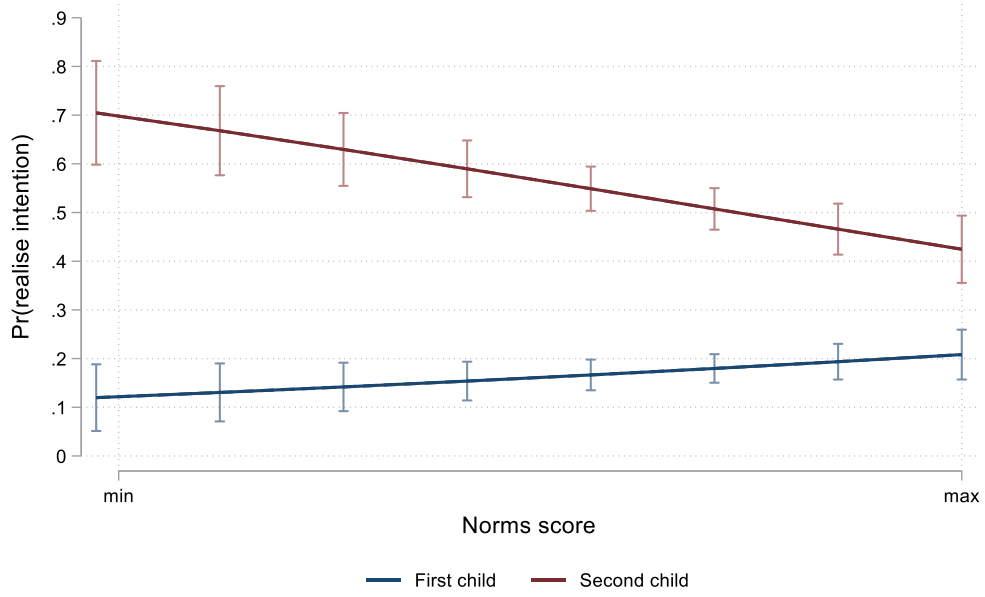
model was run with pooled data for both parities and an interaction effect between parity-norms and parity-control (Figures 3.7a and 3.7b).

Figure 3.7 Predicted probabilities (95% Cis) of realising fertility intentions to have a child in the next three years by parity for Eastern Europe, for perceived control (a) and subjective norms (b)

(a) Perceived control



(b) Subjective norms



Note: solid line indicates the difference between parities is significant (at p<0.05),
Source: Generations & Gender Survey, wave 1 and 2

The figures show, as was observed in Table 3.2a, that subjective norms have a negative effect and perceived control has a positive effect on realising intentions for a second child. The effect for a first child is positive, but smaller for both cases.

The third hypothesis expected norms to have a stronger and positive effect on the realisation of intentions for a first child than on the realisations for a second child. These results show that norms have, on average, a negative effect on realisations for a second child and a positive, but small, effect on a first child. This negative effect could be indicating the overall sentiment towards the socioeconomic difficulties of raising children in the region. It may be that people feel that having a child is a necessary life course step, and that is reflected in a social pressure to have a first child. However, due to the economic uncertainties and high cost of raising a child, people may be less inclined to have a second child themselves and the peer-pressure to then have a second child is lessened.

3.8. Discussion and conclusion

This chapter utilised data from the first two waves of the Generations & Gender Survey to explore men and women's fertility intentions and outcomes for having a first and second child in Europe. The analysis was focused on exploring the impact of people's attitudes, subjective norms and perceived control on their fertility behaviour. Due to different cultures, socioeconomic histories and overall fertility patterns, the analysis was done separately for Eastern and Western Europe, each region represented by two countries.

The main goal of this chapter was to better understand factors guiding the transition from childlessness and only-child fertility across Europe, to allow for a more informed discussion about how these outcomes are either functions of unrealised fertility intentions or conscious fertility choices. It builds on the findings of the previous chapter

about the heterogeneity of fertility outcomes between only-children and childlessness in the region.

The results show that while people seem to consider families and friends' opinions, and what they believe are the pros and cons of having a child for their fertility intentions, actually having a child is more guided by their financial and physiological conditions. This would explain the low rate of realisation of intentions, observed especially for the childless in Eastern Europe, as these people are usually younger, more likely to be single and less financially secure.

The results are in line with the findings in the literature such as Van Bavel and Nitsche (2013). In their paper, the authors look at how the believed "proper age for parenthood", as well as macro effects such as gross domestic product (GDP), affect second birth rates in Europe. They show that for Eastern and Southern Europe, due to the high value placed on parenthood, people only progress to a second child when they feel economically certain of their future (richer regions), as parenthood has already been achieved with a first child.

This chapter builds on- and strengthens this literature by looking at a similar relationship between fertility outcomes and cultural norms and socioeconomic status, but with a more micro perspective. The results presented here are complementary to previous findings, and contribute to the literature by showing that family and friends' opinions on a person's fertility, measured by the subjective norms, while important for fertility behaviours, are not as important as people's perceived socioeconomic capacity to raise children, measured by perceived control.

This chapter also complements the literature on the TPB and its uses for understanding fertility behaviours. The results show that, on one hand, this theory can provide useful insights when constructing a framework for understanding fertility

intentions. On the other hand, when dealing with the realisation of intentions, the background factors listed in the TPB conceptual model seem more directly impactful, as they are not completely accounted for in the measures of attitudes, subjective norms and perceived control.

Exploring fertility intentions is relevant for understanding how people feel about their future fertility or, at the very least, how they believe they should feel. The first hypothesis of this study argued that subjective norms would have the strongest impact on intentions in Eastern Europe, due to the culture surrounding family and fertility in the region. In contrast, people's perceived control and attitudes towards having children was expected to have a stronger effect in Western Europe. The results show similar effects for both regions, where benefits had the strongest positive effect, and costs had the strongest negative effect. However, the effect of norms was relatively stronger – in comparison to the effects of benefits and costs – in Eastern Europe.

Regarding the realisation of intentions, it was expected that people's perceived control over having children would have a positive effect on the probability of realising intentions, and that subjective norms would be more important for realising intentions to have a first child than to have a second child, according to the second and third hypothesis, respectively.

The results confirm the second hypothesis for those having a first child in Western Europe, and those having a second child in Eastern Europe. The effects were positive, but not significant for the other two groups. In contrast, subjective norms was only significant for those having a first child in Western Europe. Unfortunately, the models were limited in their explanatory power for the realisation of intentions for a second child in Western Europe.

Regarding the lack of effect of subjective norms on the realisation of intentions for Eastern Europe, it is possible that the near-universality of childbearing in the region, as childlessness prevalence if very low, leads to a situation in which the realisation of intentions is only limited by a person's physical ability to have children, as shown by the strong effect of marital status on the realisation of intentions for a first child. With the pooled model by parity, subjective norms showed a negative effect for a second child and a small but positive effect for a first child, and these results cannot confirm the third hypothesis.

The analysis in this chapter was faced with some limitations. In addition to the small sample size discussed previously, there are possible biases tied to the measurement of intentions. Fertility intentions can be considered a vague notion that is not necessarily a good predictor of behaviour. They may indicate that people want – or feel like they should want – a child, but people may not fully understand, or fully believe, the time frame given for the realisation of those intentions (Manski, 1990; Toulemon & Testa, 2005). However, as the discussion in this chapter has shown, it seems reasonable to assume that fertility intentions precede fertility behaviour in the majority of cases, and can still help us understand fertility patterns across different groups. With a third wave of the GGS being released soon, it would be interesting to follow these people who did not realise their intentions in the first three years and see if anything has changed since then.

Moreover, the analysis done in this chapter is based on short-term fertility intentions and outcomes, and it does not account for the full reproductive histories of the people in the dataset. For the younger people especially, it is possible that they consider their fertility intentions for the next three years as more malleable, which would make that information less reliable for predicting fertility outcomes. Additionally, even for older individuals, not realising fertility intentions within three years does not mean they

will not realise them later in life. It is also possible that some people would change their mind about their fertility intentions as they get older.

Doing an analysis of retrospective fertility could help with some of these limitations, but it would make the information on intentions less reliable, as people would be less likely to say a positive fertility outcome was undesired after the fact. Ideally, we would have information of short term fertility intentions over several waves, and would be able to capture what has changed between waves and how that has affected their intentions and outcomes. This might be possible to do as further waves of the GGS become available. Currently, while the results in this chapter are relevant for understanding short-term fertility outcomes, they cannot be extrapolated for understanding overall fertility outcomes, as they are likely underestimating both the intentions and realisation of positive fertility intentions in the long term (for example for those who might not want a child yet, but might want and might have one when they meet a suitable partner or reach their desired level of education).

Furthermore, the estimations were focused on people both in and out of unions, which didn't allow for inclusion of couple characteristics. This would be an interesting expansion of this research, with the data and sample size allowing, to better understand how people's views of their partner and overall home-life may impact their fertility intentions and behaviours. Moreover, because of the nature of the data, I cannot discuss causal influence on fertility intentions. Finally, acquiring data for more countries would allow for a better picture of the differences between Eastern and Western Europe.

Chapter 4

Better together? Exploring behavioural differences in children with and without siblings in the UK

4.1. Introduction

There are many myths about the behaviour of only-children and many negative stereotypes are widely believed about the consequences of growing up without siblings. Only-children are usually considered to be problematic, spoiled and to present selfish or anti-social behaviours (Falbo, 2020; Falbo & Polit, 1986; Mancillas, 2006). The continued persistence of these stereotypes over time can be seen as one of the reasons why only-children are not more common throughout history and why many parents decide to have a second child (Blake, 1981; Falbo & Polit, 1986; Laybourn, 1990).

Over the last few decades, quantitative and qualitative studies, both in the social and psychological sciences, have tested the veracity of these stereotypes. While some studies have found that only-children lag behind other children in social skills (Downey & Condron, 2004), most studies have contradicted the stereotypes and found only-children to either be similar to first-borns or to even present positive aspects when compared to their counterparts (Chen W. 2015; Chen X. et al. 1994; Choi and Monden 2017; Laybourn 1990; Mellor 1990).

However, past research still leaves gaps in our knowledge. First, most of the literature is focused on either the United States or China, which means that other cultural contexts were not thoroughly considered. Second, many previous studies come from the field of psychology, with different methodological approaches from sociodemographic studies, and have focused on small sample sizes or a population subgroup (for example, people with psychological problems) (Blake, 1981; Falbo & Polit, 1986; Falbo & Poston, 1993; Jiao et al., 1996; Poston & Falbo, 1990; Xiao et al., 2020). Finally, most studies

have either focused on a single cohort or a single age group, which doesn't allow for the exploration of behaviour changes over time. There have been studies showing that these behaviours stay consistent from young teens to adulthood (Rosenberg & Hyde, 1993), but younger formative years were not considered.

This chapter will expand on the current literature by studying behaviour differences between only-children and children with siblings in the United Kingdom. Data from the 2000's Millennium Cohort (MCS) will be used. This study will test 1) if there are any behaviour differences between only-children and children with siblings across different age groups and different types of behaviour; and 2) if these differences are consistent across age groups, from ages 3 to 14.

These stereotypes about only-children can have a real impact on observed fertility rates and family sizes, as couples decide to have a second child, or no child at all, to avoid having a "problematic" only-child. They also affect how only-children are treated in society and how they perceive themselves. This chapter hopes to further our understanding on this topic, so that we can have a better idea whether these beliefs are based in reality or not. The next section will lay out what the literature has found on this topic so far and why we could expect or not differences in behaviour between only-children and children with siblings.

4.2. Only-children: stereotypes and behaviours

The effects of birth-order on a child's behaviour have been a subject of study in the field of social psychology for decades. These studies have been at least partially motivated by stereotypes that have persisted over time, and even across different societies. For example, first-borns have consistently been seen as the more responsible sibling, and younger siblings are usually labelled as more rebellious (Paulhus et al., 1999).

Some of the most persistent negative stereotypes, however, seem to relate to being an only-child.

Only-children are seen as problematic, especially when regarding their ability to navigate peer relationships. They are often labelled as spoiled, selfish, anti-social or overall maladjusted. As discussed by Blake (1981), the presence of siblings is seen as having both positive and negative effects, but the lack of siblings is often only seen as a negative for the child's behaviour.

These stereotypes seem prevalent across different cultures, including the United States, and at least some parts of Europe and Asia. Mentions of these stereotypes can be found in the general public's discourse since early 20th century and they seem to have been popularized by pioneer psychologist Granville Stanley Hall who, in 1898, said that "being an only-child is a disease in itself" (cited in Fenton 1928; Mancillas 2006; Mõttus et al. 2008) and continued on the public's mind to this day, as it can be seen across online articles, maternity forum posts and help books on the "only-child syndrome".

When asked if being an only-child is an advantage or a disadvantage, the majority of respondents in the US in the 1950s and 1970s responded that it is a disadvantage (Blake, 1981). In the study, the author mentions that 60% of respondents cited only-children to be self-centred, domineering, anxious, quarrelsome, spoiled, or overprotected. An additional 22% said only-children have a lonely childhood (p. 43).

In an online study conducted in Germany, Dufner et al. (2020) found that, on average, people ascribe higher narcissistic admiration and narcissistic rivalry to only-children than to people with siblings. The authors also discuss how this specific stereotype has repeatedly been made both by researchers and in media reports. Similarly, for Estonia, Mõttus et al. (2008) show that only-children were rated as emotionally unstable, cold, hostile, uncaring, obstinate, and arrogant.

Baskett (1985) asked college students to rate people of different birth orders according to preselected adjectives, and only-children were rated as the most academic, but also the most spoiled and the least likeable. A study by Herrera et al. (2003) found that people's beliefs in personality differences according to birth rank showed "strong and consistent patterns, replicable over diverse populations", which could influence parent's expectations for their own children and of other people in general.

Parents can also feel pressured to have a second child, as they would otherwise risk being criticised for depriving their child of a sibling (Laybourn, 1990). As discussed by Falbo (1979), one of the major reasons cited by parents in the US for having a second child was to prevent the first-born from being an only-child.

One argument for why only-children would present different behaviours from children with siblings has to do with the different environments they may experience when growing up. As argued by Falbo (1979), a couple may not have been able to achieve higher parity due to divorce, and an only-child may be more likely to live between two homes, or without the presence of a father, which could negatively affect their behaviour and personality. Moreover, if having an only-child was a conscious choice, it may signify that the parents might present different family values and life-styles when compared to parents in a larger family. There is evidence that one-child homes are more adult-oriented than two or more child homes and that one-child mothers rate the rewards of parenting as less important than mothers with more children (Falbo, 1979).

The lack of siblings may also affect how only-children learn to interact with others. For example, they lack exposure to conflict management among peers (Mancillas, 2006). Additionally, only-children are the sole recipient of their parents expectations, which can also lead to negative consequences for the child's well-being (Gerhardt, 2016; Mancillas, 2006; Veenhoven & Verkuyten, 1989). A couple with one child might also be

stricter or more protective of their child than parents with more children (Falbo, 1979; Laybourn, 1990). As they grow older, adult only-children are also under the pressure of being the sole caretakers of their aging parents. Similarly, some only-children can also feel pressured to have children of their own to continue the family line and to give grandchildren to their parents (Laybourn, 1990; Roberts & Blanton, 2001).

Finally, the pervasiveness of the negative stereotypes about only-children can not only influence the way other people see only-children, but the way they see themselves, which could lead to negative effects on their self-esteem and a self-realisation of these stereotypes, regardless of them being originally true or not (Falbo, 1979; Mancillas, 2006).

Overall, the literature shows that only-children fare better in academic performance compared to their peers (Falbo, 2020; Gerhardt, 2016; Mancillas, 2006; Polit et al., 1980; Rochebrochard & Joshi, 2013; Shi et al., 2021; Tavares et al., 2004). Falbo (2020) discusses that the relative advantage of only-children in academic achievement increased with age, possibly reflecting the fact that only-children are more likely to go to college, as their parents have more resources to devote to their education. However, the author also shows that, only-children relative advantage in intelligence decreased with age.

Polit et al. (1980) examined a sample of 537 white middle-class married couples residing near Boston, USA. Compared with others, only-children were found to have higher educational levels and occupational status, to be more secular and to have smaller families. Female only-children were also more likely to be working, and to be more autonomous in deciding to work, as well as to have planned their families before marriage.

When looking at behaviour differences between only-children and children with siblings, results seem to contradict the stereotypes. Falbo and Polit (1986) conducted a meta-analysis on the literature on only-children across 115 studies and did not find any significant differences between only-children and other groups. However, they also caution against the wide variety of methodologies used in these studies, which could sometimes be conflicting. More recently, Mõttus et al. (2008) also found no differences in personality traits between only-children and others for their study in Estonia.

Glenn and Hoppe (1984) use data from 7 US national surveys to estimate the effect of number of siblings on eight dimensions of psychological well-being among white adults. They find that having siblings showed overall negative effects on well-being, contrary to what is expected from the stereotypes.

Gee (1991) compares adult women who are only-children and women who grew up with siblings in relation to life course characteristics (events and timing), using a random sample of Canadian women (birth cohorts 1905-29 and 1930-44) surveyed, by telephone, in Vancouver and Victoria (1251 women in total). Results showed differences between the two groups, but those differences were, for the most part, the result of family of origin variables associated with sibship size rather than the result of only-child status per se.

Falbo (2020) discusses previous studies on only-children in the USA, were the authors found that only-children present worse social interpersonal skills than their peers, however that difference disappears as they get older (Bobbitt-Zeher & Downey, 2013).

A lot of the recent literature on only-children is focused on China, and this has been a topic of academic study in the country for several decades due to the impact of the one-child policy. More recent studies seem find no difference between only-children and children with siblings regarding behaviour (Yang & Weng, 2021; Zheng et al., 2022),

while older studies, such as Jiao et al. (1996), found that only-children are more egocentric, whereas sibling children possess the positive qualities of persistence, cooperation, and peer prestige. (Wang et al., 2000) found, when looking at preschool aged children, that only-children exhibited more somatic complaints. Falbo (2020) discusses that over 100 studies focused on Chinese only-children have been published since the 1980s, and overall, only-children have presented lower levels of psychopathology than their peers with siblings. Due to the special circumstances surrounding the Chinese only-children, it is not possible to generalize these results to other contexts.

Therefore, if empirical results show that most of the only-children stereotypes are not exactly true, why have they persisted across time and across societies? Some authors, such as Blake (1981), have argued that the current studies might fail to measure the specifics aspects of an only-child's behaviour or personality that other people would consider unwanted or problematic. It is also possible, as the author puts it, that the societies that survived were ones with strong pro-natalist beliefs, which perpetuated a prejudice against smaller families.

Falbo (1979) also argues that when some negative behaviours, consistent with the only-children stereotypes, are observed on children with siblings, they are attributed as a result of some other cause, unrelated to sibship size. The author's results confirm this bias. Therefore, it is also possible that these negative behaviours exist equally across sibship sizes, but are only stigmatised on only-children.

Finally, it is also possible that only-children are becoming progressively more advantaged over time, as fertility decreases and this group becomes more heterogeneous, and negative behaviours that used to be common on only-children have been disappearing, while the stereotypes have continued (Blake, 1981, p. 53; Goisis et al., 2023). Similarly, parental behaviours that used to be much more common for only-

children, such as divorce or single-parenthood, are possibly now more common across the board.

Some older studies have also been criticised for methodological limitations, such as grouping only-children and first-borns from families of all sizes, focusing only on young children, basing their results on very small sample sizes, or studying only pre-selected groups, such as geniuses, inhabitants of mental institutions or alcoholics (Blake, 1981).

4.3. Only-child studies in the United Kingdom

While the literature on only-children continues to grow, so far it has mostly been focused on the USA and China contexts. While these studies bring important insights for understanding only-children, it is hard to generalise their findings to other countries due to socioeconomic and cultural particularities of each context, as contextual differences may lead to different only-children behaviours.

China is a very particular case, due to the only-child policy, which has led to a much higher prevalence of only-children compared to anywhere else in the world, as shown in chapter two. For one, this affects the way only-children are seen in society: them being more common, may mean they face less prejudice from adults and from their peers. They would also have more chances to interact with other only-children – in schools for example – in comparison to other societies, where only-children are rarer and having siblings is a much more common experience. With a policy-driven higher prevalence of only-children, only-child families would also be seen more commonly across different socioeconomic classes (although some families, especially in rural areas were allowed to have a second child, as discussed in Li & Cooney, 1993), when compared to other societies where only-children may have increased more organically. All these different

experiences could have an effect on their behaviour making it difficult to generalise studies of Chinese only-children to other countries.

The USA is also a particular context that may be hard to generalise. The higher cost of childcare, healthcare and difficulties surrounding parental leave could affect people's fertility planning and views on children. At the same time, the country has higher fertility than other developed countries (Kohler et al., 2006), and these factors would affect the environment children grow up in, how only-children are perceived in society and, consequently, their behaviour.

Expanding studies of only-children to different countries – and comparing the results – is important to help us understand particularities of each context, as well as how much of the observed only-child behaviours across societies are intrinsic to being an only-child and how much is driven by external factors.

Currently, there is a lack of studies of only-children for Europe in general, and the UK specifically. As fertility continues to decline in the UK, as in the rest of Europe, one-child families will likely continue to increase, making it increasingly important to contextualise them. The UK also has particularities that make understanding only-children uniquely interesting. Choi & Monden (2019) show that only-child families in the UK tend to be more socioeconomically advantaged than larger families, but less advantaged than two-child families, which could have important effects on a child's behaviour that wouldn't be seen in other contexts, where only-children come from more or less advantaged families. This could lead to interesting cross-country variations in only-child behaviours that are worth exploring.

Goisis et al. (2023) also highlight important specificities about only-children in the UK: the authors show that only-children in the UK are more likely to experience parental separation and grow up in a single-parent households when compared to children

of larger families. They also present an analysis across birth cohorts and argue that these "potentially disadvantaged circumstances" seem to be more common for more recent birth cohorts, and that even the observed advantage of only-children on cognitive abilities (compared to children from larger families), has been weaker for the most recent cohorts when compared to older cohorts. Additionally, their results show evidence that selection into being an only-child in the UK context has changed over time, which could mean a larger diversity and heterogeneity in behaviours of only-children in the country. These are all important aspects that make the UK a compelling case for studying only-child behaviour and for comparison with other countries.

Laybourn (1990) discusses how, at the time of his publication, there appeared to be no specific British research on only-children. The author discusses how we "do not know who they are, how they situation has arisen (choice or necessity), how they feel about their status […] and in what ways it differs […] from that of families with more than one child" (p. 393). Laybourn then uses the Scottish Young Peoples Survey, which takes a 10% sample of all Scottish youth in the late 1980s, to analyse the well-being of 16-17 year old only-children. In the sample, 6% of the young people in the cohort were only-children according to the author, compared to 38% of two-child families. Many of the only-children came from single-parent households, similar to studies found about the USA. However, the author highlights that, in contract with the USA, most mothers of only-children did not have a higher than average educational level. Despite this, the results found only-children to be well-adjusted overall: they were the least likely of any family size to "have truanted in their fourth year at school", and the most likely to "have felt the past six months to be worthwhile". They were also almost as likely as children from two-child families to be in full time education and the least likely, together with those from two-child families, to be unemployed.

Rochebrochard and Joshi (2013) used data from the MCS to do a descriptive analysis of children's development at ages 3, 5 and 7, using data on the cognitive and behaviour scores. Only-children fared better in some behaviour scores (conduct and prosocial), and worse in others (hyperactivity, peer relations, emotional) for ages 3 and 5 when compared to children with 1 sibling, but the advantage seemed to diminish or disappear at age 7. The authors argue that "the apparent 'disadvantages' of being an only-child could reflect factors which select their parents out of further childbearing". (p. 286).

More recently, Chanfreau et al. (2022) and Chanfreau and Goisis (2022b) have used data from several British cohort studies to look at differences in BMI over the life course by sibship size and patterns of care for older parents by adult only-children, in the first and second paper, respectively. The first paper shows very small differences in BMI between only-children and children with siblings, limited to school age children and adolescents. The second paper discusses how the study of only-children has been mostly focused on the childhood stage so far, and adds to the literature by exploring only-children later in life. The results show that only-children are more likely to provide parent-care at any age and that care-giving differences by sibship size might increase with age.

This chapter will expand the British literature (and the literature on only-children overall) by providing a more recent analysis of the only-children's behaviour in the UK, as it continues what Laybourn started by updating the demographics of British only-children. Similarly to the analysis by Rochebrochard and Joshi (2013), I use the MCS to look at the behaviour of only-children, but we are now also able to analyse children of ages 11 and 14.

4.4. Hypotheses

Based on the previous discussion, some hypotheses were formulated to guide this study. If the stereotypes are accurate, we can expect only-children to perform worse than

children with siblings in their behaviour scores, especially in relation to peer (how they interact with others) and prosocial behaviour (willingness to share, being considerate of others etc). According to the literature, only-children are seen to behave similarly to children with siblings, with a possible exception being related to social interactions. With that in mind, I expect that **H1)** only-children will present higher chance of having abnormal peer and prosocial behaviours than children with siblings, across all age groups.

In addition, some of the literature discusses how certain behaviours differences may disappear as children get older, as only-children are able to socialise more with their peers and become more similar to children with siblings, who had this learning experience earlier in life. Therefore, I expect that **H2)** the behaviour differences between only-children and children with siblings will become smaller with age (in later waves of the survey when compared earlier waves).

4.5. Data and Methods

4.5.1. Data

For this chapter, data from the Millennium Cohort Study (MCS) will be used. This study is administered by the Centre for Longitudinal Studies (CLS)[12]. The MCS based their sample on babies born in the UK over 12 months, beginning 1 September 2000 in England and Wales and 1 December 2000 in Scotland and Northern Ireland.

The survey follows the lives of these children over several waves (also called sweeps). They cover several topics, including the child's behaviour, cognitive development, identity and education. At the moment of writing, the MCS has had 7 waves. The MCS originally covered around 19,000 children, although only around 55%

[12] The data comes from the Centre for Longitudinal Studies (CLS) and UCL Social Research Institute, made available by the UK Data Service. Neither CLS nor the UK Data Service bear any responsibility for the analysis or interpretation of these data.

of the original sample stayed until age 17. Table 4.1 presents the average age of the cohort members at each wave of the MCS.

Table 4.1 Descriptives of the MCS waves

MCS	Cohort Members' Average age
MCS 1	9 months
MCS 2	3 years
MCS 3	5 years
MCS 4	7 years
MCS 5	11 years
MCS 6	14 years
MCS 7	17 years

Source: created by the author based on the CLS data

A limitation with this dataset is that it does not ask directly how many siblings the cohort member has. The survey only asks how many siblings the cohort member has *living in the household.* Therefore, we might miss siblings who are living in another household (as expected, the number of reported siblings decreases as children get older).

To reduce the risk of over counting only-children in the later waves, I assume that a child does not have any siblings if they never had a (full, half, step or adoptive) sibling living in the household by age 11 (wave 5). Similarly, I assume that the number of siblings recorded at these ages cannot decrease for later ages. If a child has lived the first 11 years of their live without a sibling in the same household, it seems accurate to assume that they've experienced childhood as an only-child and their behaviour would also reflect that of an only-child – as discussed in the introductory chapter about the difficulties of defining only-children.

This method for identifying only-children seems to yield similar results to the definition of only-children based on the mother's fertility (Chanfreau & Goisis, 2022a). A limitation of this definition, however, is that it ignores half-siblings from the father's

perspective, if the parents are separated and the child lives with their mother, which is more common for only-children as it will be shown later in the chapter.

4.5.2. Behaviour measures and sample size

The MCS has measures of the child's behaviour through a guardian's response to a standard questionnaire. The MCS uses the Strengths and Difficulties Questionnaire (SDQ), which includes 25 questions, shown in the Table 4.2.

The answers to the questions are recoded as 0, 1 and 2 based on the answers "not true", "somewhat true" or "certainly true", where the highest score equates to the biggest behaviour difficulties. The scores are summed and categorised based on a suggested scale from "Normal", "Borderline" or "Abnormal", where normal correspond to the top 80% of children in the full sample population, borderline would be the following 10% and abnormal would be the bottom 10%[13]. In addition to the total score, there are also five subcategories. The final SDQ score includes only the first four subcategories, excluding the "prosocial scale".

The SDQ scores can be analysed as continuous variables, which go from 0-10 for each behaviour sub-type and 0-40 for the total SDQ score (since it does not include the prosocial scale); or as categorical variables relating to normal/abnormal behaviours. For this analysis, the later was chosen as a way to highlight those who fall into the borderline/abnormal behaviour categories for only-children and children with siblings – meaning, how being an only-child can increase or decrease the chances of presenting abnormal behaviours, compared to those with siblings. This is driven by the discussion on the negative stereotypes that tie only-children to having higher chance of presenting negative behaviours. However, an analysis of the continuous scores can be interesting to

[13] More information on the scoring and sample used for the categories can be found on the SDQ website: https://www.sdqinfo.org/py/sdqinfo/b3.py?language=Englishqz(UK)

show how being an only-child can have a positive or negative effect on the behaviour scores. For that reason, a test with a continuous score and a linear regression model was added to Appendix C.

Table 4.2 Questions for "Is/does the child" answered by the mother in MCS (strengths and Difficulties Scale)

	Strengths and Difficulties Scale
Emotional	Often complains of headaches Have many worries Often unhappy, downhearted Nervous or clingy in new situations Have many fears, easily scared
Conduct	Often has temper tantrums Generally obedient Often Fights with other children Often lies or cheats Steal from home, school or elsewhere
Hyperactivity	Restless, overactive Constantly fidgeting or squirming Easily distracted, concentration wanders Thinks things out before acting Sees tasks through the end
Peer	Rather solitary, tends to play alone Has at least one good friend Generally liked by other children Picked on or bullied Get on better with adults than with children
Prosocial	Considerate of other people's feelings Share readily with other children Helpful if someone is hurt Kind to younger children Often volunteers to help others

Source: created by the author based on the CLS data

The questionnaire is filled out by the cohort member's parent, where the main respondent is the natural mother in the great majority (96%) of cases. To keep consistency, twins were excluded from the sample (less than 2%).

The analysis of behaviours is focused on ages 3-14 (waves 2-6). In the first wave, children were too young for behaviours to be accessed; and during the last wave, at ages 17, many children have left the survey and a significant number of the ones who stayed do not live with their parents anymore, and the mother would then not be asked about the child's behaviour.

The total sample is presented in Table 4.3. The percentage of only-children observed in this survey is somewhat in line, although a bit smaller, than what is found based on ONS data, where 18% of women in the 1970 British cohort had one child, which corresponds to around 9% of children being an only-child according to calculations by Chanfreau and Goisis (2022a). The percentage of women with an only-child seems to be in line with the rest of Europe, as discussed in the previous chapters.

Table 4.3 MCS Sample size

wave	Has siblings	Only-Child	% only-children in total sample
1	10,547	7,642	42.01
2	7,452	2,520	25.27
3	9,516	1,864	16.38
4	9,448	1,308	12.16
5	10,180	942	8.47
6	8,928	779	8.03
7	6,155 (4,458)	566 (370)	8.42 (7.66)

Note: The values in parentheses represent those who have behaviour information in all 7 waves

Source: created by the author based on the CLS data

From Table 4.3 we can also see a significant drop in the sample size between waves 6 and 7. A lot of teens in wave 7 are also missing data on their behaviour scores.

This is due to the fact that a good number of cohort members no longer live in the same household as their parents at this age, and the behaviour response used in the analysis was collected from parents in the same household as the cohort member. Therefore, information from wave 7 is not used in this study.

Due to missing responses to the behaviour variables in some waves but not in others, there is some variability in the sample sizes between waves. Specifically between waves 2 and 3, there is an increase in the sample size due to the fact that those who did not respond the questionnaire in wave 2, but did participate in wave 1, were given the opportunity to re-join the survey in wave 3.

It is possible that those with missing responses, or those who left the survey early, would also be the ones more likely to have abnormal behaviours. This would be the case if people left the survey due to circumstances such as health issues, time constraints, or major life events (e.g. death in the family, job change etc.), which could also negatively affect the relationship between the parents and the child and the child's environment growing up. However, it is possible that this would not greatly affect the results if this relationship acted similarly for both only-children and children with siblings. A sensitivity analysis was done including only those families who participated in all waves of the survey to test the effect of this variation in the sample (presented in Appendix C). The table shows similar results to the full analysis, with some differences for the significance of the effects.

Table 4.3 also highlights the small number of only-children in the sample. To deal with small sample limitations, the main analysis of the chapter is done with a cross-sectional perspective, where children who currently have no siblings, but might have siblings in a future wave, will still be considered only-children for that wave's analysis.

4.5.3. Analytical strategy

For testing the chance of having abnormal behaviours for only-children and children with siblings, a series of logistic models will be used, with data from the 2nd-6th wave of the MCS. Separate models are run for each subcategory of behaviour, which are codded as having normal or abnormal behaviour (which includes those classified with borderline or abnormal behaviour). These are measured at every wave, apart from wave one, as the children were too young.

The main independent variable is a dummy for "being an only-child" (0 = has sibling(s), 1 = only-child). The other controls are cohort member's sex, whether father resides in the household (measured at each wave), mother's age at birth of cohort member, mother's employment (measured at each wave) and mother's religion (measured at each wave). Mother's employment was missing in the third wave and therefore, it was assumed the same employment as wave 2.

These controls were chosen based on the literature to take into account the child's socioeconomic status and household dynamics that can impact their behaviour. The child's gender can affect how they are treated by their parent(s), their peers and overall society, which can have an impact on their well-being and behaviour. The possible impacts of parental divorce and single-parenthood on a child's well-being is also well-documented (Dunn et al., 1998; Sirvanli-Ozen, 2005; van Dijk et al., 2020). Finally, sociodemographic characteristics of the mother can also influence household dynamics and may inform a child's behaviour.

As discussed in the literature review, the factors that may lead someone to being an only-child could also be factors that affect their behaviour. For example, union breakdown, leading to a non-resident father, could limit parental fertility and ultimately lead to an only child, and at the same time have an effect on a child's well-being. Similarly, an older mother's age at birth could be a fertility limiting factor at the same

time that it can have an effect on the child's environment growing up, which may ultimately shape their behaviour.

Disentangling these effects can be tricky, but is also important for understanding the causes of the behaviour differences we may observe between only-children and children with siblings. The analysis in this chapter tries to limit the effect of this selection issue by controlling for some of these factors. In addition to the analysis with and without controls, a separate analysis is done only for those with resident father for both only-children and children with siblings, as a way to try to separate the possible "only-child effect" on behaviour from an underlying "union breakdown effect".

Models are run for each wave separately. In addition, to allow for a comparison of effects between waves, a pooled data analysis with all waves (2-6) was run with an interaction effect between being an only-child and survey wave (with wave as a categorical variable, where wave 2 is the reference category). This is specified in Equation 4.1. Average marginal effects were used to calculate the effects across waves.

$$Logit(bhvr) = \beta_0 + \beta_1 onlychild + \beta_2 wave_3 + \cdots + \beta_5 wave_6 + \beta_6 onlychild * wave_3 + \cdots + \beta_9 onlychild * wave_6 + \beta_{10} X_1 + \cdots + \beta_n X_n + \varepsilon_{it}$$

(Equation 4.1)

Where *bhvr* represents the abnormal behaviour in question, *onlychild* is a binary outcome for being an only-child, *wave3-wave6* represent dummy variables for the categories of survey wave, *onlychild*wave* represent the interaction effects between being an only-child and each survey wave, and X1-Xn represents the controls. β0 is the intercept, β1- βn are the predicted coefficients and ε is the error term. This model is run for each of the behaviour types. Sample weights were used for the analyses.

4.6. Parental characteristics

Descriptive differences can be observed between only-children and children with siblings relative to their parent's characteristics (Table 4.4). Mothers of only-children have an older average age at first birth (specifically for this measure, it compares only those who are only-children through all waves and firstborns who will eventually have siblings) and a higher proportion of them are employed (in all waves), when compared to mothers of multiple children. The percentage of employed mothers increases as children get older, which would signify women going back to work after their child is old enough, however the proportions are consistently higher for mothers of only-children.

Table 4.4 MCS Parental characteristics for wave 1 and wave 6

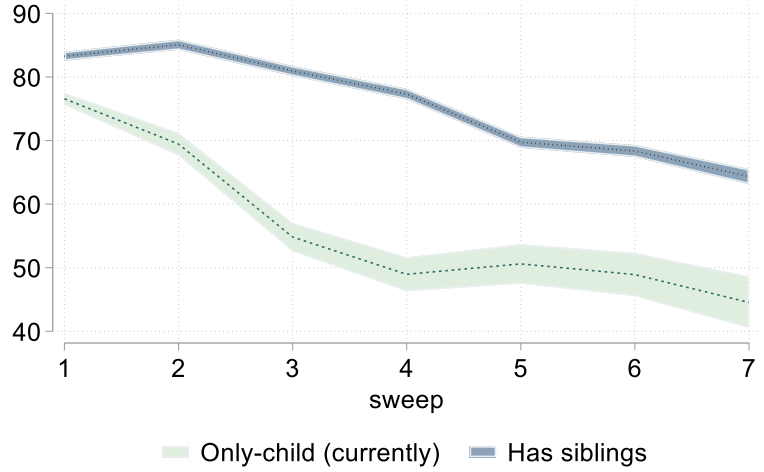
	Wave 1		Wave 6	
Variable	**Only-Child**	**Has Siblings**	**Only-Child**	**Has Siblings**
Mother's average age at birth	26.77	25.7	-	-
% of mothers who are employed	59.01	45.47	86.7	76.48
% of mothers who are religious	50.84	56.33	39.92	49.13
% of mothers who are white	90.25	88.24	92.74	89.03
% of resident fathers	81.06	86.32	51.46	69.06
Sex ratio	0.48	0.48	0.5	0.49

Source: created by the author based on the MCS data

Mothers of multiple children also tend to be more religious and to be white, although the majority in both groups is non-religious and white. There is a noticeable reduction in religious mothers between waves 1 and 6, especially for mothers of only-children. This drop persists even if we only consider those families that have stayed in the survey for all waves. This seems to be indicating a change in religious stance for women in the UK, which is in line with what has been observed by the ONS: between the censuses of 2011 and 2021, the proportion of people declaring "no religion" has increased from around 25% to 37% (ONS Census of England and Wales 2011 and 2021).

From Table 4.4, we also notice the striking difference in resident fathers between children with and without siblings. According to the 2022 Children's Commissioner Report, 23% of families with children in the UK were headed by a lone parent, with 90% of them women. Parental composition, as discussed in the literature, can be an important factor in determining children's behaviours. Only-children also have, on average, a smaller percentage of resident fathers across their childhood when compared to their counterparts, possibly indicating single-parenthood or marital breakdown (Figure 4.1).

Figure 4.1 Proportion of cohort members with a resident father by wave



Source: created by the author based on the MCS data

4.7. Results: Children's behaviours

Table 4.5 presents the odds ratios of being an only-child (when compared to having siblings, the reference category) for having abnormal behaviours and behaviour type for children in the MCS separately by wave.

The results show no significant difference in the SDQ total score for most waves, but when we look at the sub-categories of behaviour, we can see interesting differences between only-children and children with siblings. Only-children have a higher chance of presenting abnormal peer behaviour in all waves and a lower chance of presenting

conduct problems, when compared to children with siblings. Only-children also present a consistently lower chance of having pro-social behaviour problems than children with siblings.

These results are in line with the first hypothesis, showing that there might be some truth to stereotypes that indicate only-children have more noticeable problems interacting with other children. At the same time, the results also show positive results relative to conduct and pro-social score, which are not usually brought up when people discuss only-children, reinforcing the literature discussion on the societal bias against only-children, as only the negative aspects tend to come up in casual discussions of these children.

Table 4.5 Odds Ratio of having abnormal behaviours for only-children, compared to children with siblings, by wave and behaviour type

	Odds Ratios				
	wave 2	**wave 3**	**wave 4**	**wave 5**	**wave 6**
SDQ total score	0.849**	1.014	0.996	1.146	1.096
	(0.0635)	(0.0918)	(0.111)	(0.126)	(0.136)
Peer score	1.178**	1.436***	1.488***	1.682***	1.536***
	(0.0843)	(0.121)	(0.151)	(0.166)	(0.152)
Hyperactivity score	0.818**	1.014	1.203**	0.942	0.980
	(0.0657)	(0.0867)	(0.102)	(0.105)	(0.137)
Emotional score	0.791***	1.017	0.957	1.060	1.247**
	(0.0696)	(0.122)	(0.117)	(0.0920)	(0.128)
Conduct score	0.699***	0.643***	0.720***	0.696***	0.739**
	(0.0470)	(0.0515)	(0.0718)	(0.0821)	(0.102)
Pro-social score		0.715**	0.836	0.627**	0.819
		(0.100)	(0.152)	(0.145)	(0.147)
Total Observations	**9,595**	**11,000**	**10,403**	**10,765**	**9,372**

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: controls not presented in this table for better visualisation. Full regression tables can be found in Appendix C.

Source: created by the author based on the MCS data

The hyperactivity and emotional scores vary by wave, however only-children present a higher and significant chance of presenting emotional problems in wave 6, when these children are 14 years old. Although we cannot know this from these results, it is possible that either the lack of siblings or, on the other hand, the negative view and prejudice against only-children, may have had an impact on them and lead to negative emotional outcomes as they approach adolescence.

When we consider the unadjusted odds-ratios of being an only-child (no controls), the results are similar but with some noticeable differences (Table C10 presented in Appendix C). Specifically, the odds ratios for the SDQ score in wave 2 becomes non-significant with a reversal in the direction of the effect (the value becomes greater than 1), the effect is also significant and indicates a positive association for waves 3 and 4. The results for the peer score generally increase in magnitude, and the ones for conduct become less significant and with a weaker negative association. This shows that, while the controls added to the analyses in Table 4.5 are relevant for the analysis, most of the significant association observed, especially for the peer and conduct scores, still remain in the unadjusted regressions. This is indicating that the observed association may be a characteristic of being an only-child (or having siblings), more so than a result of other environmental factors, and further analyses are needed into this association.

One factor that could influence behaviour is birth order. Regardless of number of siblings, the literature has shown the importance of birth order for cognitive ability (Barclay, 2015). When we consider only firstborns in the analysis, compared to only-children, the results are similar to the ones presented previously (Table 4.6): only-children have much higher odds of presenting abnormal peer behaviour when compared to firstborns. However, there is mostly no significant difference in the conduct score. This

means that the conduct behaviour advantage observed for only-children in the previous analysis is not present when we compare them to a group that is also considered more advantaged among its siblings. This indicates that some of the conduct behaviour differences observed in the previous analysis are more closely related to being born later in the birth order, rather than necessarily just having siblings.

Table 4.6 Odds Ratio of having abnormal behaviour for only-children, compared to *firstborn* children with siblings, by wave and behaviour problem, abridged table (omitted controls)

	wave 2	wave 3	wave 4	wave 5	wave 6
SDQ total score	1.242**	1.138	1.149	1.152	1.307**
	(0.135)	(0.141)	(0.153)	(0.141)	(0.166)
Peer score	1.302**	1.506***	1.509***	1.605***	1.638***
	(0.133)	(0.153)	(0.188)	(0.164)	(0.178)
Hyperactivity score	1.137	1.109	1.436***	1.087	1.236
	(0.138)	(0.127)	(0.149)	(0.132)	(0.174)
Emotional score	0.785**	0.933	0.886	1.119	1.557***
	(0.0909)	(0.133)	(0.118)	(0.119)	(0.177)
Conduct score	0.975	0.924	0.873	0.778**	0.807
	(0.0916)	(0.0981)	(0.101)	(0.0972)	(0.112)
Pro-social score	0.892	0.920	0.841	0.425***	0.617***
	(0.0782)	(0.142)	(0.177)	(0.102)	(0.114)
Total Observations	**4,121**	**4,717**	**4,402**	**4,538**	**3,990**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: created by the author based on the MCS data

To consider the possible differences related to sibship size, a separate analysis also compared only-children with those from smaller families (one sibling) and those from larger families (two or more siblings). The results are shown in tables 4.7 and 4.8. In both cases, the peer and conduct differences observed in the grouped results remain.

In the comparison with those with one sibling, the peer scores show a very strong and positive association, indicating that only-children are especially more likely to present abnormal behaviour in comparison with this group. When looking at the comparison with those with two or more siblings, the association in the conduct scores stands out, indicating that these children from larger families have much higher odds of presenting abnormal behaviour than only-children.

Table 4.7 Odds Ratio of having abnormal behaviour for only-children, compared to children with *1 sibling*, by wave and behaviour problem, abridged table (omitted controls)

	wave 2	**wave 3**	**wave 4**	**wave 5**	**wave 6**
SDQ total score	0.949 (0.0792)	1.209 (0.142)	1.144 (0.139)	1.168 (0.135)	1.301* (0.187)
Peer score	1.252*** (0.0973)	1.643*** (0.151)	1.706*** (0.183)	1.722*** (0.170)	1.646*** (0.175)
Hyperactivity score	0.849* (0.0763)	1.082 (0.0998)	1.218** (0.109)	0.988 (0.112)	1.074 (0.164)
Emotional score	0.851* (0.0803)	1.178 (0.159)	1.041 (0.130)	1.087 (0.105)	1.334** (0.151)
Conduct score	0.744*** (0.0542)	0.707*** (0.0644)	0.743*** (0.0785)	0.770** (0.0917)	0.843 (0.126)
Pro-social score	0.772*** (0.0567)	0.807 (0.124)	0.894 (0.174)	0.798 (0.170)	0.883 (0.166)
Total Observations	**6,859**	**6,985**	**6,011**	**5,555**	**4,675**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: created by the author based on the MCS data

Overall, these results indicate that both birth order and sibship size are important when considering children's behaviour. However, in all cases only-children maintain their disadvantage for peer-relationship behaviours. Having siblings has generally a negative effect on conduct scores, unless it is the firstborn, when compared to only-children.

Table 4.8 Odds Ratio of having abnormal behaviour for only-children, compared to children with *2 or more siblings*, by wave and behaviour problem, abridged table (omitted controls)

	wave 2	**wave 3**	**wave 4**	**wave 5**	**wave 6**
SDQ total score	0.676***	0.766***	0.885	1.106	0.966
	(0.0679)	(0.0783)	(0.107)	(0.122)	(0.121)
Peer score	1.017	1.235**	1.384***	1.696***	1.451***
	(0.0930)	(0.124)	(0.158)	(0.173)	(0.155)
Hyperactivity score	0.730***	0.849	1.203*	0.960	0.913
	(0.0804)	(0.0868)	(0.122)	(0.108)	(0.132)
Emotional score	0.745**	0.879	0.865	0.997	1.161
	(0.0856)	(0.115)	(0.117)	(0.0917)	(0.131)
Conduct score	0.593***	0.528***	0.674***	0.656***	0.667***
	(0.0494)	(0.0468)	(0.0717)	(0.0768)	(0.0946)
Pro-social score	0.688***	0.545***	0.707	0.631*	0.768
	(0.0540)	(0.0893)	(0.151)	(0.151)	(0.141)
Total Observations	**5,131**	**5,748**	**5,630**	**6,205**	**5457**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: created by the author based on the MCS data

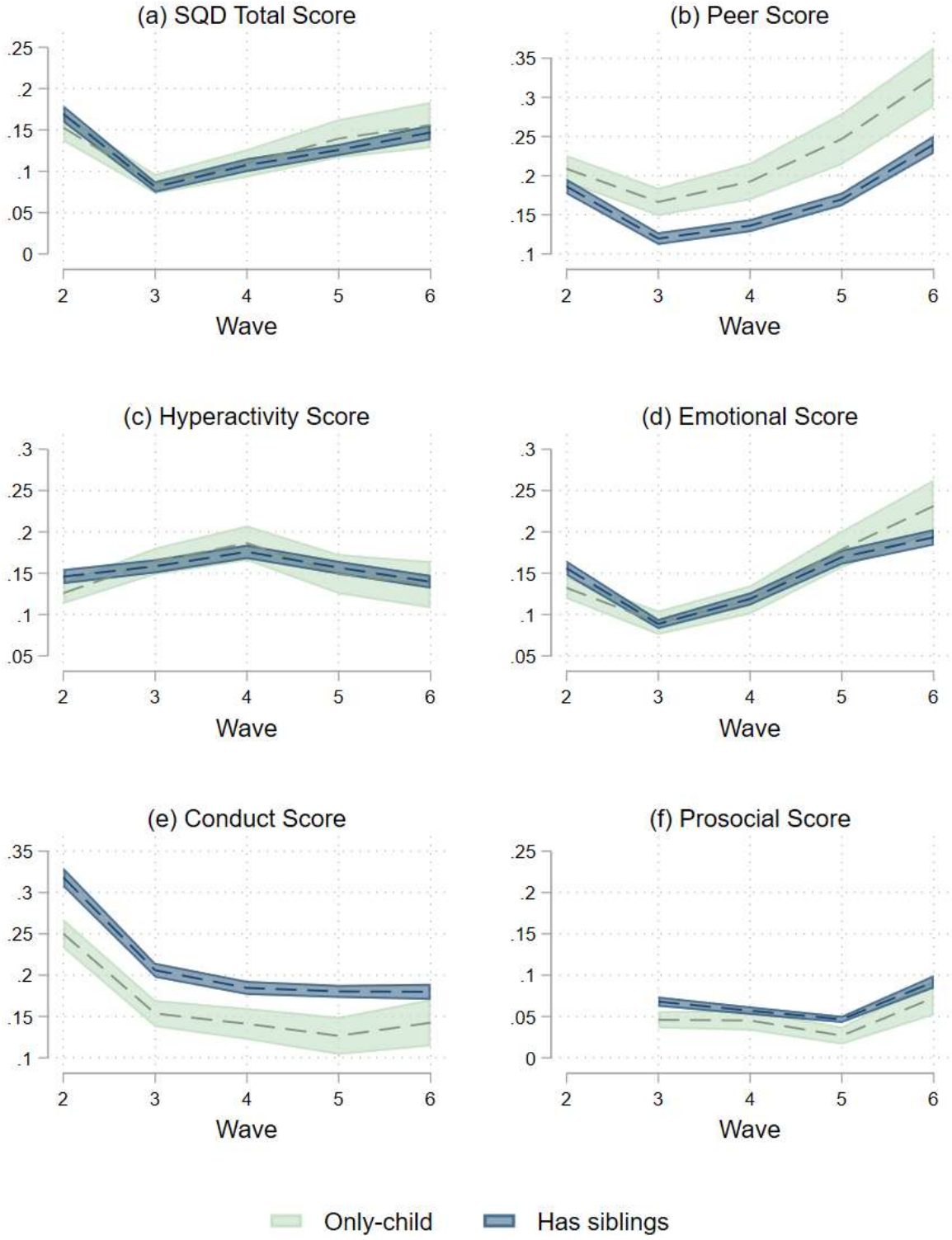
If we compare those with one sibling with those with two or more (Table C11 in Appendix C), the former are less likely to present overall abnormal behaviour (total SDQ

score), as well as peer, conduct, pro-social and emotional behaviour. This strengthens the idea discussed previously that many of the negative behaviours usually tied to only-children can be observed in children from larger families, but they are usually discounted as a consequence of another factor, unrelated to sibship size. Overall, it seems that being from a smaller family – be it an only-child or a two-child family – leads to smaller chance of abnormal behaviour, and especially being the firstborn. This comparison also helps to contextualise the differences observed between only-children and children with siblings, especially regarding the magnitude of differences in peer behaviour, which are much larger for only-children (varying from 1.25 to 1.72 odds ratios across waves) than for those with two or more siblings (varying from 1 to 1.31), when comparing them with those with one sibling.

To further explore how behaviour may change as children grow older, an additional analysis was done with pooled data for all waves, with an interaction effect between wave and being an only-child. Figure 4.2 presents the predicted probabilities (with 95% confidence intervals) of having abnormal behaviour for only-children and children with siblings across waves 2-6 of the MCS, based on these pooled logistic regressions.

Both only-children and children with siblings present around the expected percentage of abnormal behaviours (10-20%). The results highlight the differences in peer and conduct behaviours between only-children and children with siblings, as observed in the analysis for each wave separately. Only-children present a higher than the mean probability of having abnormal peer behaviour for all waves, while those with siblings present a lower probability, but only lower than the mean for waves 5 and 6. Conversely, for abnormal conduct behaviour, only-children present probabilities lower than the mean, and those with siblings present a higher than the mean probabilities across all waves.

Figure 4.2 Predicted probabilities (with 95% CIs) of having abnormal behaviours for only-children and children with siblings, across waves and behaviour type



Notes: 1) The full regression table can be found in Appendix C. 2) The y-axis has the same range for all sub-graphs, but different values to facilitate visualisation. 3) The analysis for pro-social behaviour in wave 2 was not considered due this measure being inconsistent for children at that age.

Source: created by the author based on the MCS data

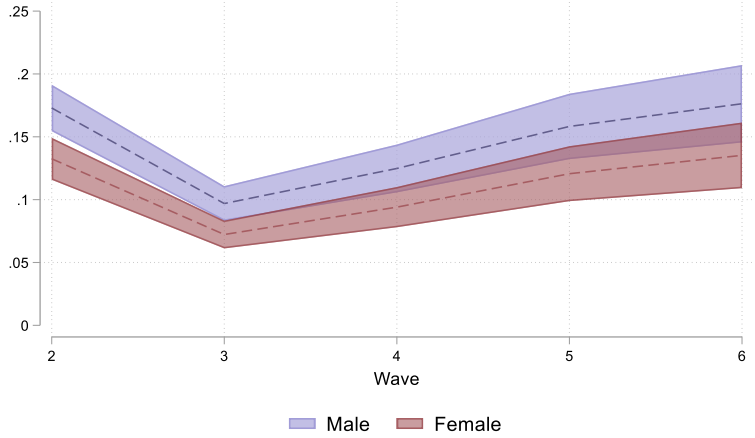
Looking at the changes as children get older, we notice that the prevalence of overall abnormal behaviours (SDQ score), as well as peer and emotional problems, increases for both groups of children from age 5 onwards (wave 3), indicating that the difficulties of adolescence are present regardless of sibship size. Abnormal conduct scores, on the other hand, overall decrease with age, with the biggest decrease happening between ages 3 and 5 (waves 2-3).

Based on the literature discussion, we could also expect that only-children and children with siblings would become more similar over time, especially as only-children enter school and start interacting more with other children their age. These figures show that both groups of children follow a similar trajectory as they get older regarding their behaviour.

Results from first and second difference tests (tables for peer and conduct scores presented in Appendix C) show that there is a significant gap between only-children and children with siblings in all waves, but these gaps don't significantly change across waves. Therefore, the second hypothesis of this study, which states that the behaviour differences between only-children and children with siblings will become smaller with age cannot be confirmed by these results.

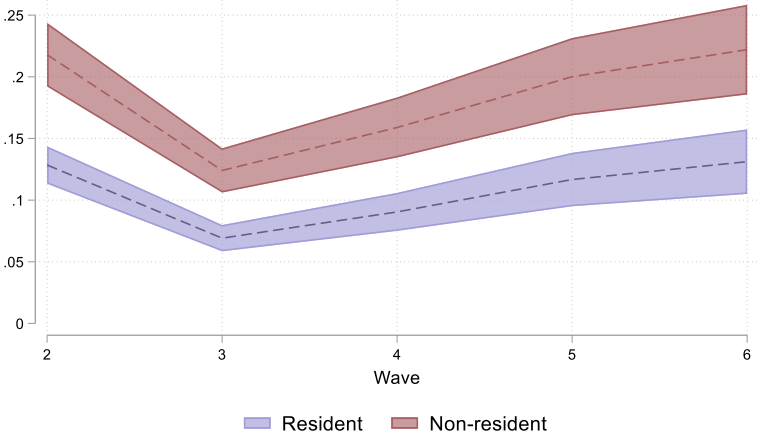
We can also see differences in behaviour within the only-child group. Figures 4.3 and 4.4 show the predicted probabilities separated by sex and resident father, respectively, for the total SDQ score for only-children across waves. Generally, being a men and not having a resident father increases the chances of having abnormal behaviour. The exception being emotional problems, which are higher for women at all waves, although the difference is not significant between men and women. These patterns, however are not exclusive to only-children, as we notice similar differences for children with siblings.

Figure 4.3 Predicted probabilities (with 95% confidence intervals) of having abnormal behaviours for only-children, by sex across waves



Source: created by the author based on the MCS data

Figure 4.4 Predicted probabilities (with 95% confidence intervals) of having abnormal behaviours for only-children, by resident father across waves



Source: created by the author based on the MCS data

Continuing to think about the possible effect of environmental factors on the association at hand, when we consider the pathways into having an only-child, union breakdown is often brought as a reason why some people were unable to have more children. This is seen in Figure 4.1, which shows that a larger proportion of only-children don't have a resident father when compared to those with siblings. As discussed in the literature, the lack of a resident father (be it do to parental divorce, widowhood or single-parenthood) presents a negative association with the child's behaviour. Therefore, it is possible that some of the behaviour differences observed in this chapter are not

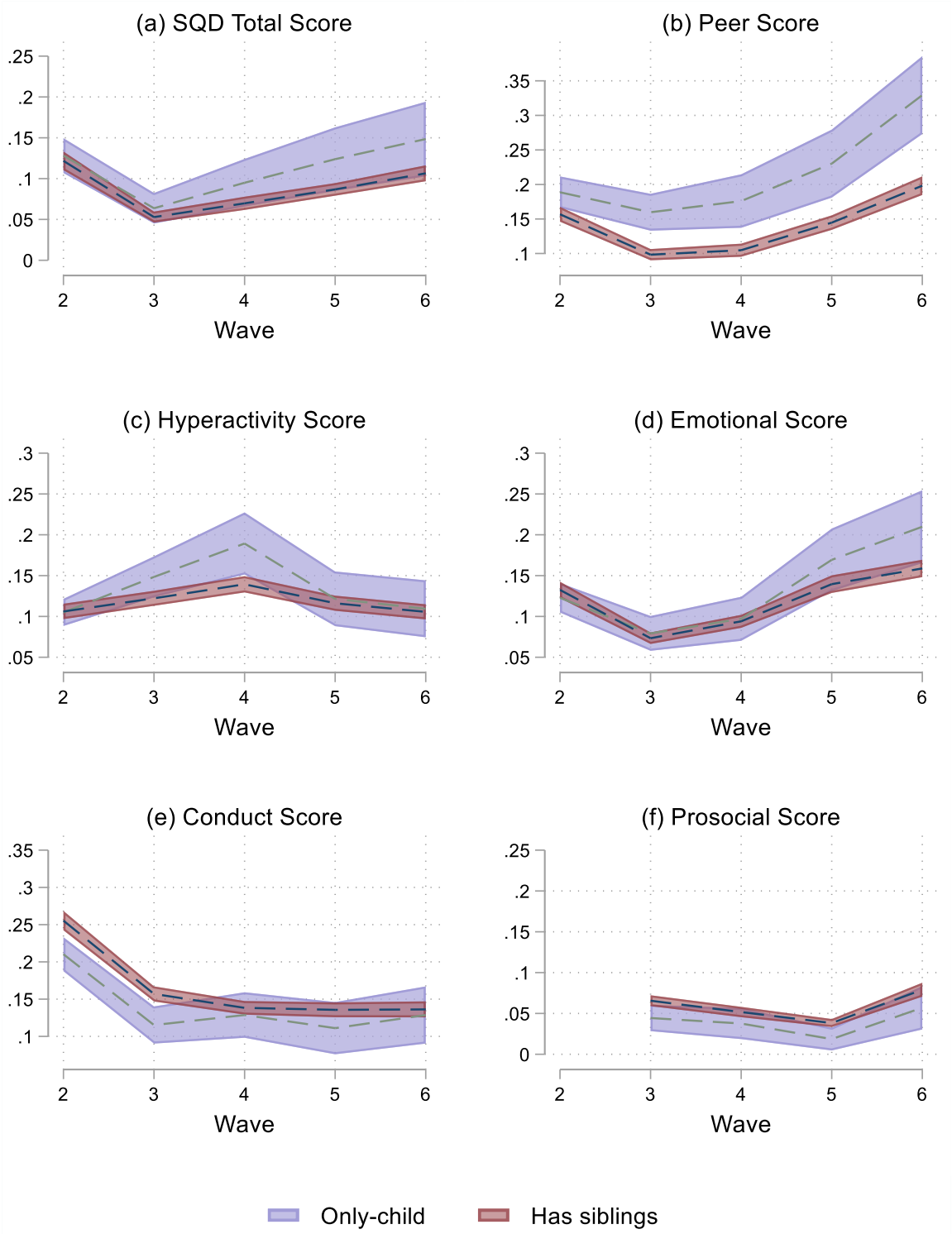
necessarily an “only-child effect”, but actually a disruption effect caused by parental union breakdown.

To test this in more detail, a similar analysis to the one presented in Figure 4.2 was done only for those with a consistent resident father (it excludes those who never had a resident father, had a father leave the household, or had a father leave then return to the household). The results presented in Figure 4.5 show that the scores are overall smaller for both groups, indicating an overall better adjustment for the children with a resident father, regardless of sibship size. However, differences still remain.

We notice that the peer score differences between only-children and children with siblings remain even when we consider only those with resident father. This indicates that difficulties with peer relationships cannot simply be explained by a union breakdown effect. On the other hand, we notice that the conduct score differences mostly disappear. However, this seems to be due to a reduction in the scores both for only-children and for children with siblings. This highlights the importance of having a resident father (which could be a proxy for a stable home life or lack of parental conflict) when considering this type of behaviour.

It is interesting, however, that those with siblings show greater conduct problems in the full sample, when they are more likely than only-children to have a resident father. We can hypothesise a few possible explanations for this. For one, it is possible that not having a resident father has a bigger effect on behaviour when there are multiple children to be taken care of, as the mother has to split her attention between a larger number of children without the (full) help of a partner.

Figure 4.5 Predicted probabilities (with 95% CIs) of having abnormal behaviours for only-children and children with siblings *for only those with resident father* across all waves



Notes: 1) The full regression table can be found in Appendix C. 2) The y-axis has the same range for all sub-graphs, but different values to facilitate visualisation. 3) The analysis for pro-social behaviour in wave 2 was not considered due this measure being inconsistent for children at that age.

Source: created by the author based on the MCS data

It is also possible that these groups represent different types of "non-resident father". For example, a non-resident father for an only-child could indicate an early separation – as seen in figure 4.1, the drop in resident fathers for only-children happens much earlier than for those with siblings, where the drop is also more gradual over the waves. This could mean the only-child is more used to not having a resident father compared to children with siblings that may suffer a disruption effect later in life. While not the focus of this chapter, further studies into this union breakdown/resident father effect could help us better understand differences in children's behaviour and well-being.

4.8. Discussion and conclusion

This chapter's main objective was to explore behaviour differences between only-children and children with siblings in the British context. The analysis looked at children between ages 3 and 14 from the Millennium Cohort Study (MCS), born in 2000.

The first hypothesis of this study expected only-children to present higher chance of having abnormal peer and prosocial behaviours than children with siblings across all age groups, following the stereotypes about only-children being solitary, lonely and selfish. The results partially confirmed this hypothesis when considering the results for peer behaviours, which are measured as being solitary, not being much liked by other children, getting on better with adults than other children, and being picked on or bullied. These results remain even when only-children are compared only with those with one sibling or those with two or more siblings.

In addition, only-children fared better than children with siblings when considering conduct scores, which measures temper tantrums, obedience, if they often fight with others, lie or steal. When comparing only-children with firstborns however, the conduct behaviour advantage of only-children disappears, indicating that conduct

problems may be more closely related to birth order than sibship size. Only-children also fared better at pro-social scores, measuring if they are considered of other's feelings, share their things with other children, and are helpful and kind.

For older children (14 years old), only-children also presented higher chance of emotional problems, such as having headaches, being often worried, unhappy, fearful, or nervous in new situations. This could be related to the idea that, due to the lack of siblings, only-children have the bear the parental expectations solely on themselves, which could lead to these children growing up more anxious.

When looking at the children's behaviours at different ages, the results showed the opposite of what was expected: the predicted probabilities for having abnormal behaviours was higher for older children than younger children, with the exception of conduct and hyperactivity scores. However, the behaviours were also consistent for all children, regardless of having siblings or not, and the analysis with pooled data for all waves showed no significant differences between only-children and children with siblings across waves.

Only-children also had a higher proportion of non-resident fathers, which has been shown to be linked to a higher chance of abnormal behaviours. The results also show that, even among only-children, those without a resident father show a higher chance of having abnormal behaviours. When only those with resident fathers are compared between only-children and children with siblings, the peer behaviour disadvantage for only-children remains, indicating that these abnormal behaviours cannot be fully explained simply by a disruption effect caused by parental union breakdown, for example.

The results of this chapter highlight the importance of the behaviour subscales when exploring behaviour differences. If we consider only the total SDQ score, no

significant differences can be seen between only-children and children with siblings, but more becomes clear when looking at the separate types of behaviour (peer, conduct etc.).

While overall both children with and without siblings fall within the expected curve of behaviours when considering the big picture, the results highlight important magnitude differences in the odds of presenting abnormal behaviour between only-children and children with siblings, when considering peer and conduct behaviours. Specifically for conduct behaviours, the only-child advantage over those with siblings is diminished by the fact that the only-child group is more likely to have a non-resident father. At the same time, the peer score disadvantage of only-children remains regardless of other controls, and indicates a substantial behaviour difference for only-children when compared to other sibship groups. This result lends strength to the stereotypes about only-children presenting more solitary behaviour.

Considering the limitations of the analysis, the chapter deals with small sample sizes, in addition to dealing with an already small, albeit growing, subgroup of the population. Therefore, while the differences observed are relevant and need to be discussed – for example, the only-children at age 11 presenting an almost 70% higher odds of presenting peer abnormal behaviour when compared with those with siblings – further studies with larger sample sizes, and across different populations, could help us form a better picture of these differences. Overall, the observed consistency in the higher odds of peer abnormal behaviour for only-children across the analysis points to a need of further exploration of the reasons why only-children are falling behind in this sense, and what measures could be done, either on a micro or macro scale, to improve this aspect of only-children's well-being.

In that regard, while the discussions presented in this chapter bring useful insights for understanding only-children in a general sense, the specific findings may be particular

to the UK. As discussed across this chapter, environmental factors are important when considering children's behaviours. For example, prevalence of union breakdown, average age at childbearing, how prevalent only-children are in a society, and the socioeconomic distribution of only-child families all can have an impact on their behaviour and well-being. As discussed by Goisis et al. (2023), only-child families in the UK tend to be socioeconomically advantaged. In societies where that is not the case, it is possible that the comparisons between only-children and children with siblings would yield different results. Therefore, it is important that more studies about only-children are conducted across different contexts to allow us to test if certain aspects of their behaviour stay consistent even when environmental factors vary.

Further studies could also benefit from following children into adulthood, to explore not only possible behaviour changes, but also how being an only-child has affects them in other aspects of their life. The small sample size of this study was a limitation to the analysis, however more studies like this are necessary to show the importance of investing in larger surveys that also cover children's behaviours. With larger sample studies, future research could also explore subnational or subgroup differences in behaviour between only-children, as previous research has shown how socioeconomic background is important for determining behaviour problems (Anderson, 2016).

In addition, cross country comparisons could also help determine if the patterns observed here are specific to the UK. As discussed in the Chinese literature, cultural differences can certainly affect how only-children are viewed by society, and treated by their family and peers, which can shape their behaviour. It is possible that in other contexts, where only-children are more or less prevalent – and more or less accepted – their behaviour will be different for the ones observed in this study. Additionally, very

little is known about only-children in developing countries. As their prevalence grows in these regions, it would be interesting to study their behaviour over the generations.

Overall, while the results of this study cannot confirm all of the stereotypes directed at only-children, they do highlight the disadvantages of only-children regarding their peer-relationship behaviours. From practical significance perspective, the analyses show that being an only-child can be considered a hindrance or an advantage depending on the sub-scale being analysed. While only-children may be more likely to present difficulties relating to their peers, as some stereotypes suggest, they are also more likely to be more obedient and better behaved. They are not much different than their peers relative to their sharing behaviour, which is usually also seen as a negative trait of only-children. As discussed in the literature review, negative behaviours can be seen across sibship sizes, but seem to be more strongly stigmatised when the subject is an only-child.

The continuing propagation of these stereotypes, regardless of them being true or not, can feed into social notions of ideal family types, as people may avoid having an only-child. And for those who do have an only-child, whether intended or due to unforeseen fertility constraints, these stereotypes can affect how the child is viewed by both their parents and their peers, which in turn can affect the child's behaviour and mental health. The continuing research and dissemination of studies about only-children can help change the public perception and reduce the pervasiveness of these negative stereotypes.

Conclusion

5.1. Findings and implications

The main goal of this thesis was to better contextualise only-child fertility from a sociological and demographic perspective. Over the course of three chapters, I have explored this topic from a global, as well as regional perspective. Chapter 2 provided a global overview in the trends of only-child fertility and how those relate to overall fertility trends. Chapter 3 followed up on some of the previous chapter's results, and explored fertility intentions and the realisation of those intentions in Europe for a first and second child. Finally, Chapter 4 tested the validity of negative behaviour stereotypes often attributed to the only-child.

The focus on only-children was motivated by the lack of research on this topic. Despite the global fertility decline, our knowledge about low parity outcomes is still lacking, especially when considering countries with limited fertility data. One of the contributions of this thesis was providing comparable trends in only-child fertility for countries across the world, especially countries in the global south.

As discussed in the introduction chapter, finding a definition of "only-children" that suits every context can be tricky, and each chapter of this thesis had slight variations in what it considered an only-child, due to data limitations and to better suit the context and goals of each study.

The trends created by the harmonisation of different datasets used for Chapter 2 allowed for a better understanding of the only-child fertility in different contexts. The results show similar country trends over the course of the demographic transition, but highlight the heterogeneity in childlessness and only-child fertility as countries reach low-fertility levels, indicating that cultural and socioeconomic factors become more relevant for understanding family size, as people are able to take more conscious control over their fertility.

As many countries today struggle with very low fertility rates and an aging population, the results of Chapter 2 highlight the importance of parity specific analysis when dealing with low-fertility outcomes. A high proportion of only-children in a population is very different from a high proportion of childlessness, even if total fertility rate is similar in both contexts. As also discussed in the Chapter 3, fertility outcomes can be influenced by both cultural as well as socioeconomic factors, and when thinking of policies to tackle decreasing fertility, it is necessary to first understand what has lead people to these parity outcomes.

Chapter 3 shows a disparity between fertility intentions and outcomes in low fertility contexts in Europe. Eastern Europe, as shown in both chapters 2 and 3, has a very low prevalence of childlessness. The low prevalence of childlessness in Central and Eastern Europe has separated the region from the rest of Europe for most of the 20th century. In Western Europe, on the other hand, childlessness and only-child fertility have much more similar prevalences.

This low prevalence of childlessness in Eastern Europe indicates that most of the region's fertility decline has been due to an increase in women finishing their reproductive period with just one child. In Chapter 3, when considering the factors affecting realisation rates of short-term fertility intentions, the results show the importance of people's perceived control over having children, which includes being in a union (and having what they consider to be a suitable partner), their financial situation (including work and housing conditions), their health, and availability of childcare and parental leave. The analysis in this chapter highlights the importance of socioeconomic security for fertility considerations. While social norms regarding how many children one is expected to have certainly have an impact in what people believe to be the ideal family size, the actual consolidation of those beliefs cannot happen if people do not feel prepared to raise a child.

Effective public policies for tackling falling fertility trends would need to take these factors into consideration. Childcare availability, as well as costs of living and of schools have a direct impact on people's perceived ability to raise children. Similarly, the growing incompatibility between a successful work and personal life can also affect childbearing decisions, as people may choose to pursue an education or their careers at the cost of delaying or forgoing marriage and childbearing. The socioeconomic aspect, however, is only one part of the puzzle.

Policies that want to tackle falling fertility rates might not affect all groups equally. As shown throughout this thesis, countries with similar fertility levels may present very different parity distributions. The driving mechanisms of low fertility in a country with a high proportion of childless people and low proportion of only-child parents may be different than in a country that presents the opposite. In contexts where low fertility is a consequence of cultural (e.g. ideal family size preferences) or gender norms (e.g. women have to shoulder most of the responsibilities of childcare), financial incentives for raising fertility will not be enough.

As discussed across all chapters of this thesis, only-children can be both a consequence of desired fertility or unrealised fertility intentions. While some women may indeed desire to have only one child, the long term fertility intentions for a second child are still fairly high. The results of Chapter 3 highlight some of the barriers people encounter when trying to progress to a higher parity, which certainly contribute to the increase in the prevalence of only-children.

At the same time, the role of cultural norms for family formation cannot be ignored, as they will influence people's fertility desires, as can be seen by the differences in long-term fertility intentions between Eastern and Western Europe. Even during periods of socioeconomic uncertainty (such as mid and late 20th century), most men and

women were still having at least one child in Eastern Europe. However, the region may be seeing a cultural change in that regard, as childlessness is increasing in the region for more recent cohorts (Sobotka 2017). If people now feel that being childless is socially acceptable, we may see a decrease in only-child prevalence in the region, unless acceptance of only-children also increases.

As discussed in Chapter 4, the persistency of negative stereotypes about only-children is one of the reasons why people do not explicitly intend to have a single child. Only-children are often considered solitary, selfish or overall problematic (Falbo 2020; Falbo and Polit 1986; Mancillas 2006), and this has been cited as the reason why parents decide to have a second child (Blake 1981; Falbo and Polit 1986; Laybourn 1990).

It is still unclear why these negative stereotypes have persisted for so long. It is possible that, in the past, when family sizes were much larger and only-children were much rarer, the only people who did not progress to a second child, were the ones with physiological or psychological limitations, which then led to behaviour problems for the children as well. Some authors have also argued that the families that have survived over time were the ones with a stronger pro-natalist sentiments, creating a prejudice against only-children (Blake 1981; Sobotka and Beaujouan 2014).

Chapter 4 explores behaviour differences between only-children and children with siblings in the United Kingdom and the results are only slightly supportive of the negative stereotypes. Only-children presented higher chance of abnormal peer behaviours, measured by their relationship to other children, which goes in line with the solitary stereotypes about only-children. At the same time, only-children fared better than children with siblings when considering conduct scores, which measures children's overall obedience/well-manners. There were no significant differences in emotional and hyperactivity measures between the two groups. However, this advantage disappears

when only children with resident father are considered, which may indicate that the negative effect of not having a resident father or a parental union breakdown is larger for children with siblings. This conduct difference is also not observed when only-children are compared with firstborns, while the peer disadvantage of only-children persists.

This chapter highlights the propagation of negative stereotypes about only-children, which seem to be mostly unfounded. When discussing only-children, only the negative aspects seem to be discussed and their achievements are usually ignored. It is possible that, as families become smaller, these negative stereotypes will begin to fade, or become less important in informing people's fertility decisions. If that is the case, we may see a decrease in two-child fertility, accompanied by an increase in only-children, for the people who do not want to, or feel like they cannot, take the economic burden of a second child.

When taken together, the three substantive chapters of this thesis help to paint a fuller picture of only-child fertility, and separate it from other parity outcomes. As fertility continues to fall across the world, an increase in only-children is expected. However, as seen for Europe, some level of heterogeneity is expected depending on social, cultural and economic factors, including norms about ideal family size, costs of raising children and different levels of acceptance for childlessness and only-children.

5.2. Limitations and future research

Over the next few decades, it will be interesting to explore countries' fertility trajectories as they reach low or very low fertility levels, as there is still much we do not know about only-children and only-child fertility that requires further research. One important aspect of research, discussed briefly in Chapter 2, is the impact of the increase in only-children in the intergenerational transmission of inequality. As only-children are more common among higher educated women, they can receive double advantages when

compared to children from larger families, as they do not have to compete with siblings for resources, and they receive higher (social/economic) capital investments than children from lower-educated parents (when considering education as a proxy for socioeconomic status). Future research could explore if this educational disparity by family size is maintained over time, and if they are enough to create a noticeable growing inequality between one-child and multiple-child families in countries with a considerable prevalence of only-children.

Considering other research expansions on the only-child, more demographic analysis could be done on the impact of the increase in only-children for family and household composition, as well as differences between only-children and children with siblings in their life-course trajectories. For example, do only-children differ from children with siblings in their timings of transition to adulthood? How does the increase in only-children affect the household and family compositions in regards to extended family availability? What would be the demographic impacts if these only-child fertility increased or decreased over the next few decades?

From a demographic perspective, an interesting follow-up study to what has been presented in this thesis – if the necessary data would be available – would be to quantify how much of the increasing prevalence of only-children in a certain population is due to unrealised fertility intentions and how much is due to changing preferences, by either making use of short and long-term fertility intention information, or retrospective fertility intentions. Both of these methods have their limitations (Joyce et al., 2002; Manski, 1990), but they could help us better measure the acceptance of only-children as a desired fertility outcome.

Additionally, most of the analysis in this thesis focused on female fertility. As it is the case with general male fertility, the role of men as fathers of only-children remains

severely underexplored due to the limitations on collecting reliable information on male fertility. As shown throughout the chapters, men and women can experience parenthood differently. Chapter 4, for example, briefly shows that only-children have a higher prevalence of non-resident fathers, when compared to children with siblings, which affects the way in which mothers and fathers interact with their child. Exploring gender differences in parent-child interactions could provide interesting results for understanding both the child's behaviour, as well as for male fertility overall.

Moreover, we also need more information on adult only-children. Especially in countries where the care for elderly parents is typically done by the children, how do only-children and their parents fare in comparison to their peers in larger families? This question has been tackled by a handful of studies (Chanfreau & Goisis, 2022b; Ogg & Renaut, 2006), but the authors also highlight the need for further data collection and research on this topic. Future research could explore the consequences of being an only-child across different life stages, from childhood, to adulthood and late life. From a demographic perspective, for example, it would be worthwhile to verify if being an only-child affects people's timings in life-stage transitions such as leaving their parent's households, getting married and having children. For elderly only-children, it would be interesting to explore if the lack of siblings has had impacts on their overall health and availability of a support network.

Further expanding on the research of Chapter 4, as more data from the Millennium Cohort Study and similar studies become available, the analysis of behaviour differences between only-children and children with siblings could be explored for those in their late teens and adult years. It would also be interesting to explore if these negative stereotypes propagated about only-children have an effect on the children's behaviours and well-being. While the analysis of Chapter 4 was based on the mother's assessment of their

child's behaviour, a behaviour analysis based on the child's responses could also help to illuminate any biases in the parent's views of their children.

To further our understanding of stereotypes on only-children, data from different countries could also be useful, especially outside of North America, Europe and China. Similarly, subnational analysis could reveal interesting differences between (ethnic, religious or socioeconomic) subgroups. Unfortunately, lack of data is still a great limitation on this topic. While only-child prevalence is growing, they are still a minority when compared to two-child families, and data availability and sample sizes are still a great limitations for more in-depth studies on only-children. Studies like the ones presented in this thesis also serve as examples for why only-children are an interesting topic of study, which could help the case for further surveys and data collection projects.

The studies presented here, while relevant in their own right, also present limitations that need to be discussed. The first limitation, which impacted all three substantive chapters, are small sample sizes. This constriction becomes even more apparent when separating the already small population of men and women with one child by other controls, such as gender and age. The small numbers lead to large confidence intervals, and increase the probability of type-II error in the hypothesis testing. Replication of the results in this thesis, as well as similar analysis for other countries and populations could help check for the robustness of the findings. Considering the available data, however, that is unfortunately a limitation that needs to be worked around when dealing with only-children.

The lack of data for the global south was also a limiting factor in the analyses, as previously mentioned. Unfortunately, a lot of the existing theories about fertility behaviours are based on the experience of developed countries, which could be very different in the contexts of Asia, Africa and Latin America. Hopefully, as only-children

become more common across the world, increasing sample sizes and data availability will follow to allow for better cross-country comparisons.

Future research would benefit from further data collection and exploration of alternative data sources. Registry data can be a good source of information, but for most countries it does not provide data beyond basic demographic counts. Cohort studies and fertility history surveys, similar to the ones used in this study allow the exploration of contextual information beyond demographic trends, but unfortunately these are limited to only a few countries and may suffer from small sample sizes. For a fuller picture of only-child fertility, a mix methods approach with quantitative and qualitative data could help uncover the drivers and limitations of one-child fertility.

Moreover, Chapter 2 is a descriptive and global perspective on only-child fertility. As such, I am not able to explain the observed patterns, nor am I able to explore the country trends in detail. In addition, some broad generalisations were needed to allow for the use of the varied data sources, including a simplification of educational categories and approximations for the calculations of the counterfactual scenario. The calculations may also be overestimating only-child fertility as it uses information from the mother's perspective and does not account for only-children. The inclusion of women aged 40-50 may also cause similar overestimation, as they may still have a second child before the end of their reproductive period.

Aside from the criticisms of using fertility intentions as a predictor of fertility outcomes, discussed in Chapter 3, the analysis still suffers from a few limitations. First, while the countries chosen for the analysis represent the cultural backgrounds and parity distributions relevant for the analysis, it could be argued that more countries are needed to form an accurate picture of Eastern and Western Europe. Data availability for the dependent and independent variables in the analysis were limiting factors in the inclusion

of more countries, but further research would be needed to more accurately compare the two regions. Specifically for Western Europe, the regressions could not produce significate results for understanding realisation of fertility intentions for a second child. In addition, by including both single and married individuals in the analysis, it was not possible to test for couple characteristics that may affect fertility outcomes. And while the questions on intentions and outcomes are done with a three-year period in mind, the analysis would benefit from following the respondent's further into the future, for a full fertility history analysis.

In Chapter 4, the way in which siblings are identified could have led to an overestimation of only-children in the dataset. In addition, the analysis is done in a cross-sectional way, which limits the comparisons between the age groups and does not allow for us to understand if behaviours change over the life course. This simpler methodology was chosen to help with the smaller sample size, but further studies following a life-course approach could be useful in exploring how children with and without siblings experience their life course transitions and how that may affect their well-being and behaviour.

This thesis, while definitely not a comprehensive look at only-child fertility, helps to paint a fuller picture about the topic, answering some questions and raising others. In addition to the contributions previously highlighted, the results and discussions presented here serve to illuminate us on the limitations of the current research and data on this growing demographic subgroup, which can hopefully be expanded in the future.

Appendix A

Table A1. Countries, cohorts and data sources included in the analysis

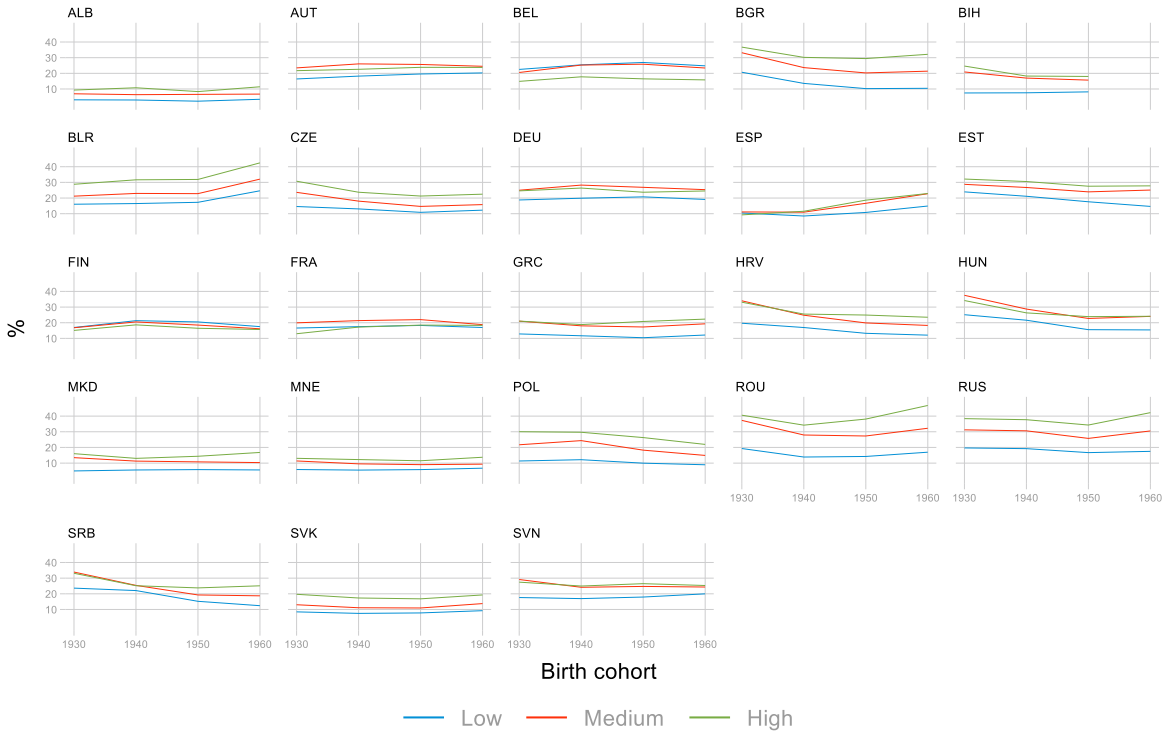
			Cohort						
	Country	Code	1920-29	1930-39	1940-49	1950-59	1960-69	1970-79	Source
1	Afghanistan	AF			x	x			DHS
2	Albania	AL		x	x	x	x	x	CFE
3	Angola	AO					x	x	DHS
4	Argentina	AR	x	x	x	x	x		Ipums
5	Armenia	AM			x	x	x	x	Ipums
6	Austria	AT	x	x	x	x	x		Ipums
7	Azerbaijan	AZ				x	x		DHS
8	Belarus	BY		x	x	x	x		CFE
9	Belgium	BE	x	x	x	x	x		CFE
10	Benin	BJ		x	x	x	x	x	Ipums
11	Bolivia	BO	x	x	x	x	x		Ipums
12	Bosnia and Herzegovina	BA	x	x	x	x			CFE
13	Botswana	BW	x	x	x	x	x	x	Ipums
14	Brazil	BR	x	x	x	x	x	x	Ipums
15	Bulgaria	BG	x	x	x	x	x		CFE
16	Burkina Faso	BF	x	x	x	x	x		Ipums
17	Burundi	BI		x	x		x	x	DHS
19	Cambodia	KH		x	x	x	x		Ipums
20	Cameroon	CM			x	x	x		Ipums
21	Canada	CA	x	x	x	x			Ipums
22	Central African Republic	CF			x	x			DHS
23	Chad	TD			x	x	x	x	DHS
24	Chile	CL	x	x	x	x	x		Ipums
25	China	CN	x	x	x	x	x		Ipums
26	Colombia	CO	x	x	x	x	x		Ipums
27	Comoros	KM			x	x	x	x	DHS
28	Congo	CG				x	x	x	DHS
29	Congo	CD				x	x	x	DHS
30	Costa Rica	CR	x	x	x	x	x	x	Ipums
18	Cote d'Ivoire	HR			x	x	x	x	DHS
31	Croatia	CZ	x	x	x	x	x	x	CFE
32	Czechia	CI	x	x	x	x	x		CFE
33	Denmark	DK				x	x	x	HFD
34	Dominican Republic	DO	x	x	x	x	x	x	Ipums
35	Ecuador	EC	x	x	x	x	x	x	Ipums
36	Egypt	EG		x	x	x	x	x	DHS
37	El Salvador	SV		x	x	x	x		Ipums
38	Estonia	EE	x	x	x	x	x	x	CFE
39	Eswatini	SZ				x	x		DHS
40	Ethiopia	ET	x	x	x	x	x		Ipums
41	Fiji	FJ	x	x	x	x	x		Ipums
42	Finland	FI		x	x	x	x	x	CFE
43	France	FR		x	x	x	x		CFE
44	Gabon	GA				x	x	x	DHS
45	Gambia	GM					x	x	DHS
46	Germany	DE		x	x	x	x	x	CFE

47	Ghana	GH			x	x	x	x	Ipums
48	Greece	GR		x	x	x	x	x	Ipums
49	Guinea	GN		x	x	x			Ipums
50	Haiti	HT	x	x	x	x	x		Ipums
51	Honduras	HN	x	x	x	x	x		Ipums
52	Hungary	HU	x	x	x	x	x	x	Ipums
53	India	IN			x	x	x	x	DHS
54	Indonesia	ID	x	x	x	x	x	x	Ipums
55	Iran	IR			x	x	x	x	Ipums
56	Iraq	IQ		x	x	x			Ipums
57	Israel	IL	x	x	x	x			Ipums
58	Jamaica	JM	x	x	x	x	x		Ipums
59	Japan	JP				x	x	x	HFD
60	Jordan	JO			x	x	x	x	DHS
61	Kazakhstan	KZ			x	x			DHS
62	Kenya	KE	x	x	x	x	x		Ipums
63	Kyrgyzstan	KG			x	x	x		Ipums
64	Lesotho	LS		x	x	x	x		Ipums
65	Liberia	LR	x	x		x	x		Ipums
66	Lithuania	LT				x	x	x	HFD
67	Malawi	MW	x	x	x	x	x		Ipums
68	Malaysia	MY	x	x	x				Ipums
69	Maldives	MV				x	x	x	DHS
70	Mali	ML	x	x	x	x	x		Ipums
71	Mexico	MX	x	x	x	x	x	x	Ipums
72	Mongolia	MN		x	x				Ipums
73	Montenegro	ME	x	x	x	x	x	x	CFE
74	Morocco	MA		x	x	x	x		Ipums
75	Mozambique	MZ			x	x	x		Ipums
76	Myanmar	MM					x	x	DHS
77	Namibia	NA			x	x	x	x	DHS
78	Netherlands	NL		x	x	x	x	x	HFD
79	Nicaragua	NI	x	x	x	x	x		Ipums
80	Nigeria	NG			x	x	x	x	DHS
81	North Macedonia	MK	x	x	x	x	x		CFE
82	Norway	NO				x	x	x	HFD
83	Pakistan	PK			x	x	x	x	DHS
84	Panama	PA	x	x	x	x	x	x	Ipums
85	Papua New Guinea	PG			x	x	x		Ipums
86	Paraguay	PY	x	x	x	x	x		Ipums
87	Peru	PE		x	x	x	x		Ipums
88	Philippines	PH					x	x	Ipums
89	Poland	PL	x	x	x	x	x		CFE
90	Portugal	PT			x	x	x	x	HFD
91	Puerto Rico	PR	x	x	x	x			Ipums
92	Romania	RO	x	x	x	x	x	x	Ipums
93	Russian Federation	RU		x	x	x	x	x	CFE
94	Rwanda	RW			x	x	x	x	Ipums
95	Sao Tome and Principe	ST					x		DHS
96	Senegal	SN			x	x	x		Ipums
97	Serbia	RS	x	x	x	x	x		CFE
98	Sierra Leone	SL			x	x	x		Ipums
99	Slovakia	SK	x	x	x	x	x	x	CFE
100	Slovenia	SI	x	x	x	x	x	x	CFE
101	South Africa	ZA		x	x	x	x	x	Ipums

102	South Sudan	SS				x	x		Ipums
103	Spain	ES		x	x	x	x	x	CFE
104	Sri Lanka	LK		x	x				DHS
105	Sudan	SD				x	x		Ipums
106	Sweden	SE				x	x	x	HFD
107	Switzerland	CH			x	x	x		Ipums
108	Taiwan	TW					x	x	HFD
109	Tajikistan	TJ					x	x	DHS
110	Tanzania	TZ			x	x	x	x	Ipums
111	Thailand	TH	x	x	x	x	x		Ipums
112	Timor-Leste	TL					x	x	DHS
113	Togo	TG			x	x	x	x	DHS
114	Trinidad and Tobago	TT	x	x	x	x	x	x	Ipums
115	Tunisia	TN		x	x				DHS
116	Turkey	TR	x	x	x	x	x		Ipums
117	Uganda	UG		x	x	x	x		Ipums
118	Ukraine	UA				x	x		DHS
119	United States of America	US	x	x	x	x			Ipums
120	Uruguay	UY	x	x	x	x	x	x	Ipums
121	Uzbekistan	UZ			x	x			DHS
122	Venezuela	VE	x	x	x	x	x		Ipums
123	Viet Nam	VN			x	x	x		Ipums
124	Zambia	ZM		x	x	x	x	x	Ipums
125	Zimbabwe	ZW		x	x	x	x	x	DHS
	TOTAL		50	76	102	112	110	61	

Source: created by the author

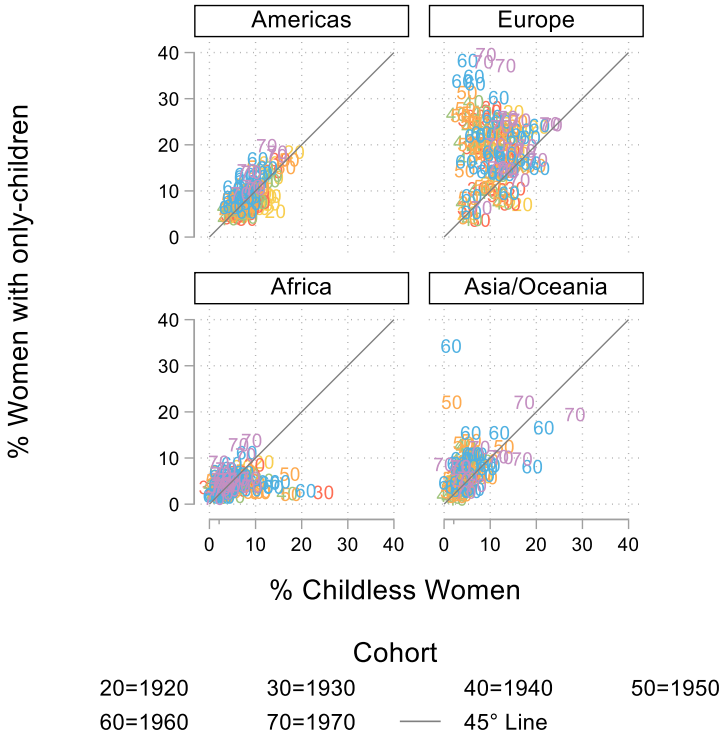
Figure A1. Proportion of women with only-children for selected European countries among women with high, medium and low education, by birth cohort of the mother



Note: Low is less than secondary education, medium is primary education; high is secondary education or higher. These trends show that generally, medium and high education follow very close trends, although there are outliers (Romania, ROU; Bulgaria, BGR).

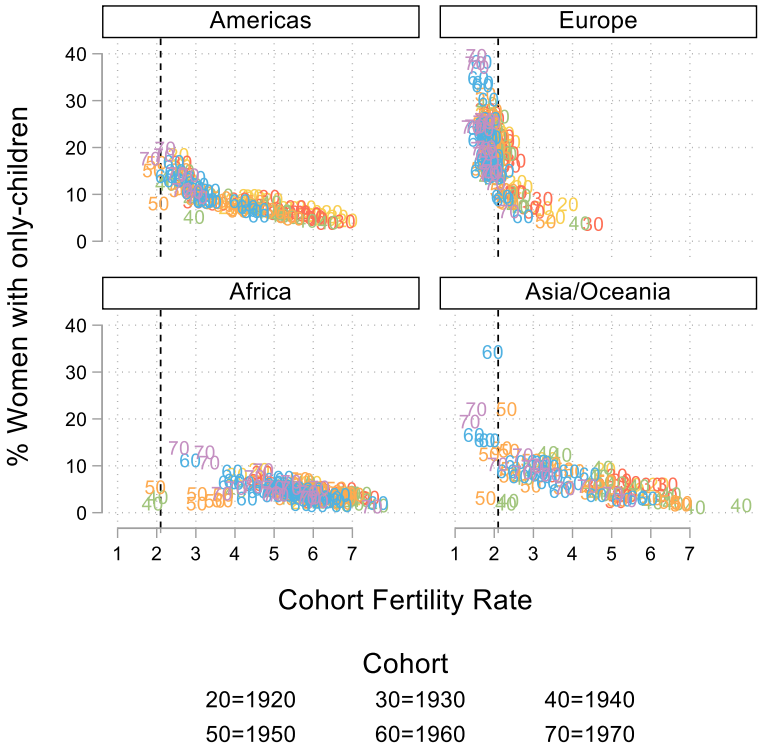
Source: data from IPUMS-I, CFE, and DHS.

Figure A2. Trends in proportion of women with only-children and childless women by region and birth cohort



Source: data from IPUMS-I, CFE, and DHS.

Figure A3. Proportion of women with only-children vs Cohort Fertility Rate by region and birth cohort



Source: data from IPUMS-I, CFE, and DHS.

Table A2. Correlation coefficient for above and below a certain fertility level for each birth cohort of the mother and number of observations (in parentheses)

Birth Cohort	r≥3	r<3	r≥2.5	r<2.5	r≥1.9	r<1.9
1920	-.69 (35)	-.89 (15)	-.80 (40)	-.68 (10)	-.86 (48)	-1.0 (2)
1930	-.67 (52)	-.82 (24)	-.77 (59)	-.65 (17)	-.83 (72)	-.93 (4)
1940	-.81 (65)	-.60 (37)	-.81 (74)	-.52 (28)	-.76 (93)	-.46 (9)
1950	-.57 (66)	-.52 (46)	-.64 (71)	-.47 (41)	-.74 (98)	-.05 (14)
1960	-.84 (64)	-.64 (46)	-.84 (72)	-.55 (38)	-.80 (91)	-.16 (19)
1970	-.76 (28)	-.70 (33)	-.84 (36)	-.65 (25)	-.80 (43)	-.53 (18)

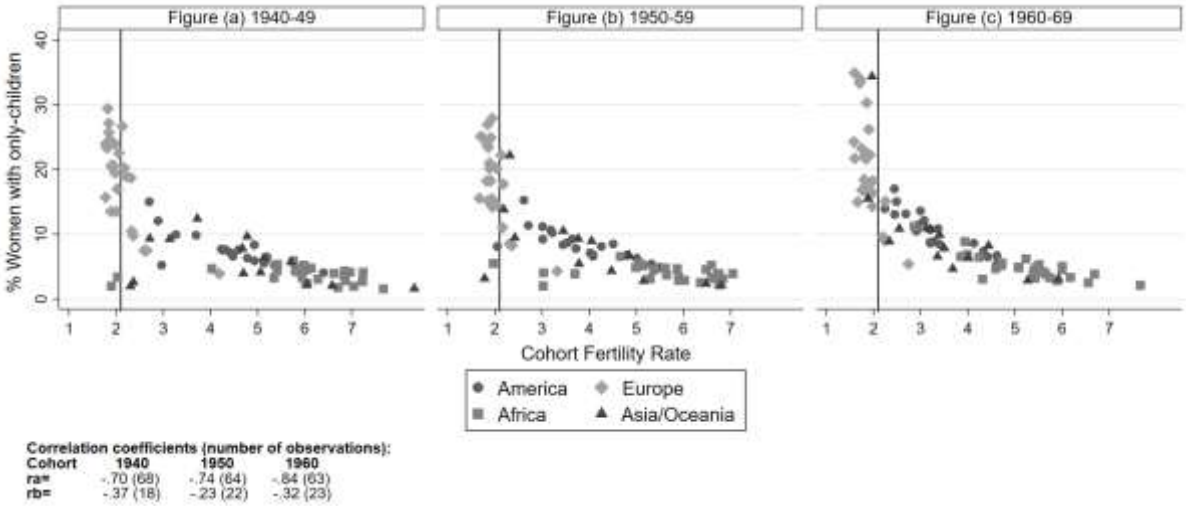
Source: data from IPUMS-I, CFE, HFD and DHS.

Table A3. Proportion of women with only-children vs Cohort Fertility Rate and correlation coefficient for above (ra) and below (rb) replacement fertility for each birth cohort of the mother using only countries that have data for the 1970–79 birth cohort (number in parenthesis)

Birth Cohort	ra	rb
1920	-0.88 (15)	- (02)
1930	-0.79 (23)	- (07)
1940	-0.80 (35)	-0.84 (10)
1950	-0.79 (35)	-0.49 (18)
1960	-0.83 (42)	-0.37 (19)
1970	-0.81 (39)	-0.63 (22)

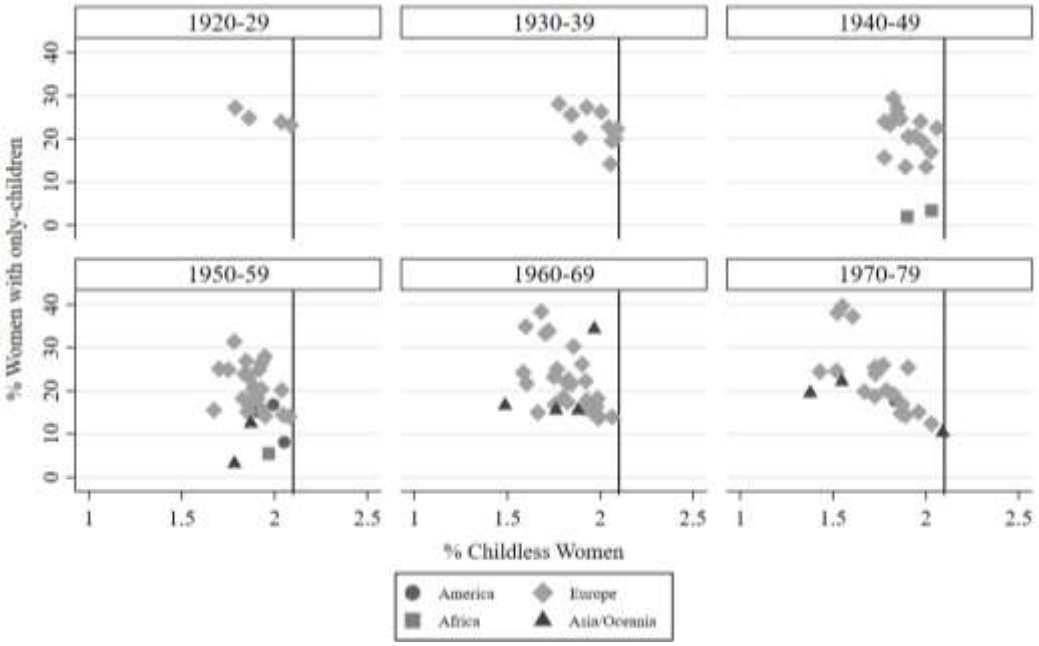
Source: data from IPUMS-I, CFE, HFD and DHS.

Figure A4. Proportion of women with only-children vs Cohort Fertility Rate and correlation coefficient for above (ra) and bellow (rb) replacement fertility for each birth cohort of the mother using only countries that have data for all three data points, 1940-49 to 1960-69



Source: data from IPUMS-I, CFE, HFD and DHS.

Figure A5. Proportion of women with only-children vs Cohort Fertility Rate for each birth cohort of the mother for countries with below replacement fertility



Source: data from IPUMS-I, CFE, HFD and DHS.

Appendix B

Table B1. Probit model with sample selection for the realisation of intentions (outcome equation) and fertility intentions in the next 3 years (selection equation), for *Western Europe*, for a first and second child *for those aged 35-44 years old*

	Western Europe			
	First child (1)		Second Child (2)	
Realisation of fertility intention				
Age	- 0.433	(1.401)	- 2.956	(1.740)
Age squared	0.006	(0.018)	0.037	(0.022)
Partnership status (ref.: married)				
Cohabiting	0.276	(0.377)	- 0.086	(0.320)
Out of Union	- 0.465	(0.300)	- 0.369	(0.515)
Education (ref.: low/medium)				
High	0.228	(0.260)	- 0.017	(0.335)
Sibship size	0.054	(0.056)	- 0.057	(0.043)
Gender (ref. male)	- 0.068	(0.289)	- 0.559	(0.333)
Subjective Norms	0.306*	(0.143)	0.232	(0.192)
Perceived control	0.350	(0.213)	0.345	(0.261)
N	141		104	
Fertility intention				
Age	- 0.717	(0.890)	- -0.927	(0.891)
Age squared	0.008	(0.011)	0.011	(0.011)
Partnership status (ref.: married)				
Cohabiting	- 0.699*	(0.273)	0.241	(0.189)
Out of Union	- 0.545*	(0.220)	0.042	(0.217)
Education (ref.: low)				
High	0.084	(0.174)	0.115	(0.191)
Sibship size	- 0.039	(0.044)	0.026	(0.041)
Sex (ref. male)	- 0.332*	(0.166)	- 0.104	(0.163)
Subjective Norms	0.250***	(0.076)	0.276***	(0.080)
Perceived control	1.041***	(0.231)	0.947***	(0.283)
Benefits	- 0.951***	(0.189)	- 0.863***	(0.184)
Costs	- 0.201	(0.127)	- 0.220	(0.127)
N	348		426	
Rho	0.0134		-0.268	

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table B2. Probit model with sample selection for the realisation of intentions (outcome equation) and fertility intentions in the next 3 years (selection equation), for *Eastern Europe*, for a first and second child *for those aged 35-44 years old*

	Eastern Europe			
	First child (1)		Second Child (2)	
Realisation of fertility intention				
Age	18.78	(29.54)	- 0.296	(2.731)
Age squared	- 0.267	(0.409)	0.004	(0.035)
Partnership status (ref.: married)				
Cohabiting	- 1.206	(1.089)	0.827	(0.804)
Out of Union	- 1.189	(0.640)	0.456	(0.591)
Education (ref.: low/medium)				
High	- 0.675	(0.964)	0.473	(0.427)
Sibship size	0.0977	(0.195)	0.189	(0.266)
Gender (ref. male)	- 0.203	(0.776)	- 1.007	(0.560)
Subjective Norms	- 0.470	(0.333)	- 0.005	(0.254)
Perceived control	0.593	(0.424)	0.478	(0.296)
N	79		61	
Fertility intention				
Age	0.0282	(1.310)	0.121	(1.098)
Age squared	- 0.0023	(0.017)	- 0.003	(0.014)
Partnership status (ref.: married)				
Cohabiting	- 1.012	(0.636)	0.440	(0.415)
Out of Union	- 1.265**	(0.452)	- 0.130	(0.250)
Education (ref.: low/medium)				
High	0.304	(0.262)	0.745***	(0.198)
Sibship size	0.077	(0.095)	- 0.023	(0.082)
Sex (ref. male)	- 0.223	(0.256)	- 0.698***	(0.204)
Subjective Norms	0.126	(0.123)	0.427***	(0.094)
Perceived control	0.830**	(0.271)	0.649**	(0.211)
Benefits	- 0.430*	(0.204)	- 0.565**	(0.177)
Costs	- 0.071	(0.202)	- 0.092	(0.134)
N	158		634	
Rho	2.406		0.264	

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Appendix C

Table C1. Odds Ratio of having abnormal behaviour (*SDQ Total Score*) for only-children, compared to children with siblings, by wave

	wave 2	wave 3	wave 4	wave 5	wave 6
Sibship: has siblings (ref.) vs only-child	0.849**	1.014	0.996	1.146	1.096
	(0.0635)	(0.0918)	(0.111)	(0.126)	(0.136)
Mother's religion (ref.: non-religious)					
Christian	0.742***	0.808**	0.774***	0.843**	0.860**
	(0.0475)	(0.0709)	(0.0648)	(0.0660)	(0.0641)
Other	1.751***	1.777***	1.387**	0.949	0.997
	(0.207)	(0.232)	(0.190)	(0.128)	(0.137)
Mother is employed (ref.) vs not employed	1.647***	1.685***	1.650***	2.091***	2.160***
	(0.118)	(0.131)	(0.127)	(0.140)	(0.153)
Mother's age at birth	0.942***	0.960***	0.950***	0.968***	0.961***
	(0.00619)	(0.00785)	(0.00687)	(0.00607)	(0.00588)
Father not-resident father (ref.) vs resident	0.584***	0.447***	0.519***	0.498***	0.526***
	(0.0456)	(0.0415)	(0.0383)	(0.0380)	(0.0402)
Gender male (ref.) vs female	0.803***	0.574***	0.665***	0.669***	0.842**
	(0.0515)	(0.0440)	(0.0509)	(0.0469)	(0.0587)
Total Observations	**9,595**	**11,000**	**10,403**	**10,765**	**9,372**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: created by the author based on the MCS data

Table C2. Odds Ratio of having abnormal *Peer* behaviour for only-children, compared to children with siblings, by wave

	wave 2	wave 3	wave 4	wave 5	wave 6
Sibship: has siblings (ref.) vs only-child	1.178**	1.436***	1.488***	1.682***	1.536***
	(0.0843)	(0.121)	(0.151)	(0.166)	(0.152)
Mother's religion (ref.: non-religious)					
Christian	0.801***	0.866*	0.796***	0.814***	0.845***
	(0.0509)	(0.0672)	(0.0545)	(0.0521)	(0.0534)
Other	2.120***	1.775***	1.951***	1.195*	1.125
	(0.258)	(0.265)	(0.240)	(0.126)	(0.121)
Mother is employed (ref.) vs not employed	1.497***	1.537***	1.598***	1.806***	1.856***
	(0.0986)	(0.101)	(0.117)	(0.118)	(0.128)
Mother's age at birth	0.974***	0.977***	0.967***	0.978***	0.976***
	(0.00592)	(0.00611)	(0.00663)	(0.00508)	(0.00564)
Father not-resident father (ref.) vs resident	0.799***	0.638***	0.610***	0.730***	0.646***
	(0.0654)	(0.0526)	(0.0485)	(0.0464)	(0.0430)
Gender male (ref.) vs female	0.765***	0.821***	0.765***	0.813***	0.866**
	(0.0439)	(0.0585)	(0.0494)	(0.0490)	(0.0556)
Total Observations	**9,595**	**11,000**	**10,403**	**10,765**	**9,372**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: created by the author based on the MCS data

Table C3. Odds Ratio of having abnormal *Hyperactivity* behaviour for only-children, compared to children with siblings, by wave

	wave 2	wave 3	wave 4	wave 5	wave 6
Sibship: has siblings (ref.) vs only-child	0.818**	1.014	1.203**	0.942	0.980
	(0.0657)	(0.0867)	(0.102)	(0.105)	(0.137)
Mother's religion (ref.: non-religious)					
Christian	0.803***	0.758***	0.771***	0.824***	0.788***
	(0.0603)	(0.0544)	(0.0504)	(0.0586)	(0.0585)
Other	1.460***	1.330**	1.055	0.887	0.711**
	(0.172)	(0.156)	(0.135)	(0.108)	(0.103)
Mother is employed (ref.) vs not employed	1.343***	1.223***	1.423***	1.537***	1.784***
	(0.113)	(0.0760)	(0.0915)	(0.100)	(0.145)
Mother's age at birth	0.954***	0.950***	0.960***	0.975***	0.962***
	(0.00697)	(0.00606)	(0.00554)	(0.00559)	(0.00694)
Father not-resident father (ref.) vs resident	0.560***	0.602***	0.724***	0.506***	0.570***
	(0.0497)	(0.0459)	(0.0479)	(0.0379)	(0.0453)
Gender male (ref.) vs female	0.586***	0.562***	0.515***	0.484***	0.448***
	(0.0430)	(0.0380)	(0.0326)	(0.0327)	(0.0339)
Total Observations	**9,595**	**11,000**	**10,403**	**10,765**	**9,372**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: created by the author based on the MCS data

Table C4. Odds Ratio of having abnormal *Emotional* behaviour for only-children, compared to children with siblings, by wave

	wave 2	wave 3	wave 4	wave 5	wave 6
Sibship: has siblings (ref.) vs only-child	0.791***	1.017	0.957	1.060	1.247**
	(0.0696)	(0.122)	(0.117)	(0.0920)	(0.128)
Mother's religion (ref.: non-religious)					
Christian	0.736***	0.894	0.945	0.887*	0.861**
	(0.0516)	(0.0750)	(0.0698)	(0.0574)	(0.0571)
Other	1.724***	2.011***	1.284**	0.949	0.985
	(0.212)	(0.267)	(0.159)	(0.115)	(0.105)
Mother is employed (ref.) vs not employed	1.355***	1.648***	1.600***	1.623***	1.736***
	(0.0955)	(0.131)	(0.126)	(0.105)	(0.122)
Mother's age at birth	0.975***	0.974***	0.967***	0.997	0.991
	(0.00677)	(0.00744)	(0.00680)	(0.00606)	(0.00553)
Father not-resident father (ref.) vs resident	0.716***	0.654***	0.661***	0.595***	0.604***
	(0.0663)	(0.0605)	(0.0543)	(0.0419)	(0.0416)
Gender male (ref.) vs female	1.037	1.064	1.064	1.177**	1.749***
	(0.0686)	(0.0810)	(0.0677)	(0.0777)	(0.112)
Total Observations	**9,595**	**11,000**	**10,403**	**10,765**	**9,372**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: created by the author based on the MCS data

Table C5. Odds Ratio of having abnormal *Conduct* behaviour for only-children, compared to children with siblings, by wave

	wave 2	wave 3	wave 4	wave 5	wave 6
Sibship: has siblings (ref.) vs only-child	0.699***	0.643***	0.720***	0.696***	0.739**
	(0.0470)	(0.0515)	(0.0718)	(0.0821)	(0.102)
Mother's religion (ref.: non-religious)					
Christian	0.768***	0.874**	0.792***	0.917	0.872*
	(0.0468)	(0.0542)	(0.0516)	(0.0577)	(0.0640)
Other	1.077	1.001	1.001	0.922	0.959
	(0.112)	(0.126)	(0.119)	(0.0922)	(0.111)
Mother is employed (ref.) vs not employed	1.279***	1.246***	1.521***	1.748***	1.590***
	(0.0745)	(0.0765)	(0.103)	(0.116)	(0.101)
Mother's age at birth	0.941***	0.963***	0.956***	0.962***	0.959***
	(0.00480)	(0.00559)	(0.00545)	(0.00487)	(0.00606)
Father not-resident father (ref.) vs resident	0.670***	0.529***	0.569***	0.526***	0.576***
	(0.0463)	(0.0385)	(0.0374)	(0.0356)	(0.0390)
Gender male (ref.) vs female	0.846***	0.672***	0.643***	0.710***	0.841***
	(0.0458)	(0.0356)	(0.0406)	(0.0372)	(0.0497)
Total Observations	**9,595**	**11,000**	**10,403**	**10,765**	**9,372**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: created by the author based on the MCS data

Table C6. Odds Ratio of having abnormal *Pro-Social* behaviour for only-children, compared to children with siblings, by wave

	wave 2	wave 3	wave 4	wave 5	wave 6
Sibship: has siblings (ref.) vs only-child	0.754***	0.715**	0.836	0.627**	0.819
	(0.0481)	(0.100)	(0.152)	(0.145)	(0.147)
Mother's religion (ref.: non-religious)					
Christian	0.785***	0.786**	0.967	0.873	0.796**
	(0.0415)	(0.0798)	(0.115)	(0.0931)	(0.0741)
Other	0.811*	0.875	1.411	0.860	0.782
	(0.0897)	(0.146)	(0.329)	(0.213)	(0.125)
Mother is employed (ref.) vs not employed	1.142**	1.333***	1.400***	1.738***	1.431***
	(0.0613)	(0.115)	(0.159)	(0.210)	(0.140)
Mother's age at birth	1.013***	1.013	1.011	0.982*	0.976***
	(0.00509)	(0.00933)	(0.0103)	(0.0102)	(0.00782)
Father not-resident father (ref.) vs resident	0.926	0.796**	0.839	0.730***	0.804**
	(0.0679)	(0.0855)	(0.103)	(0.0860)	(0.0754)
Gender male (ref.) vs female	0.679***	0.414***	0.304***	0.376***	0.502***
	(0.0364)	(0.0425)	(0.0320)	(0.0419)	(0.0396)
Total Observations	**9,595**	**11,000**	**10,403**	**10,765**	**9,372**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: created by the author based on the MCS data

Table C7. Odds Ratio of having abnormal behaviours for only-children, compared to children with siblings, pooled data with waves 2-6, by behaviour type

	SDQ	Peer	Hyper.	Emot.	Cond.	Pros.
Sibship: has siblings (ref.) vs only-child	0.878*	1.159**	0.837**	0.821***	0.701***	0.657***
	(0.0626)	(0.0731)	(0.0599)	(0.0582)	(0.0407)	(0.0878)
Mother's religion (ref.: non-religious)						
Christian	0.799***	0.817***	0.794***	0.853***	0.841***	0.851***
	(0.0371)	(0.0299)	(0.0334)	(0.0314)	(0.0296)	(0.0501)
Other	1.295***	1.546***	1.040	1.344***	0.984	1.011
	(0.0917)	(0.100)	(0.0757)	(0.0817)	(0.0592)	(0.107)
Mother is employed (ref.) vs not employed	1.825***	1.684***	1.428***	1.600***	1.410***	1.463***
	(0.0738)	(0.0593)	(0.0556)	(0.0541)	(0.0472)	(0.0812)
Mother's age at birth	0.956***	0.975***	0.960***	0.983***	0.956***	0.992*
	(0.00409)	(0.00332)	(0.00358)	(0.00349)	(0.00294)	(0.00486)
Father not-resident father (ref.) vs resident	0.516***	0.681***	0.592***	0.655***	0.571***	0.772***
	(0.0253)	(0.0273)	(0.0258)	(0.0279)	(0.0217)	(0.0464)
Gender male (ref.) vs female	0.717***	0.800***	0.504***	1.178***	0.750***	0.419***
	(0.0303)	(0.0305)	(0.0193)	(0.0443)	(0.0224)	(0.0215)
Wave (ref.: wave 2)						
Wave 3	0.414***	0.584***	1.107**	0.519***	0.538***	-
	(0.0235)	(0.0257)	(0.0485)	(0.0240)	(0.0195)	
Wave 4	0.573***	0.681***	1.264***	0.725***	0.467***	0.827***
	(0.0294)	(0.0298)	(0.0558)	(0.0356)	(0.0169)	(0.0533)
Wave 5	0.691***	0.890***	1.092*	1.105**	0.453***	0.665***
	(0.0356)	(0.0390)	(0.0538)	(0.0499)	(0.0168)	(0.0434)
Wave 6	0.836***	1.396***	0.948	1.305***	0.451***	1.396***
	(0.0439)	(0.0599)	(0.0504)	(0.0636)	(0.0208)	(0.0902)
Sibship x Wave						
Wave 3	1.196*	1.282***	1.251**	1.241*	0.983	-
	(0.130)	(0.115)	(0.121)	(0.140)	(0.0808)	
Wave 4	1.165	1.323***	1.287**	1.204	1.022	1.186
	(0.145)	(0.138)	(0.144)	(0.137)	(0.0960)	(0.195)
Wave 5	1.293**	1.408***	1.122	1.303**	0.925	0.856
	(0.168)	(0.141)	(0.140)	(0.141)	(0.103)	(0.202)
Wave 6	1.227	1.347***	1.157	1.537***	1.069	1.172
	(0.164)	(0.150)	(0.162)	(0.191)	(0.146)	(0.234)
Total Observations	**51,179**					**47,349**

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Note: reference wave for pro-social model is wave 3.

Source: created by the author based on the MCS data

Table C8. Peer abnormal behaviour: marginal effects of sibship size and differences in the effects of sibship size across waves

	Pr(Peer Prob.)			
	Has Siblings	**Only-Child**	**First difference**	**Second dif. significance**
Wave 2	0.188***	0.211***	-0.023**	4, 5, 6
Wave 3	0.12***	0.167***	-0.047***	
Wave 4	0.137***	0.193***	-0.056***	2
Wave 5	0.17***	0.247***	-0.077***	2
Wave 6	0.236***	0.322***	-0.086***	2

*** p<0.01, ** p<0.05, * p<0.1

Note: the last column indicates which wave has significant differences with the wave in question

Source: created by the author based on the MCS data

Table C9. Conduct behaviour problems: marginal effects of sibship size and differences in the effects of sibship size across waves

	Pr(Conduct)			
	Has Siblings	**Only-Child**	**First dif.**	**Second dif. significant**
Wave 2	0.315***	0.247***	0.068***	
Wave 3	0.205***	0.153***	0.052***	
Wave 4	0.185***	0.142***	0.044***	
Wave 5	0.183***	0.129***	0.054***	
Wave 6	0.18***	0.143***	0.038**	

*** p<0.01, ** p<0.05, * p<0.1

Note: the last column indicates which wave has significant differences with the reference wave

Source: created by the author based on the MCS data

Table C10. Odds Ratio of having abnormal behaviour for only-children, compared to children with siblings, by wave and behaviour problem*, no controls model*

	wave 2	wave 3	wave 4	wave 5	wave 6
SDQ total score	1.039	1.309***	1.227**	1.139	1.098
	(0.0708)	(0.117)	(0.122)	(0.120)	(0.123)
Peer score	1.225***	1.582***	1.656***	1.589***	1.512***
	(0.0819)	(0.129)	(0.146)	(0.155)	(0.142)
Hyperactivity score	1.013	1.277***	1.345***	1.003	0.999
	(0.0756)	(0.0976)	(0.103)	(0.106)	(0.131)
Emotional score	0.864*	1.115	1.053	1.085	1.291**
	(0.0691)	(0.130)	(0.114)	(0.0929)	(0.130)
Conduct score	0.878**	0.829**	0.882	0.723***	0.770*
	(0.0518)	(0.0630)	(0.0801)	(0.0787)	(0.103)
Pro-social score	0.745***	0.727**	0.836	0.609**	0.814
	(0.0443)	(0.0976)	(0.141)	(0.138)	(0.144)
Total Observations	**9,595**	**11,000**	**10,403**	**10,765**	**9,372**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: created by the author based on the MCS data

Table C11. Odds Ratio of having abnormal behaviour *for children with two or more siblings, compared to children with 1 sibling*, by wave and behaviour problem, abridged table (omitted controls)

	wave 2	wave 3	wave 4	wave 5	wave 6
SDQ total score	1.501***	1.484***	1.270***	1.090	1.273***
	(0.118)	(0.149)	(0.108)	(0.0744)	(0.109)
Peer score	1.281***	1.312***	1.241**	1.004	1.117
	(0.0930)	(0.105)	(0.107)	(0.0670)	(0.0804)
Hyperactivity score	1.177*	1.167*	1.030	1.047	1.158*
	(0.111)	(0.0933)	(0.0708)	(0.0747)	(0.0973)
Emotional score	1.214**	1.339***	1.152*	1.090	1.132
	(0.105)	(0.131)	(0.0941)	(0.0702)	(0.0933)
Conduct score	1.278***	1.369***	1.194***	1.202***	1.279***
	(0.0791)	(0.0873)	(0.0761)	(0.0710)	(0.0982)
Pro-social score	1.066	1.344***	1.330**	1.338**	1.197**
	(0.0712)	(0.136)	(0.150)	(0.175)	(0.108)
Total Observations	**7,220**	**9,304**	**9,169**	**9,770**	**8,612**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: created by the author based on the MCS data

Table C12. Odds Ratio of having abnormal behaviour for only-children, compared to children with siblings*, including only those who participated in all waves of the survey*, by wave and behaviour problem, abridged table (omitted controls)

	wave 2	wave 3	wave 4	wave 5	wave 6
SDQ total score	0.896	0.778	1.167	1.533*	1.140
	(0.128)	(0.177)	(0.271)	(0.341)	(0.262)
Peer score	1.142	1.425*	1.791***	1.635***	1.811***
	(0.149)	(0.279)	(0.348)	(0.303)	(0.317)
Hyperactivity score	0.931	0.856	1.370*	0.848	0.773
	(0.145)	(0.150)	(0.235)	(0.195)	(0.208)
Emotional score	0.863	0.936	0.965	0.969	1.172
	(0.129)	(0.192)	(0.227)	(0.191)	(0.190)
Conduct score	0.695***	0.626***	0.557***	0.859	0.778
	(0.0723)	(0.109)	(0.116)	(0.196)	(0.180)
Pro-social score	0.842	0.689	1.001	0.667	0.813
	(0.0892)	(0.198)	(0.313)	(0.307)	(0.243)
Total Observations	**3,956**	**3,956**	**3,956**	**3,956**	**3,956**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: created by the author based on the MCS data

Table C13. Effect of being an only-child, compared to having siblings, on behaviour scores, using a *continuous SDQ score*, by behaviour type and wave, abridged table (omitted controls)

	wave 2	wave 3	wave 4	wave 5	wave 6
SDQ total score	0.722***	1.105	1.437**	1.465*	1.589*
	(0.0840)	(0.151)	(0.256)	(0.328)	(0.375)
R^2	0.099	0.087	0.091	0.090	0.088
Peer score	1.157***	1.317***	1.441***	1.481***	1.479***
	(0.0475)	(0.0557)	(0.0871)	(0.112)	(0.127)
R^2	0.051	0.049	0.060	0.049	0.055
Hyperactivity score	0.981	1.098	1.347***	1.154	1.116
	(0.0476)	(0.0743)	(0.109)	(0.109)	(0.109)
R^2	0.063	0.071	0.075	0.086	0.094
Emotional score	0.925**	0.988	0.938	1.068	1.163*
	(0.0329)	(0.0440)	(0.0517)	(0.0776)	(0.0916)
R^2	0.027	0.027	0.028	0.034	0.060
Conduct score	0.687***	0.774***	0.789***	0.803***	0.827***
	(0.0339)	(0.0313)	(0.0369)	(0.0474)	(0.0563)
R^2	0.074	0.057	0.069	0.075	0.060
Pro-social score	1.296***	1.186***	1.148**	1.124**	1.147*
	(0.0672)	(0.0565)	(0.0666)	(0.0543)	(0.0888)
R^2	0.022	0.030	0.039	0.043	0.036
Total Observations	**9,595**	**11,000**	**10,403**	**10,765**	**9,372**

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: 1) the SDQ score varies between 0-40; the other scores vary between 0-10, where a higher score equals to higher degree of problematic behaviour. 2) For this regression, the pro-social scale is inverted, and a higher score relates to least problematic behaviour score.

Source: created by the author based on the MCS data

Table C14. Odds Ratio of having abnormal behaviours for only-children, compared to children with siblings, pooled data with waves 2-6, *including only those with resident father across all waves*, by behaviour type

	SDQ	Peer	Hyper.	Emot.	Cond.	Pros.
Sibship: has siblings (ref.) vs only-child	1.062	1.257***	0.987	0.916	0.773***	0.684*
	(0.114)	(0.109)	(0.0973)	(0.0902)	(0.0613)	(0.143)
Mother's religion (ref.: non-religious)						
Christian	0.724***	0.750***	0.748***	0.815***	0.804***	0.848**
	(0.0483)	(0.0344)	(0.0464)	(0.0386)	(0.0393)	(0.0643)
Other	1.408***	1.559***	1.161	1.346***	1.098	1.101
	(0.133)	(0.124)	(0.118)	(0.106)	(0.0877)	(0.132)
Mother is employed (ref.) vs not employed	1.653***	1.607***	1.319***	1.503***	1.261***	1.327***
	(0.103)	(0.0819)	(0.0749)	(0.0765)	(0.0636)	(0.0986)
Mother's age at birth	0.951***	0.974***	0.963***	0.974***	0.964***	1.006
	(0.00717)	(0.00571)	(0.00558)	(0.00541)	(0.00468)	(0.00793)
Gender male (ref.) vs female	0.655***	0.808***	0.443***	1.147***	0.706***	0.405***
	(0.0396)	(0.0375)	(0.0252)	(0.0563)	(0.0324)	(0.0286)
Wave (ref.: wave 2)						
Wave 3	0.395***	0.580***	1.178***	0.515***	0.537***	
	(0.0315)	(0.0317)	(0.0683)	(0.0340)	(0.0225)	
Wave 4	0.533***	0.623***	1.376***	0.677***	0.462***	0.789***
	(0.0381)	(0.0386)	(0.0773)	(0.0431)	(0.0206)	(0.0637)
Wave 5	0.679***	0.908*	1.110	1.063	0.452***	0.578***
	(0.0477)	(0.0519)	(0.0710)	(0.0637)	(0.0222)	(0.0478)
Wave 6	0.856**	1.338***	0.994	1.240***	0.454***	1.263***
	(0.0612)	(0.0742)	(0.0674)	(0.0737)	(0.0267)	(0.100)
Sibship x Wave						
Wave 3	1.151	1.401**	1.278*	1.187	0.902	
	(0.233)	(0.199)	(0.177)	(0.223)	(0.124)	
Wave 4	1.327	1.469**	1.481**	1.131	1.190	1.096
	(0.274)	(0.240)	(0.240)	(0.222)	(0.173)	(0.316)
Wave 5	1.415	1.426**	1.068	1.376*	1.028	0.724
	(0.310)	(0.239)	(0.202)	(0.244)	(0.186)	(0.279)
Wave 6	1.394	1.614***	1.055	1.544**	1.211	1.065
	(0.292)	(0.269)	(0.205)	(0.266)	(0.231)	(0.279)
Total Observations	**31,865**					

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Note: reference wave for pro-social model is wave 3.

Source: created by the author based on the MCS data

Bibliography

Adam, A. Y. (1991). Convergence on the two-child family norm in Australia. *Journal of the Australian Population Association*, *8*(2), 77–91. https://doi.org/10.1007/BF03029438

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Ajzen, I., & Klobas, J. (2013). Fertility intentions: An approach based on the theory of planned behavior. *Demographic Research*, *29*, 203–232. https://doi.org/10.4054/DemRes.2013.29.8

Alesina, A. F., & Giuliano, P. (2007). *Divorce, Fertility and the Value of Marriage* (SSRN Scholarly Paper No. ID 982406). Rochester, NY: Social Science Research Network. https://papers.ssrn.com/abstract=982406. Accessed 28 September 2019

Anderson, L. (2016). CSI-19-Inequalities-in-childrens-health.pdf. http://csi.nuff.ox.ac.uk/wp-content/uploads/2016/02/CSI-19-Inequalities-in-childrens-health.pdf. Accessed 17 May 2021

Andersson, G. (2002). Children's experience of family disruption and family formation: Evidence from 16 FFS countries. Demographic Research, 7, 343–364. https://doi.org/10.4054/DemRes.2002.7.7

Balbo, N., & Mills, M. (2011a). The influence of the family network on the realisation of fertility intentions. *Vienna Yearbook of Population Research*, *9*, 179–205.

Balbo, N., & Mills, M. (2011b). 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. https://doi.org/10.1080/00324728.2011.579148

Barclay, K., & Kolk, M. (2019). Parity and Mortality: An Examination of Different Explanatory Mechanisms Using Data on Biological and Adoptive Parents. *European Journal of Population*, *35*(1), 63–85. https://doi.org/10.1007/s10680-018-9469-1

Baskett, L. M. (1985). Sibling Status Effects: Adult Expectations. Developmental Psychology, 21(3), 441–445. https://doi.org/10.1037/0012-1649.21.3.441

Basten, S., Huinink, J., & Klüsener, S. (2011). Spatial Variation of Sub-national Fertility Trends in Austria, Germany and Switzerland. *Comparative Population Studies*, *36*(2–3). https://doi.org/10.12765/CPoS-2011-08

Beaujouan, E. (2020). Latest-Late Fertility? Decline and Resurgence of Late Parenthood Across the Low-Fertility Countries. *Population and Development Review*, *46*(2), 219–247. https://doi.org/10.1111/padr.12334

Beaujouan, E., & Berghammer, C. (2019). The Gap Between Lifetime Fertility Intentions and Completed Fertility in Europe and the United States: A Cohort Approach. *Population Research and Policy Review*, *38*(4), 507–535. https://doi.org/10.1007/s11113-019-09516-3

Beaujouan, E., Brzozowska, Z., & 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. https://doi.org/10.1080/00324728.2016.1206210

Becker, G. S. (1981). *A treatise on the family* (Enl. ed., 1. paperback ed., 4. print.). Cambridge, Mass.: Harvard Univ. Press.

Bengtson, V. L. (2001). Beyond the Nuclear Family: The Increasing Importance of Multigenerational Bonds. *Journal of Marriage and Family*, *63*(1), 1–16. https://doi.org/10.1111/j.1741-3737.2001.00001.x

Bernardi, F., Boertien, D., & Geven, K. (2019). Childhood Family Structure and the Accumulation of Wealth Across the Life Course. *Journal of Marriage and Family*, *81*(1), 230–247. https://doi.org/10.1111/jomf.12523

Billari, F. C., & Kohler, H.-P. (2004). Patterns of low and lowest-low fertility in Europe. *Population Studies*, *58*(2), 161–176. https://doi.org/10.1080/0032472042000213695

Billari, F. C., Philipov, D., & Testa, M. R. (2009). Attitudes, Norms and Perceived Behavioural Control: Explaining Fertility Intentions in Bulgaria. *European Journal of Population / Revue européenne de Démographie*, *25*(4), 439–465. https://doi.org/10.1007/s10680-009-9187-9

Billingsley, S., & Ferrarini, T. (2014). Family Policy and Fertility Intentions in 21 European Countries. *Journal of Marriage and Family*, *76*(2), 428–445. https://doi.org/10.1111/jomf.12097

Blake, J. (1981). The Only Child in America: Prejudice versus Performance. *Population and Development Review*, *7*(1), 43. https://doi.org/10.2307/1972763

Blake, J. (1989). *Family size and achievement*. Berkeley: University of California Press.

Blau, D. M., & Klaauw, W. van der. (2013). What Determines Family Structure? *Economic Inquiry*, *51*(1), 579–604. https://doi.org/10.1111/j.1465-7295.2010.00334.x

Bobbitt-Zeher, D., & Downey, D. B. (2013). Number of Siblings and Friendship Nominations Among Adolescents. Journal of Family Issues, 34(9), 1175–1193. https://doi.org/10.1177/0192513X12470370

Bongaarts, J. (2002). The End of the Fertility Transition in the Developed World. *Population and Development Review*, *28*(3), 419–443.

Bongaarts, J. (2011). Can Family Planning Programs Reduce High Desired Family Size in Sub-Saharan Africa? *International Perspectives on Sexual and Reproductive Health*, *37*(4), 209–216.

Bradatan, C., & Firebaugh, G. (2007). History, Population Policies, and Fertility Decline in Eastern Europe: A Case Study. *Journal of Family History*, *32*(2), 179–192. https://doi.org/10.1177/0363199006297732

Brée, S. (2017). Évolution de la taille des familles au fil des générations en France (1850-1966). *Population*, *72*(2), 309. https://doi.org/10.3917/popu.1702.0309

Brée, S., Eggerickx, T., & Sanderson, J.-P. (2017). Low fertility, childlessness and family changes in the first half of the 20th century in France and Belgium. *Quetelet Journal*, *5*(1), 7–31. https://doi.org/10.14428/rqj2017.05.01.01

Breton, D., & Prioux, F. (2009). The one-child family: France in the European context. *Demographic Research*, *20*, 657–692. https://doi.org/10.4054/DemRes.2009.20.27

Bryant, J. (2007). Theories of Fertility Decline and the Evidence from Development Indicators. *Population and Development Review*, *33*(1), 101–127.

Buhr, P., Lutz, K., & Peter, T. (2018). The influence of the number of siblings on expected family size in a cohort of young adults in Germany. *Demographic Research*, *39*, 315–336. https://doi.org/10.4054/DemRes.2018.39.10

Bumpass, L. L. (1990). What's Happening to the Family? Interactions Between Demographic and Institutional Change. *Demography*, *27*(4), 483. https://doi.org/10.2307/2061566

Caldwell, J. C. (1980). Mass Education as a Determinant of the Timing of Fertility Decline. *Population and Development Review*, *6*(2), 225–255. https://doi.org/10.2307/1972729

Caldwell, J. C., & Schindlmayr, T. (2003). Explanations of the fertility crisis in modern societies: A search for commonalities. *Population Studies*, *57*(3), 241–263. https://doi.org/10.1080/0032472032000137790

Casterline, J. B., & Agyei-Mensah, S. (2017). Fertility Desires and the Course of Fertility Decline in sub-Saharan Africa. *Population and Development Review*, *43*, 84–111.

Chanfreau, J., Barclay, K., Keenan, K., & Goisis, A. (2022). Sibling group size and BMI over the life course: Evidence from four British cohort studies. *Advances in Life Course Research*, *53*, 100493. https://doi.org/10.1016/j.alcr.2022.100493

Chanfreau, J., & Goisis, A. (2022a). Defining and Identifying Only Children Research decisions regarding the concept and measurement with survey data. *CLS working paper number 2022/3*. https://cls.ucl.ac.uk/wp-content/uploads/2017/02/CLS-Working-Paper-2022-3-Defining-and-Identifying-Only-Children.pdf. Accessed 19 December 2022

Chanfreau, J., & Goisis, A. (2022b). Patterns of help and care by adult only children and children with siblings. *Ageing and Society*, 1–24. https://doi.org/10.1017/S0144686X22000198

Chen, W.-C. (2015). Academic Performance of Only Children Who Monopolize Parental Resources: The Case of Taiwan. *Sociological Perspectives*, *58*(4), 609–626. https://doi.org/10.1177/0731121415578289

Chen, X., Rubin, K. H., & Li, B. (1994). Only Children and Sibling Children in Urban China: A Re-examination. *International Journal of Behavioral Development*, *17*(3), 413–421. https://doi.org/10.1177/016502549401700302

Cherlin, A. J. (1999). Going to extremes: Family structure, children's well-being, and social science. *Demography*, *36*(4), 421–428. https://doi.org/10.2307/2648081

Cherlin, A. J. (2004). The deinstitutionalization of American marriage. *Journal of Marriage and Family*, *66*(4), 848–861. https://doi.org/10.1111/j.0022-2445.2004.00058.x

Children's Commissioner. (2022). *Family and its protective effect part 1: Of the independent family review* [Family Review]. Access from: https://assets.childrenscommissioner.gov.uk/wpuploads/2022/12/cc-family-and-its-protective-effect-part-1-of-the-independent-family-review-.pdf

Choi, S., & Monden, C. (2017). Socioeconomic Status and Performance Outcomes of Only-children in a Cross-national Perspective. https://doi.org/10.31235/osf.io/kc6x5

Choi, S., & Monden, C. (2019). Where it matters to be the only one: School performance outcomes of only-children across 31 countries. SocArXiv.

Ciritel, A.-A., De Rose, A., & Arezzo, M. F. (2019). Childbearing intentions in a low fertility context: the case of Romania. *Genus*, *75*(1), 4. https://doi.org/10.1186/s41118-018-0046-6

Cohen, S. B., & Sweet, J. A. (1974). The Impact of Marital Disruption and Remarriage on Fertility. *Journal of Marriage and Family*, *36*(1), 87–96. https://doi.org/10.2307/350998

David, P. A., & Sanderson, W. C. (1987). The Emergence of a Two-Child Norm among American Birth-Controllers. *Population and Development Review*, *13*(1), 1–41. https://doi.org/10.2307/1972119

Dommermuth, L., Klobas, J., & 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. https://doi.org/10.1016/j.alcr.2011.01.002

Doren, C. (2019). Which Mothers Pay a Higher Price? Education Differences in Motherhood Wage Penalties by Parity and Fertility Timing. *Sociological Science*, *6*, 684–709. https://doi.org/10.15195/v6.a26

Dorius, S. F. (2008). Global Demographic Convergence? A Reconsideration of Changing Intercountry Inequality in Fertility. *Population and Development Review*, *34*(3), 519–537. https://doi.org/10.1111/j.1728-4457.2008.00235.x

Downey, D. B., & Condron, D. J. (2004). Playing well with others in kindergarten: The benefit of siblings at home. *Journal of Marriage and Family*, *66*(2), 333–350. https://doi.org/10.1111/j.1741-3737.2004.00024.x

Dufner, M., Back, M. D., Oehme, F. F., & Schmukle, S. C. (2020). The End of a Stereotype: Only Children Are Not More Narcissistic Than People With Siblings. *Social Psychological and Personality Science*, *11*(3), 416–424. https://doi.org/10.1177/1948550619870785

Dunn, J., Deater-Deckard, K., Pickering, K., O'Connor, T. G., Golding, J., & Team, the A. S. (1998). Children's Adjustment and Prosocial Behaviour in Step-, Single-parent, and Non-stepfamily Settings: Findings from a Community Study. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, *39*(8), 1083–1095. https://doi.org/10.1111/1469-7610.00413

Dykstra, P. A., & Wagner, M. (2007). Pathways to Childlessness and Late-Life Outcomes. *Journal of Family Issues*, *28*(11), 1487–1517. https://doi.org/10.1177/0192513X07303879

Elander, J., & Rutter, M. (1996). An Update on the Status of the Flutter Parents' and Teachers' Scales. Child Psychology and Psychiatry Review, 1(1), 31–35. https://doi.org/10.1111/j.1475-3588.1996.tb00006.x

Elizarov, V., & Levin, V. (2015). Family Policies in Russia: Could Efforts to Raise Fertility Rates Slow Population Aging? *World Bank Group, Russian Federation Aging Project*, 37.

Falbo, T. (1979). Only Children, Stereotypes, and Research. In M. Lewis & L. A. Rosenblum (Eds.), *The Child and Its Family* (pp. 127–142). Boston, MA: Springer US. https://doi.org/10.1007/978-1-4684-3435-4_8

Falbo, T. (1982). The One-Child Family in the United States: Research Issues and Results. *Studies in Family Planning*, *13*(6/7), 212. https://doi.org/10.2307/1965450

Falbo, T. (2020). Only Children. In *The Encyclopedia of Child and Adolescent Development* (pp. 1–9). American Cancer Society. https://doi.org/10.1002/9781119171492.wecad218

Falbo, T., & Polit, D. F. (1986). Quantitative review of the only child literature: Research evidence and theory development. *Psychological Bulletin*, *100*(2), 176–189. https://doi.org/10.1037/0033-2909.100.2.176

Falbo, T., & Poston, D. L. (1993). The Academic, Personality, and Physical Outcomes of Only Children in China. *Child Development*, *64*(1), 18–35. https://doi.org/10.1111/j.1467-8624.1993.tb02893.x

Fenske, J. (2015). African polygamy: Past and present. *Journal of Development Economics*, *117*, 58–73. https://doi.org/10.1016/j.jdeveco.2015.06.005

Fenton, N. (1928). The Only Child. *The Pedagogical Seminary and Journal of Genetic Psychology*, *35*(4), 546–556. https://doi.org/10.1080/08856559.1928.10532171

Frank, O. (1983). Infertility in sub-Saharan Africa: Estimates and Implications. *Population and Development Review*, *9*(1), 137–144. https://doi.org/10.2307/1972901

Frejka, T., Gietel-Basten, S., Abolina, L., Abuladze, L., Aksyonova, S., Akrap, A., et al. (2016). Fertility and family policies in Central and Eastern Europe after 1990. https://doi.org/10.12765/CPoS-2016-03en

Frejka, T., Hoem, J., & Sobotka, T. (2008). *Childbearing Trends and Policies in Europe*. BoD – Books on Demand.

Frejka, T., & Sardon, J.P. (2007). Cohort birth order, parity progression ratio and parity distribution trends in developed countries. *Demographic Research*, *16*, 315–374. https://doi.org/10.4054/DemRes.2007.16.11

Furstenberg, F. F. (2010). On a new schedule: transitions to adulthood and family change. *The Future of children*, *20*(1), 67–87. https://doi.org/10.1353/foc.0.0038

Gee, E. M. (1992). Only children as adult women: Life course events and timing. *Social Indicators Research*, *26*, 183–197.

Generations and Gender Surveys, Waves 1 and 2 (Data collection). DOIs: 10.17026/dans-z5z-xn8g, 10.17026/dans-xm6-a262. Available at https://www.ggp-i.org/.

Gerhardt, C. (2016). Only Children. In C. L. Shehan (Ed.), *Encyclopedia of Family Studies* (pp. 1–3). Hoboken, NJ, USA: John Wiley & Sons, Inc. https://doi.org/10.1002/9781119085621.wbefs042

Gerson, K., & Torres, S. (2015). Changing Family Patterns and the Future of Family Life. *Emerging Trends in the Social and Behavioral Sciences*. https://nyuscholars.nyu.edu/en/publications/changing-family-patterns-and-the-future-of-family-life. Accessed 20 April 2019

Gietel-Basten, S., & Rajbhar, M. (2018). One-child Ideation in India. https://doi.org/10.31235/osf.io/mtd7x

Glenn, N. D., & Hoppe, S. K. (1984). Only Children as Adults: Psychological Well-Being. *Journal of Family Issues*, *5*(3), 363–382. https://doi.org/10.1177/019251384005003005

Glick, P. C. (1984). Marriage, Divorce, and Living Arrangements: Prospective Changes. *Journal of Family Issues*, *5*(1), 7–26. https://doi.org/10.1177/019251384005001002

Goisis, A., Chanfreau, J., Moulton, V. and Ploubidis, G.B. (2023), Only Children and Cognitive Ability in Childhood: A Cross-Cohort Analysis over 50 Years in the United Kingdom. Population and Development Review, 49: 319-349. https://doi.org/10.1111/padr.12560

Goldani, A. M. (1993). As Famílias no Brasil contemporaneo e o mito da desestruturação, 44.

Goldstein, J., Lutz, W., & Testa, M. R. (2003). The emergence of Sub-Replacement Family Size Ideals in Europe. *Population Research and Policy Review*, *22*(5/6), 479–496. https://doi.org/10.1023/B:POPU.0000020962.80895.4a

Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A Research Note. *Journal of Child Psychology and Psychiatry*, *38*(5), 581–586. https://doi.org/10.1111/j.1469-7610.1997.tb01545.x

Greulich, A., Guergoat-Larivière, M., Thévenon, O., & Guerrouche, K. (2017). Emploi et deuxième naissance en Europe. *Population*, *72*(4), 653. https://doi.org/10.3917/popu.1704.0653

Guerra, F. F., Wajnman, S., & Turra, C. M. (2016). Disponibilidade de irmãos no Brasil: um estudo metodológico sobre relações de parentesco. *Revista Brasileira de Estudos de População*, *33*(1), 9–30. https://doi.org/10.20947/S0102-309820160002

Herrera, N. C., Zajonc, R. B., Wieczorkowska, G., & Cichomski, B. (2003). Beliefs about birth rank and their reflection in reality. Journal of Personality and Social Psychology, 85(1), 142–150. https://doi.org/10.1037/0022-3514.85.1.142

Hiekel, N., & Castro-Martín, T. (2014). Grasping the Diversity of Cohabitation: Fertility Intentions Among Cohabiters Across Europe: Fertility Intentions Among Cohabiters Across Europe. *Journal of Marriage and Family*, *76*(3), 489–505. https://doi.org/10.1111/jomf.12112

Hoffman, L. W. (1975). The Value of Children to Parents and the Decrease in Family Size. *Proceedings of the American Philosophical Society*, *119*(6), 430–438.

Högnäs, R. S., Roelfs, D. J., Shor, E., Moore, C., & Reece, T. (2017). J-Curve? A Meta-Analysis and Meta-Regression of Parity and Parental Mortality. *Population Research and Policy Review*, *36*(2), 273–308. https://doi.org/10.1007/s11113-016-9421-1

Human Fertility Database. Max Planck Institute for Demographic Research (Germany) and Vienna Institute of Demography (Austria). Available at www.humanfertility.org (data downloaded on December 2018).

Ibisomi, L., & Mudege, N. N. (2014). Childlessness in Nigeria: perceptions and acceptability. *Culture, Health & Sexuality*, *16*(1), 61–75. https://doi.org/10.1080/13691058.2013.839828

ICF. 2004-2017. Demographic and Health Surveys (various) [Datasets]. Funded by USAID. Rockville, Maryland: ICF [Distributor].

Islam, M., & Bairagi, R. (2003). Fertility intentions and subsequent fertility behaviour in MATLAB: Do fertility intentions matter? *Journal of biosocial science*, *35*, 615–9. https://doi.org/10.1017/S0021932003006072

Jefferies, J. (2001). A Reluctance to Embrace the One-Child Family in Britain? (p. 22). Presented at the The Second Demographic Transition in Europe, Bad Herrenalb, Germany.

Jiang, L., & O'Neill, B. C. (2007). Impacts of demographic trends on US household size and structure. *Population and Development Review*, *33*, 567–591.

Jiao, S., Ji, G., & Jing, Q. (1996). Cognitive Development of Chinese Urban Only Children and Children with Siblings. *Child Development*, *67*(2), 387. https://doi.org/10.2307/1131821

Jones, G. W. (2019). Ultra-low fertility in East Asia: policy responses and challenges. *Asian Population Studies*, *15*(2), 131–149. https://doi.org/10.1080/17441730.2019.1594656

Joyce, T., Kaestner, R., & Korenman, S. (2002). On the validity of retrospective assessments of pregnancy intention. *Demography*, *39*(1), 199–213. https://doi.org/10.1353/dem.2002.0006

Kohler, H.P. & Billari, F. & Ortega, J. (2006). Low Fertility in Europe: Causes, Implications and Policy Options. In F. R. Harris (Ed.), *The Baby Bust: Who Will Do the Work? Who Will Pay the Taxes?* (pp. 48–109). Rowman & Littlefield Publishers.

Kostova, D. (2008). *Union formation in times of social and economic change: Evidence from the Bulgarian and Russian GGS* (Doctorate Thesis). Faculty of Economics and Social Sciences at the University of Rostock, Rostock, Germany.

Kreyenfeld, M., & Konietzka, D. (Eds.). (2017). *Childlessness in Europe: Contexts, Causes, and Consequences*. Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-44667-7

Kuijsten, A. C. (1996). Changing family patterns in Europe: A case of divergence? *European Journal of Population / Revue européenne de Démographie*, *12*(2), 115–143. https://doi.org/10.1007/BF01797080

Lam, D., & Marteleto, L. (2013). Family Size of Children and Women during the Demographic Transition.

Laybourn, A. (1990). Only children in Britain: popular stereotype and research evidence. *Children & Society*, *4*(4), 386–400. https://doi.org/10.1111/j.1099-0860.1990.tb00375.x

Laybourn, A. (1994). *The Only Child: Myths and Reality*. Edinburgh: H.M.S.O.

Lee, R. (2003). The Demographic Transition: Three Centuries of Fundamental Change. *Journal of Economic Perspectives*, *17*(4), 167–190. https://doi.org/10.1257/089533003772034943

Lerch, M., & Spoorenberg, T. (2017). Fertility transition in sub-Saharan Africa: A view using parity progression ratios. Presented at the Proposal for a communication at the IUSSP Conference 2017, Cape Town, South Africa.

Lesthaeghe, R., & Van de Kaa, D. J. (1986). Twee demografische transities. *Bevolking: groei en krimp*, *1986*, 9–24.

Li, J., & Cooney, R. S. (1993). Son preference and the one child policy in China: 1979–1988. *Population Research and Policy Review*, 12(3), 277–296. https://doi.org/10.1007/BF01074389

Lima, E. E. C., Sobotka, T., & Zeman, K. (2018). Twentieth century changes in family size in Latin America – Analyses through cohort fertility and parity progression. Presented at the Population Association of America - 2018.

Macura, M. (1996). Fertility and nuptiality changes in Central and Eastern Europe: 1982–1993. *Statistical Journal of the United Nations Economic Commission for Europe*, *13*(1), 41–63. https://doi.org/10.3233/SJU-1996-13106

Mahringer, H., & Zulehner, C. (2015). Child-care costs and mothers' employment rates: an empirical analysis for Austria. *Review of Economics of the Household*, *13*(4), 837–870. https://doi.org/10.1007/s11150-013-9222-9

Mancillas, A. (2006). Challenging the Stereotypes About Only Children: A Review of the Literature and Implications for Practice. *Journal of Counseling & Development*, *84*(3), 268–275. https://doi.org/10.1002/j.1556-6678.2006.tb00405.x

Manski, C. F. (1990). The Use of Intentions Data to Predict Behavior: A Best-Case Analysis. *Journal of the American Statistical Association*, *85*(412), 934–940. https://doi.org/10.2307/2289590

Mellor, S. (1990). How Do Only Children Differ from Other Children? *The Journal of Genetic Psychology*, *151*(2), 221–230. https://doi.org/10.1080/00221325.1990.9914656

Miller, W. B., & Pasta, D. J. (1993). Motivational and nonmotivational determinants of child-number desires. *Population and Environment*, *15*(2), 113–138. https://doi.org/10.1007/BF02209405

Mills, M., Mencarini, L., Tanturri, M. L., & Begall, K. (2008). Gender equity and fertility intentions in Italy and the Netherlands. *Demographic Research*, *18*, 1–26.

Minnesota Population Center. Integrated Public Use Microdata Series, International: Version 7.2 [datasets]. Minneapolis, MN: IPUMS, 2019. https://doi.org/10.18128/D020.V7.2

Mönkediek, B., & Bras, H. (2018a). Family Systems and Fertility Intentions: Exploring the Pathways of Influence. *European Journal of Population*, *34*(1), 33–57. https://doi.org/10.1007/s10680-017-9418-4

Mönkediek, B., & Bras, H. (2018b). Family Systems and Fertility Intentions: Exploring the Pathways of Influence. *European Journal of Population*, *34*(1), 33–57. https://doi.org/10.1007/s10680-017-9418-4

Monnier, A. (1989). Fertility intentions and actual behaviour. A longitudinal study: 1974, 1976, 1979. *Population, English selection 1*(ES1), 237–259.

Morgan, S. P. (1991). Late Nineteenth-And Early Twentieth-Century Childlessness. *American Journal of Sociology*, *97*(3), 779–807.

Morgan, S. P. (2003). Is Low Fertility a Twenty-First-Century Demographic Crisis? *Demography*, *40*(4), 589–603. https://doi.org/10.1353/dem.2003.0037

Morgan, S. P., & Rackin, H. (2010). The Correspondence Between Fertility Intentions and Behavior in the United States. *Population and Development Review*, *36*(1), 91–118. https://doi.org/10.1111/j.1728-4457.2010.00319.x

Mosher, W. D., & Bachrach, C. A. (1982). Childlessness in the United States: Estimates from the National Survey of Family Growth. *Journal of Family Issues*, *3*(4), 517–543. https://doi.org/10.1177/019251382003004006

Mõttus, R., Indus, K., & Allik, J. (2008). Accuracy of only children stereotype. *Journal of Research in Personality*, *42*(4), 1047–1052. https://doi.org/10.1016/j.jrp.2007.10.006

Moultrie, T. A., Sayi, T. S., & Timæus, I. M. (2012). Birth intervals, postponement, and fertility decline in Africa: A new type of transition? *Population Studies*, *66*(3), 241–258. https://doi.org/10.1080/00324728.2012.701660

Neyer, G. (2003). *Family policies and low fertility in Western Europe* (No. WP-2003-021) (0 ed.). Rostock: Max Planck Institute for Demographic Research. https://doi.org/10.4054/MPIDR-WP-2003-021

Office for National Statistics (ONS), Census of England and Wales 2011 and 2021. Access: https://www.ons.gov.uk/

Ogg, J., & Renaut, S. (2006). The support of parents in old age by those born during 1945–1954: a European perspective. *Ageing & Society*, *26*(5), 723–743. https://doi.org/10.1017/S0144686X06004922

Olamijuwon, E., Odimegwu, C., & Chemhaka, G. (2021). Involuntary Childlessness and Marital Infidelity Among Women in Sub-Saharan African Countries: An Assessment of the Moderating Role of Women's Education. *Archives of Sexual Behavior*, *50*(2), 601–614. https://doi.org/10.1007/s10508-020-01770-3

Parr, N. (2007). Which women stop at one child in Australia? *Journal of Population Research*, *24*(2), 207–225. https://doi.org/10.1007/BF03031931

Paulhus, D. L., Trapnell, P. D., & Chen, D. (1999). Birth Order Effects on Personality and Achievement Within Families. *Psychological Science*, *10*(6), 482–488. https://doi.org/10.1111/1467-9280.00193

Perelli-Harris, B., & Gerber, T. P. (2011). Nonmarital Childbearing in Russia: Second Demographic Transition or Pattern of Disadvantage? *Demography*, *48*(1), 317–342. https://doi.org/10.1007/s13524-010-0001-4

Pesando, L. M. & GFC team. (2019). Global Family Change: Persistent Diversity with Development. *Population and Development Review*, *45*(1), 133–168. https://doi.org/10.1111/padr.12209

Philipov, D. (2002). *Fertility in times of discontinuous societal change: the case of Central and Eastern Europe* (No. WP-2002-024) (0 ed.). Rostock: Max Planck Institute for Demographic Research. https://doi.org/10.4054/MPIDR-WP-2002-024

Philipov, D., & Kohler, H.-P. (2001). Tempo Effects in the Fertility Decline in Eastern Europe: Evidence from Bulgaria, the Czech Republic, Hungary, Poland, and Russia. *European Journal of Population / Revue européenne de Démographie*, *17*(1), 37–60. https://doi.org/10.1023/A:1010740213453

Philipov, D., & Jasilioniene, A. (2007). Union formation and fertility in Bulgaria and Russia: a life table description of recent trends. MPIDR Working Paper, WP 2007-005.

Philipov, D., Spéder, Z., & Billari, F. C. (2006). Soon, later, or ever? The impact of anomie and social capital on fertility intentions in Bulgaria (2002) and Hungary (2001). *Population Studies*, *60*(3), 289–308. https://doi.org/10.1080/00324720600896080

Polit, D. F., Nuttall, R. L., & Nuttall, E. V. (1980). The Only Child Grows up: A Look at Some Characteristics of Adult Only Children. *Family Relations*, *29*(1), 99–106. https://doi.org/10.2307/583722

Poston, D. L., & Falbo, T. (1990). Academic Performance and Personality Traits of Chinese Children: "Onlies" Versus Others. *American Journal of Sociology*, *96*(2), 433–451.

Pradhan, I., & Sekher, T. V. (2014). Single-Child Families in India: Levels, Trends and Determinants. *Asian Population Studies*, *10*(2), 163–175. https://doi.org/10.1080/17441730.2014.909962

Präg, P., Choi, S., & Monden, C. W. S. (2018). *Sibship Size in Low-Fertility Countries over the Twentieth Century: Declining Social Disparities* (preprint). SocArXiv. https://doi.org/10.31235/osf.io/zvb9c

Prskawetz, A. (2007). Second Births in Austria. *Vienna Yearbook of Population Research*, *1*(2005), 143–170. https://doi.org/10.1553/populationyearbook2005s143

Quesnel-Vallée, A., & Morgan, S. P. (2003). Missing the Target? Correspondence of Fertility Intentions and Behavior in the U.S. *Population Research and Policy Review*, *22*(5), 497–525. https://doi.org/10.1023/B:POPU.0000021074.33415.c1

Régnier-Loilier, A., Vignoli, D., & Dutreuilh, C. (2011). Fertility Intentions and Obstacles to their Realization in France and Italy. *Population, Vol. 66*(2), 361–389.

Reher, D. S. (2011). Economic and Social Implications of the Demographic Transition. *Population and Development Review*, *37*(s1), 11–33. https://doi.org/10.1111/j.1728-4457.2011.00376.x

Riederer, B., & Buber-Ennser, I. (2018). Regional context and realization of fertility intentions: Are capitals different? The examples of Austria and Hungary. *Demográfia English Edition*, *61*(5), 29-58. https://doi.org/10.21543/DEE.2018.2

Riederer, B., Buber-Ennser, I., & Brzozowska, Z. (2019). Fertility Intentions and Their Realization in Couples: How the Division of Household Chores Matters. *Journal of Family Issues*, *40*(13), 1860–1882. https://doi.org/10.1177/0192513X19848794

Roberts, L. C., & Blanton, P. (2001). I always knew mom and dad love me best: Experiences of only children. *Journal of Individual Psychology*, *57*, 125–140.

Rochebrochard, E. de L., & Joshi, H. (2013). Siblings and child development. *Longitudinal and Life Course Studies*, *4*(3), 276–287. https://doi.org/10.14301/llcs.v4i3.248

Rosenberg, B. G., & Hyde, J. S. (1993). The Only Child: Is There Only One Kind of Only? *The Journal of Genetic Psychology*, *154*(2), 269–282. https://doi.org/10.1080/00221325.1993.9914740

Rosero-Bixby, L., Castro-Martín, T., & Martín-García, T. (2009). Is Latin America starting to retreat from early and universal childbearing? *Demographic Research*, *20*, 169–194.

Rowland, D. T. (2007). Historical Trends in Childlessness. *Journal of Family Issues*, *28*(10), 1311–1337. https://doi.org/10.1177/0192513X07303823

Scherger, S., Nazroo, J., & May, V. (2016, June 15). Work and Family Trajectories: Changes Across Cohorts Born in the First Half of the 20th Century. https://www.ifs.org.uk/publications/9226. Accessed 20 April 2019

Schoen, R., Astone, N. M., Kim, Y. J., Nathanson, C. A., & Fields, J. M. (1999). Do Fertility Intentions Affect Fertility Behavior? *Journal of Marriage and Family*, *61*(3), 790–799. https://doi.org/10.2307/353578

Schultz, T. P. (2001). *The Fertility Transition: Economic Explanations* (SSRN Scholarly Paper No. ID 286291). Rochester, NY: Social Science Research Network. https://papers.ssrn.com/abstract=286291. Accessed 28 September 2019

Semyonov, M., & Lewin-Epstein, N. (2013). Ways to Richness: Determination of Household Wealth in 16 Countries. *European Sociological Review*, *29*(6), 1134–1148. https://doi.org/10.1093/esr/jct001

Shen, J., & Yuan, B.-J. (1999). Moral Values of Only and Sibling Children in Mainland China. *The Journal of Psychology*, *133*(1), 115–124. https://doi.org/10.1080/00223989909599726

Shi, J., Li, L., Wu, D., & Li, H. (2021). Are only children always better? Testing the sibling effects on academic performance in rural Chinese adolescents. *Children and Youth Services Review*, *131*, 106291. https://doi.org/10.1016/j.childyouth.2021.106291

Shreffler, K. M., Tiemeyer, S., Dorius, C., Spierling, T., Greil, A. L., & McQuillan, J. (2016). Infertility and fertility intentions, desires, and outcomes among US women. *Demographic Research*, *35*, 1149–1168.

Singh, S., Casterline, J. B., & Cleland, J. G. (1985). The Proximate Determinants of Fertility: Sub-national Variations. *Population Studies*, *39*(1), 113–135. https://doi.org/10.1080/0032472031000141316

Sirvanli-Ozen, D. (2005). Impacts of Divorce on the Behavior and Adjustment Problems, Parenting Styles, and Attachment Styles of Children. *Journal of Divorce & Remarriage*, *42*(3–4), 127–151. https://doi.org/10.1300/J087v42n03_08

Sobotka, Tomas. (2003). Re-Emerging Diversity: Rapid Fertility Changes in Central and Eastern Europe after the Collapse of the Communist Regimes. *Population (English Edition, 2002-)*, *58*(4/5), 451–485. https://doi.org/10.2307/3246652

Sobotka, Tomas. (2009). Sub-Replacement Fertility Intentions in Austria. *European Journal of Population / Revue européenne de Démographie*, *25*(4), 387–412. https://doi.org/10.1007/s10680-009-9183-0

Sobotka, Tomas. (2011). Fertility in Central and Eastern Europe after 1989: Collapse and Gradual Recovery. *Historical Social Research Vol. 36, No. 2*(2011). https://doi.org/10.12759/hsr.36.2011.2.246-296

Sobotka, Tomáš. (2017). Childlessness in Europe: Reconstructing Long-Term Trends Among Women Born in 1900–1972. In M. Kreyenfeld & D. Konietzka (Eds.), *Childlessness in Europe: Contexts, Causes, and Consequences* (pp. 17–53). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-44667-7_2

Sobotka, Tomas, & Beaujouan, É. (2014). Two Is Best? The Persistence of a Two-Child Family Ideal in Europe. *Population and Development Review*, *40*(3), 391–419. https://doi.org/10.1111/j.1728-4457.2014.00691.x

Sobotka, Tomas, & Beaujouan, É. (2018). Late Motherhood in Low-Fertility Countries: Reproductive Intentions, Trends and Consequences. In D. Stoop (Ed.), *Preventing Age Related Fertility Loss* (pp. 11–29). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-14857-1_2

Sobotka, Tomas, & Testa, M. R. (2008). Attitudes and Intentions Toward Childlessness in Europe. In C. Höhn, D. Avramov, & I. E. Kotowska (Eds.), *People, Population Change and Policies: Lessons from the Population Policy Acceptance Study Vol. 1: Family Change* (pp. 177–211). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-1-4020-6609-2_9

Spéder, Z., & Kapitány, B. (2014). Failure to Realize Fertility Intentions: A Key Aspect of the Post-communist Fertility Transition. *Population Research and Policy Review*, *33*(3), 393–418. https://doi.org/10.1007/s11113-013-9313-6

Tavares, M. B., Fuchs, F. C., Diligenti, F., Abreu, J. R. P. de, Rohde, L. A., & Fuchs, S. C. (2004). Behavioral characteristics of the only child vs first-born and children with siblings. *Brazilian Journal of Psychiatry*, *26*, 17–23. https://doi.org/10.1590/S1516-44462004000100007

Testa, M. R., & Basten, S. (2014). Certainty of meeting fertility intentions declines in Europe during the 'Great Recession.' *Demographic Research*, *31*, 687–734.

Timæus, I. M., & Moultrie, T. A. (2020). Pathways to Low Fertility: 50 Years of Limitation, Curtailment, and Postponement of Childbearing. *Demography*, *57*(1), 267–296. https://doi.org/10.1007/s13524-019-00848-5

Thornton, A. (1978). Marital dissolution, remarriage, and childbearing. Demography, 15(3), 361–380. https://doi.org/10.2307/2060656

Tosi, M., & Grundy, E. (2018). Returns home by children and changes in parents' well-being in Europe. *Social Science & Medicine*, *200*, 99–106. https://doi.org/10.1016/j.socscimed.2018.01.016

Toulemon, L., & Testa, M. R. (2005). Fertility intentions and actual fertility: A complex relationship.

University of London, Institute of Education, Centre for Longitudinal Studies. (2020). Millennium Cohort Study: Longitudinal Family File, 2001-2018. [data collection]. 4th Edition. UK Data Service. SN: 8172, DOI: 10.5255/UKDA-SN-8172-4

University of London, Institute of Education, Centre for Longitudinal Studies. (2020). Millennium Cohort Study: Age 9 months, Sweep 1, 2001. [data collection]. 14th Edition. UK Data Service. SN: 4683, DOI: 10.5255/UKDA-SN-4683-6

University of London, Institute of Education, Centre for Longitudinal Studies. (2020). Millennium Cohort Study: Age 3, Sweep 2, 2004. [data collection]. 11th Edition. UK Data Service. SN: 5350, DOI: 10.5255/UKDA-SN-5350-6

University of London, Institute of Education, Centre for Longitudinal Studies. (2020). Millennium Cohort Study: Age 5, Sweep 3, 2006. [data collection]. 9th Edition. UK Data Service. SN: 5795, DOI: 10.5255/UKDA-SN-5795-6

University of London, Institute of Education, Centre for Longitudinal Studies. (2020). Millennium Cohort Study: Age 7, Sweep 4, 2008. [data collection]. 9th Edition. UK Data Service. SN: 6411, DOI: 10.5255/UKDA-SN-6411-9

University of London, Institute of Education, Centre for Longitudinal Studies. (2020). Millennium Cohort Study: Age 11, Sweep 5, 2012. [data collection]. 6th Edition. UK Data Service. SN: 7464, DOI: 10.5255/UKDA-SN-7464-6

University of London, Institute of Education, Centre for Longitudinal Studies. (2020). Millennium Cohort Study: Age 14, Sweep 6, 2015. [data collection]. 7th Edition. UK Data Service. SN: 8156, DOI: 10.5255/UKDA-SN-8156-7

University of London, Institute of Education, Centre for Longitudinal Studies. (2020). Millennium Cohort Study: Age 17, Sweep 7, 2018. [data collection]. 2nd Edition. UK Data Service. SN: 8682, DOI: 10.5255/UKDA-SN-8682-2

Van Bavel, J., & Nitsche, N. (2013). "The Proper Age for Parenthood" and Second Birth Rates in Europe. *European Sociological Review*, *29*(6), 1149–1161. https://doi.org/10.1093/esr/jct003

Van Bavel, Jan, & Rózańska-Putek, J. (2016). Low Second Birth Rates in Eastern and Southern Europe: Interactions between Economic Uncertainty and Norms about Parenthood. In T. Roosalu & D. Hofäcker (Eds.), *Rethinking Gender, Work and Care in a New Europe: Theorizing Markets and Societies in the Post-Postsocialist Era* (pp. 64–83). London: Palgrave Macmillan UK. https://doi.org/10.1057/9781137371096_4

Van Dijk, R., Van der Valk, I. E., Deković, M., & Branje, S. (2020). A meta-analysis on interparental conflict, parenting, and child adjustment in divorced families: Examining mediation using meta-analytic structural equation models. *Clinical Psychology Review*, *79*, 101861. https://doi.org/10.1016/j.cpr.2020.101861

Veenhoven, R., & Verkuyten, M. (1989). The well-being of only children. *Adolescence*, *24*(93), 155–166.

Wang, D., Kato, N., Inaba, Y., Tango, T., Yoshida, Y., Kusaka, Y., et al. (2000). Physical and personality traits of preschool children in Fuzhou, China: only child vs sibling. *Child: Care, Health and Development*, *26*(1), 49–60. https://doi.org/10.1046/j.1365-2214.2000.00143.x

Wineberg, H. (1990). Childbearing after Remarriage. *Journal of Marriage and Family*, *52*(1), 31–38. https://doi.org/10.2307/352835

Yang, F., & Weng, W. (2021). Are only-children difficult team members? *Applied Economics*, *53*(47), 5462–5476. https://doi.org/10.1080/00036846.2021.1923637

Zeman; K.; Z. Brzozowska; T. Sobotka; E. Beaujouan; A. Matysiak. 2014. Cohort Fertility and Education database. Methods Protocol. Available at www.eurrep.org

Zhang, J. (2017). The Evolution of China's One-Child Policy and Its Effects on Family Outcomes. *Journal of Economic Perspectives*, *31*(1), 141–160. https://doi.org/10.1257/jep.31.1.141

Zheng, X., Su, Q., Jing, C., & Zhang, Y.-Y. (2022). They Are Not Little Emperors: Only Children Are Just as Altruistic as Non-Only Children. *Social Psychological and Personality Science*, *13*(2), 543–552. https://doi.org/10.1177/19485506211038190