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When Is the Family Complete? Long-Acting Contraceptive Use
Among Mothers in Eight European Countries

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Title (English)

When Is the Family Complete? Long-Acting Contraceptive Use Among Mothers in Eight European Countries

Abstract (English)

For women who want to avoid pregnancy, long-acting contraceptives—such as the IUD, injection, and sterilization—are among the most effective means of enacting fertility preferences. Across Europe, these methods are used most frequently by older women with two or more children, whereas younger nulliparous women tend to rely on other methods of contraception. This pattern suggests that women may use different contraceptive methods according to the stage of their reproductive career, with long-acting contraception enabling motivations to prevent any future childbearing. Focusing on women who are currently using contraception, this thesis examines how method use varies among women who have already begun childbearing. Using data from eight European countries in Round II of the Generations and Gender Survey (2020–2024), logistic regression models are used to investigate the association between parity and long-acting contraceptive use during the reproductive life. Consistent with previous research, the findings show that women with two or more children are more likely to use long-acting contraception than women with one child, with use additionally varying across age. To account for potential differences in anticipated childbearing between parity groups, the analyses are repeated on a restricted sample of contraceptive users who report no short-term fertility intentions. The parity-differentials observed in the baseline sample largely persist, suggesting that contraceptive behavior is only partially motivated by fertility preferences. Overall, the findings support the proposition that multiparous women use long-acting contraception as a means of achieving fertility stopping, while also indicating that this relationship is neither universal nor uniform across countries.

Keywords (English)

Long-Acting Contraception, Parity Progression, Reproductive Life Course, Fertility Regulation, Fertility Intentions, Generations and Gender Survey

Titel (Deutsch)

Wann ist die Familie Komplett? Die Anwendung Langwirksamer Verhütungsmittel bei Müttern in Acht Europäischen Ländern

Zusammenfassung (Deutsch)

Für Frauen, die eine Schwangerschaft vermeiden möchten, gehören Langzeitverhütungsmethoden – wie die Spirale, die Injektion und die Sterilisation—zu den wirksamsten Methoden, um ihre Fertilitätspräferenzen zu realisieren. In ganz Europa werden diese Methoden am häufigsten von älteren Frauen mit zwei oder mehr Kindern angewendet, während jüngere, noch kinderlose Frauen eher auf andere Verhütungsmethoden zurückgreifen. Dieses Muster deutet darauf hin, dass Frauen je nach Phase ihrer reproduktiven Laufbahn unterschiedliche Verhütungsmethoden anwenden, wobei Langzeitverhütungsmethoden den Wunsch unterstützen, eine weitere Schwangerschaft zu verhindern. Mit Fokus auf Frauen, die derzeit Verhütungsmittel anwenden, untersucht diese Arbeit, wie sich die Methodenwahl bei Frauen unterscheidet, die bereits Kinder bekommen haben. Anhand von Daten aus acht europäischen Ländern aus der zweiten Runde der „Generations and Gender Survey“ (2020–2024) wird mithilfe logistischer Regressionsmodelle der Zusammenhang zwischen der Parität und der Anwendung Langzeitverhütungsmethoden während des reproduktiven Lebens untersucht. In Übereinstimmung mit früheren Forschungsergebnissen zeigen die Befunde, dass Frauen mit zwei oder mehr Kindern mit höherer Wahrscheinlichkeit langwirksame Verhütungsmittel anwenden als Frauen mit einem Kind, wobei die Anwendung zudem je nach Alter variiert. Um mögliche Unterschiede in den erwarteten Geburtenplänen zwischen den verschiedenen Paritätsgruppen zu berücksichtigen, werden die Analysen anhand einer eingeschränkten Stichprobe von Verhütungsmittelanwenderinnen wiederholt, die keine kurzfristigen Kinderwünsche angeben. Die in der Ausgangsstichprobe beobachteten Unterschiede zwischen den Paritätsgruppen bleiben weitgehend bestehen, was darauf hindeutet, dass das Verhütungsverhalten nur teilweise durch Kinderwünsche motiviert ist. Insgesamt stützen die Ergebnisse die These, dass multipare Frauen Langzeitverhütungsmethoden nutzen, um eine Beendigung der Fertilität zu erreichen. Gleichzeitig weisen sie jedoch darauf hin, dass dieser Zusammenhang weder universell gilt noch länderübergreifend einheitlich ist.

Stichwörter(Deutsch)

Langzeitverhütungsmethoden, Entwicklung der Geburtenzahl, Reproduktiver Lebensverlauf, Fertilitätsregulierung, Fertilitätsabsichten, Generations and Gender Survey

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“Experience is a brutal teacher. But you learn. My god do you learn.”

William Nicholson, 1993

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1. INTRODUCTION

In its primary role as pregnancy prevention, contraception plays a central role in shaping a population's fertility levels. Although it has always been used for fertility control, the introduction of highly effective modern contraceptives in the 1960s fundamentally transformed the extent to which individuals could reliably use contraception as a means of fertility regulation ([Anderson & Johnston, 2023](#)). This “Contraceptive Revolution” brought a new era of reproductive individualization associated with profound societal and demographic changes in late twentieth-century Europe ([Westoff & Ryder, 1977](#)). During this time, contraceptive use spread widely, as it was considered more effective, accessible, and socially acceptable ([Frejka, 2008](#)). While the exact mechanisms are debated, these changes are widely agreed upon to have catalyzed recent demographic trends such as the reduction in unwanted fertility and higher-order births, the decoupling of marriage and childbirth, and the increase in delayed childbearing ([Lesthaeghe & van de Kaa, 1986](#)). Perhaps one of the more understated effects of the spread of modern contraception was the role it played in changing the societal understanding of fertility regulation. Prior to the Contraceptive Revolution, contraception was seen as a means of pregnancy prevention only *after* fertility ideals had been achieved ([Sobotka, 2004](#)). After the invention and diffusion of modern contraception, however, contraceptive use became normalized throughout the entire reproductive life, resulting in women gaining autonomy in determining *how* and *when* they have children ([Leridon, 1981](#); [van de Kaa, 1997](#)).

Today, most women in Europe use contraception for at least some share of their reproductive life, although usage rates vary systematically according to various individual and environmental determinants ([Cibula, 2008](#); [Klijzing, 2000](#); [Lindh et al., 2010](#)). Patterns of use also differ greatly according to each type of contraception. Among younger nulliparous women, more temporary—and by result, less effective—contraceptives are most frequently used, while older multiparous women tend toward long-acting methods that are more permanent and of higher efficacy ([Bajos et al., 2012](#); [Bearak et al., 2020](#); [Eeckhaut et al., 2014](#); [Skjeldstad, 1994](#)). This pattern suggests that women may use different contraceptive methods according to the stage of their reproductive life, with long-acting contraceptives specifically being used as a means of ending the fertility career through fertility stopping. To date, existing research on this relation is somewhat limited, having

been rarely examined beyond descriptive comparisons and generally confined to the national level (e.g., Gray & McDonald, 2010). More broadly, while evidence finds an association between fertility preferences and contraceptive use overall (e.g., Dereuddre et al., 2016; Passet-Wittig & Lück, 2025; Skouby, 2004; Testa, 2012), less is known about how fertility preferences are reflected in the use of different contraceptive methods.

This thesis aims to contribute toward these gaps by examining patterns of method-specific contraceptive use among women who have already begun childbearing. Using data from eight European countries in Round II of the Generations and Gender Survey (2020–2024), logistic regression models are used to investigate the association between parity and long-acting contraceptive use during the reproductive life. Accordingly, the primary research question is as follows: *Among parous women, is parity associated with the use of long-acting contraceptive methods and, if so, does this association vary by reproductive age and by country?* The use of long-acting contraceptives is evaluated in comparison to all other types of contraception, representing the method mix available to women who use contraception to practice pregnancy prevention. Further, to account for potential differences in anticipated childbearing between parity groups, the analyses are repeated on a restricted sample of contraceptive users who report no short-term fertility intentions. As such, the secondary research question is: *How do the associations between parity and long-acting contraceptive use differ when the analysis is restricted to women reporting no short-term fertility intentions?*

In answering these questions, the research advances the understanding of the relationship between fertility preferences and fertility-regulation behavior. By conducting a cross-national comparison of European countries, this research provides contemporary evidence on women's reproductive behavior that is relevant to individuals decision-makers alike. Finally, by examining contraceptive use across parity and age, this thesis highlights the intersectional nature of fertility, and its position within women's broader reproductive life.

1.1. Structure of the Thesis

This thesis is structured as follows: [Chapter 2](#) presents the theoretical background in three sections focused on contraception, fertility preferences, and the association between the two. The chapter begins in [Section 2.1](#) by providing an introduction to contraception, presenting the various terminology and common measures, the differences between different types of methods, and discussing some of the constraints and barriers to contraceptive access. [Section 2.2](#) then focuses on fertility preferences, including the terminology used, meaningful ways in which preferences can vary, and some of the determinants of fertility preferences. Then, [Section 2.3](#) presents contraception as a means of enacting fertility preferences, including the various theories, trends, mechanisms, and additional considerations of this relationship.

Building on the theoretical background, [Chapter 3](#) presents the empirical evidence of long-acting contraceptive use in two sections. [Section 3.1](#) explore long-acting contraception, focusing on evidence of how use changes across the reproductive life course and dependent on other key variables. In [Section 3.2](#) the institutional considerations of long-acting contraceptive use are explored. The differing contraceptive and family welfare regimes are presented and discussed in relation to fertility preferences and contraceptive selection.

[Chapter 4](#) presents the analytical framework of the study, defining the primary and secondary research questions ([Section 4.2](#) and [4.3](#), respectively), and the related key constructs and hypotheses. [Chapter 5](#) describes the data and methodology used. [Section 5.1](#) provides detail on the data used from the Generations and Gender Survey, and the methods used for sample selection. This is followed by [Section 5.2](#) which presents the variables of analysis, and [Section 5.3](#) which overviews the analytical strategy.

[Chapter 6](#) presents the results of the analysis in three sections. [Section 6.1](#) shows the descriptive findings, presenting the distribution of long-acting contraceptive users by country, parity, and five-year age groups. [Section 6.2](#) then presents the findings of the multivariate analysis using the baseline sample, with results presented as average marginal effects, predicted probabilities, and differences in predicted probabilities. Finally, in [Section 6.3](#) the original sample is restricted to include only women who report no fertility intention within the next three years. Both descriptive and multivariate results are presented here similarly to the baseline sample.

Chapter 7 discusses the findings of the analysis. In Section 7.1, the hypotheses are evaluated in context of the results. Then, Section 7.2 details three broader implications of the findings, interpreting the results in relation to theoretical expectations and previous literature and evidence. The chapter concludes by discussing the limitations of the study (Section 7.3), as well as suggesting directions for future research (Section 7.4).

Chapter 8 provides the conclusions of the thesis, summarizing the key contributions and providing final thoughts for consideration. Chapters 9–12 provides all supplementary material. This includes end notes (Chapter 9), references (Chapter 10), indexes of figures and tables (Chapter 11), and an appendix of figures and tables (Chapter 12).

2. THEORETICAL BACKGROUND

In this chapter, the prerequisite theoretical background is presented in three sections. The chapter begins in [Section 2.1](#) by providing an introduction to contraception, including relevant terminology, distinguishers, and factors of use. [Section 2.2](#) then focuses on fertility preferences, and how they are conceptualized and believed to be determined. To conclude, [Section 2.3](#) presents contraception as a means of enacting fertility preferences, including the various theories, trends, mechanisms, and additional considerations of this relationship. To this end, the following background and subsequent research will primarily focus on the experience of women¹, as they bear the predominant health, economic, and social consequences of contraceptives use and non-use ([Fennell, 2011](#); [Wiggington et al., 2015](#); [Zettermark, 2023](#)).

2.1. Contraception

Contraception is generally understood to be the deliberate use of methods or techniques to prevent pregnancy. Methods can vary substantially from one another, and users face numerous considerations when considering whether or not to use any contraception, and if so, what method of contraception to use. This section will explore this complexity, examining how different contraceptive methods are evaluated and what determines contraceptive access.

2.1.1. Contraceptive Typology

Briefly, this sub-section reviews common measurements and classifications of contraception, although it is by no means considered to be exhaustive.

2.1.1.1. Measuring Contraception

Population measurements of contraceptive use are traditionally assessed using one of two indicators: the Contraceptive Prevalence Rate (CPR) or the Unmet Need for Family Planning (Unmet Need). Of the two, the CPR is considered to be a more general measurement, as it is an aggregate estimate of contraceptive use among all women of reproductive age (15 to 49) ([United](#)

¹ While it is acknowledged that pregnancy prevention is applicable to various gender identities, in order to be consistent with previous literature, this research is confined to the experiences of self-identified women.

Nations Department of Economic and Social Affairs [UN DESA], 2022). In contrast, Unmet Need is more complex, trying to measure how many women have an unmet need for pregnancy prevention in a given population. Women who are considered to be at-risk of pregnancy and report no immediate desire for childbearing are considered in *demand* for contraception, and their *need* for contraception is evaluated according to whether or not they use any method (Bradley et al., 2012). In practice, CPR is the most commonly used measurement due to its ease of calculation and interpretation, while the Unmet Need for Family Planning is generally applied only in high-fertility, low-income populations².

2.1.1.2. Classifying Contraceptive Methods

There are two standard methods of categorizing contraception. The first is to classify contraceptives as either “modern” or “traditional”, where methods are grouped according to the capacity for technology to influence the effectiveness of the method (UN DESA, 2022). Common modern contraceptives include the male condom, oral pill, and the intrauterine device (IUD), while common traditional methods include withdrawal and fertility awareness methods (Anderson & Johnston, 2023). In Europe today, modern contraceptives are the dominant method type, although traditional methods are still used (Westoff & Ryder, 1977).

The second classification of contraception is according to the duration of the method, which is considered the length of time that the method can reliably prevent pregnancy (Festin et al., 2016). Generally, there are three types of methods, which can be broadly thought of in terms of single-use or daily (short-acting), months or years (long-acting), or the lifetime (permanent). Contraceptives such as the male condom and the oral pill are considered short-acting, the IUD is long-acting, and sterilization is classified as permanent. In some instances, long-acting contraception is considered to encompass both long-acting and permanent methods, while in others the two are separated—this is delineated by the term LARC, or long-acting reversible contraceptives. In this thesis, unless otherwise specified, the former classification applies. Across Europe, estimates of use of these methods are varied among different groups of women, with short-

² The Unmet Need for Family Planning indicator is widely criticized on the basis of several analytical and conceptual underpinnings. These are outside the scope of this thesis; for a thorough review, refer to Fabic (2022), Karra (2022), and Senderowicz and Maloney (2022).

acting methods generally favored among younger women with no children, and long-acting or permanent methods used by older women with children (Cibula, 2008; Eeckhaut et al., 2014; Haimovich, 2009; Klijzing, 2000).

2.1.2. Contraceptive Evaluation

Contraceptive selection can be a very personal decision³. Women evaluate characteristics of contraception differently from one another, varying in the extent to which they prioritize hormonal, social, relational, and sexuality-related attributes (Sanders et al., 2026). Differences are found in both method selection as well as method satisfaction, with ultimately no clear consensus on a hierarchy of values (Faustmann et al., 2019; Peipert et al., 2011). In a review of studies, Alspaugh and colleagues (2020) found that perhaps the most common theme of contraceptive evaluation and choice is agency. They describe how contraception can be used as a means of exerting agency, allowing women to, “advocate for themselves, their children, or their future...A woman’s desire for contraceptive agency may be more important than the perceived effectiveness as understood by her health care provider.” (pp. 81-82). The expression of agency can be moderated by four factors of individual choice: contraceptive goals, contraceptive competence, contraceptive evaluation, and contraceptive access (Bulatao, 1989; 2019). In this sub-section, some of the different attributes of contraceptives will be explored, and the considerations women face when evaluating what method to use.

2.1.2.1. Effectiveness

Effectiveness is one of the main considerations for women when deciding which contraceptive method to use (Sanders et al., 2026; Scharmanski & Hessling, 2024). It is measured as the ability of the contraceptive to prevent pregnancy and is calculated as the probability of experiencing an unintended pregnancy within the first year of use. This is determined under two different scenarios: perfect use of the method or typical use. For long-acting contraceptives this distinction is negligible, as these methods can only be used with the assistance of a medical professional, and the duration of these tends to be months if not years (Festin et al., 2016). However, due to their

³ Occasionally, terms such as “decision” and “choice” are used in this thesis in reference to contraceptive use. While many users are able to exercise autonomy over their contraceptive behavior, it is important to acknowledge that contraceptive use is not always representative of a choice and instead can be the result of constraint or coercion (Alspaugh et al., 2020).

user dependence, this difference can be significant for short-acting contraceptives. Using the oral pill as an example, while with perfect use only 0.3% of women are estimated to have an unintended pregnancy within the first year of use, this estimate rises to 7% under typical use (Polis et al., 2026). Similarly, under conditions of perfect use only 2% of condom users will experience an unintended pregnancy within one year, compared to 13% of typical users (Polis et al., 2026). More broadly, due to the differences in user control, long-acting contraceptives are considered to be more effective at preventing pregnancy than short-acting methods (Bearak et al., 2020). Despite this, the perception of effectiveness is subject to misconceptions, with women generally overestimating the effectiveness of short-acting methods and underestimating the effectiveness of long-acting methods (McNicholas et al., 2014; Secura et al., 2010).

2.1.2.2. Duration of Use

Contraceptives can vary drastically in the duration of use, measured as the length of time that the method can reliably prevent pregnancy (Festini et al., 2016). A primary distinction is whether or not a contraceptive is episodic—that is, if it requires intervention at the time of intercourse. Due to their single use, episodic methods are considered to be the least effective type of contraception, as they are prone to misuse or method error (Bearak et al., 2020). Examples of episodic contraceptives include the male condom, withdrawal, and rhythm, and these methods have an approximate 13–20% rate of accidental pregnancy under typical use (Polis et al., 2026). In contrast, non-episodic methods are any contraceptive that is used independent of intercourse. Women use these methods for a range of reasons, including the ease of use, the increased effectiveness (approximately 0.1%–7% under typical use), the duration of use, and non-contraceptive benefits (Brant et al., 2017; Egarter et al., 2013; Polis et al., 2026; Scharmanski & Hessling, 2024). The exact duration of non-episodic methods can vary significantly, as these methods can be either short-acting, long-acting, or permanent.

2.1.2.3. Role of the Healthcare Provider

Some contraceptives require extensive healthcare provider intervention, while others require none at all. Typically, obtaining episodic contraception can be done discreetly and without the role of a provider, while non-episodic contraception requires the help of a medical provider (Festini et al., 2016). For some methods, such as the oral pill or the vaginal ring, initiation of use requires a prescription, which can typically be obtained in a single medical visit. However, the role of the

provider can be much more extensive for contraceptives with a longer duration. All long-acting contraception requires medical-assisted initiation, with services including injections, insertion of the contraceptive, or a surgical procedure. For some women, this healthcare provider-based control can discourage use of long-acting contraceptives (Alspaugh et al., 2020). Furthermore, in addition to initiation, almost all long-acting contraceptives require a procedure with a medical practitioner to discontinue use, which can present another barrier to use.

2.1.2.4. Side Effects and Safety Concerns

Although modern contraception is generally considered safe and with minimal long-term risks, women often report the opposite perception (Alspaugh et al., 2020). Common safety concerns for women include side effects and concern about future fertility (Le Guen et al., 2020; Lindh et al., 2016). Contraceptive side effects are relatively common and are considered as one of the most typical reasons women discontinue use of methods (Lindh et al., 2016; Teunissen et al., 2025). While exact effects vary depending on the exact contraceptive method, examples of side effects can include menstrual bleeding changes, benign ovarian cysts, abdominal or pelvic pain, and headaches or migraines (Teal & Edelman, 2021). Compared to side effects, concerns about the effect of contraception on future fertility are generally unfounded. Research has found that regardless of the contraceptive used (with the exception of sterilization), fertility comes back after contraceptive discontinuation (Girum & Wasie, 2018; Whaley & Burke, 2015).

2.1.2.5. Non-Contraceptive Benefits

While the primary motivation of contraceptive use is considered to be pregnancy prevention, many women use contraception for non-contraceptive benefits (Bahamondes et al., 2015; Brant et al., 2017). Data is limited, but available estimates report that close to half of all contraceptive users use contraception for a non-contraceptive benefit, and roughly 10% of women use contraception solely for a non-contraceptive purpose (Cagnacci et al., 2023; Jones, 2011). Moreover, non-contraceptive benefits are found to be the most cited reason women report switching contraceptive methods (Wigginton et al., 2016). The most common benefits reported are menstrual, as various types of contraceptives can help with regulation, pain relief, and symptoms (Bahamondes et al., 2015; Brant et al., 2017; Egarter et al., 2013). Certain hormonal long-acting contraceptives—such as specific variations of the IUD—can offer menstrual suppression and have been found to be protective against certain gynecological cancers (Bahamondes et al., 2015; Brant et al., 2017).

Contraception can also offer unique benefits for women experiencing perimenopausal or menopausal symptoms, the benefits of which have been found to influence method choice (Devalla, 2024; ESHRE Capri Workshop Group, 2009; Genazzani et al., 2025; Grandi et al., 2022; Whitburn et al., 2025).

2.1.2.6. Summary

Considerations for contraceptive selection can be wide-ranging, and not all attributes are of equal relevance to users. Aside from concerns of safety and effectiveness, women tend to prioritize different aspects such as duration, hormonal presence, the role of the provider, and side effects. However, when evaluating contraceptive method use it is important to examine not just method evaluation but method access, as the ability to translate contraceptive preferences into behavior can vary.

2.1.3. Contraceptive Access

In a perfect world, equitable access to contraception would be considered to be where: “everyone can make contraceptive decisions that best fit their values, needs, and preferences.” (Steiner et al., 2025, p. 2). However, despite individual evaluation of different contraceptive methods, contraceptive behavior is also influenced by individual circumstances, the surrounding social networks, the quality of health services, and the larger institutional environment (D’Souza et al., 2022). The following sub-section will explore these spheres of influence and how they can affect contraceptive use and behavior.

2.1.3.1. Individual Determinants

Contraceptive use and method selection vary according to several individual determinants. While most women in Europe use contraception for at least some share of their reproductive life (Lindh et al., 2010; Sköld & Larsson, 2012), use has been shown to vary systematically, with the highest levels of use reported among younger, nulliparous women (Cibula, 2008; Klijzing, 2000). Research finds that life-stage factors such as parity and age have the strongest association with contraceptive use, while socioeconomic characteristics play an important but more minor role (Lindh et al., 2010; Ruiz-Muñoz & Perez, 2013). This relationship holds when differentiating contraceptive use according to method type, although use is found to vary significantly across

parity and age groups. Among younger nulliparous women, short-acting contraceptive methods are most frequently used, while older multiparous women tend toward long-acting contraceptives (Bearak et al., 2020; Eeckhaut et al., 2014; Gray & McDonald, 2010; Haimovich, 2009; Kristensen & Lidegaard, 2021; Poncet et al., 2025; Sköld & Larsson, 2012). Research has also found contraceptive method selection to vary according to factors such as current partnership status (Firman et al., 2018), postpartum status (Larsen et al., 2025; Lucke et al., 2011), socioeconomic status (Buhr & Castiglioni, 2017), and fertility preferences (Dereuddre et al., 2016; Passet-Wittig & Lück, 2025).

2.1.3.2. Social Environment

In Europe today, the contraceptive method mix—the distribution of contraceptives used within a population—is the result of the sociocultural diffusion of modern contraceptives (Westoff & Ryder, 1977). Contraceptive behavior is strongly shaped by the social environment through mechanisms such as social awareness, networks, and norms. Contraceptive awareness depends on the diffusion of information, including the purpose of contraception, how to access methods, and knowledge about specific contraceptives. This exchange of information can both facilitate and discourage contraceptive use (D’Souza et al., 2022). Examples from Europe illustrate how contraceptive behavior can change through *social contagion*—when attitudes, ideas, and behaviors spread rapidly within a group. During recent “pill scares”, miscommunication about the safety of oral contraceptives led to widespread public concern about their risk in the United Kingdom, Norway, and the Netherlands in 1995, and in France in 2012 (Fuerdi, 1999; Bajos et al., 2014). Research on these events has found that in the short-term these scares prompted some women to switch contraceptive methods or discontinue use altogether, and that they also influenced healthcare practitioners’ prescribing practices (Le Guen et al., 2020); long-term effects of these scares remain unclear.

Social networks—including friends, family members, and peers—also play an important role in shaping contraceptive behavior (D’Souza et al., 2022). Although information about contraception can be transmitted through a variety of channels, available evidence highlights the particular importance of network influences. In a study of 22 high-fertility communities in Poland, Colleran and Mace (2015) found that the contraceptive behavior of friends and family was more influential

than women's individual characteristics in predicting whether they used any contraception. Further, they found that informal sources of information such as friends and community members had a stronger influence on contraceptive behavior than formal sources such as health centers (Colleran & Mace, 2015). Finally, social norms—which are generally accepted practices and behaviors maintained by shared beliefs and attitudes within a group—can substantially influence contraceptive behavior (Costenbader et al., 2017). One example is the role of religion in contraceptive use at both the individual and societal levels. Religions vary considerably in their views on contraception⁴, and the overall relationship between religion and contraceptive use remains unclear (D'Souza et al., 2022). However, existing evidence suggests that the influence of religion on contraceptive use extends beyond individual beliefs, as community-level religiosity has been found to relate to the contraceptive methods that women use (Colleran & Mace, 2015).

2.1.3.3. Healthcare Service Providers

At the frontline, healthcare service providers (HSP) are instrumental in providing both contraceptive information and access. One of the primary responsibilities of providers is facilitating contraceptive awareness, ensuring that patients are adequately informed on the available methods, the modality of use, the duration, and the possible side effects (Steiner et al., 2025). As a source of information, medical providers can affect contraceptive selection in a variety of ways, starting with the methods that they counsel on. Research has found that HSP tend to be less likely to counsel on or to recommend a long-acting contraceptive to some patients based on age and parity (Black et al., 2013; Buhling et al., 2014). For some providers, this can be the result of a lack of perceived interest from patients (Merki-Feld et al., 2018). In other instances, this can result from provider bias, which is considered to be preferences for specific contraceptives based on, “what’s ‘best’ for the client and/or easiest for the provider” (Sullivan et al., 2006, p. 503). While typically grounded in medical rationale, provider bias can ultimately, “result in a scientifically unjustifiable impediment to, or denial of, contraception” (Shelton & Angle, 1992, p. 1334). Taken together, HSPs can have a profound influence on the contraception that women use, and the extent of their impact can vary according to method type, as different contraceptives require varying degrees of HSP interaction for use.

⁴ See Genazzani et al. (2025) for an overview of how major religions view the use of contraception itself as well as their beliefs on certain types of contraceptive methods.

2.1.3.4. Healthcare Services

The accessibility of healthcare services can also affect contraceptive use in various ways. Accessibility can encompass the availability of contraception itself, the mode of access, the degree of confidentiality in service, and the associated costs ([European Parliamentary Forum for Sexual and Reproductive Rights \[EPF\], 2026](#)). Steiner and colleagues (2025) identify six causal pathways that healthcare systems facilitate contraceptive access: awareness, availability, accessibility, accommodation, acceptability, and affordability. Of the six dimensions of contraceptive access, one has yet to be addressed: affordability. The financial cost of contraception can be extremely influential on contraceptive behavior. Empirical evidence has found that cost can be a prohibitive factor in method selection, especially for long-acting methods ([Fiala & Parzer, 2019](#); [Kristensen & Lidegaard, 2021](#); [Sæbø & Skjeldestad, 2024](#)). There are several reasons that use of long-acting contraceptives can be particularly cost sensitive. The first of which is the additional service visits required, as starting use of a long-acting contraceptive requires consultations, healthcare provider assisted initiation, and in most cases, HSP assisted discontinuation ([Shelton & Angle, 1992](#)). Another reason is the cost of the method itself. Although long-acting contraceptives need to be replaced less often than short-acting contraceptives, most still require a substantially higher upfront cost at initiation ([Agostini et al., 2018](#); [Trussel et al., 2015](#)). The costs themselves are also highly dependable on the institutional regulations of the healthcare system, which affect what aspects of contraceptive access is reimbursed, and for whom ([EPF, 2026](#)).

2.1.3.5. Summary

Contraceptive use is influenced by more than individual preferences. Individual circumstances, social environments, healthcare providers, and healthcare systems all shape awareness of, access to, and use of different contraceptive methods. As a result, contraceptive use reflects both women's preferences and the opportunities and constraints present within the broader environment.

2.2. Fertility Preferences

From menarche to menopause—typically considered to be between ages 15 to 49—women are considered to be within their reproductive life. This period is marked by the potential ability to become pregnant and encompasses a wide range of reproductive decisions and experiences,

including family formation and childbearing. This section examines the reproductive life, focusing on theories of fertility preferences and related behavior, the formation and measurement of these preferences, and the factors that facilitate or constrain the realization of fertility preferences.

2.2.1. Theories on Fertility Preferences

A number of influential theories explain fertility and reproductive behavior as the outcome of purposeful decision-making. Although these approaches differ in the mechanisms they emphasize, they share the assumption that fertility is not merely a biological outcome, but largely a choice shaped by individuals' evaluations of the costs, benefits, and consequences of childbearing. The following theories illustrate how individual, familial, social, cultural, and economic factors are incorporated into models of fertility decision-making.

2.2.1.1. Quality-Quantity Model

In Becker's Quality-Quantity (1960) Model, fertility is conceptualized as the outcome of household decisions made under the constraints of time and economic resources. Parents are assumed to weigh the costs of having an additional child against other competing demands on their resources and to allocate those resources between the number of children they have and the investment made in each child. As household resources increase, the model predicts that parents will place a greater emphasis on investing in the education, health, and wellbeing of each child rather than increasing family size. Consequently, rising incomes and aspirations may contribute to lower fertility as parents seek to provide more resources to a smaller number of children.

2.2.1.2. Wealth Flows Theory

Caldwell's Wealth Flows Theory (1976; 2005) explains fertility as a result of the perceived costs and benefits associated with children. The theory argues that fertility is largely determined by the direction of intergenerational wealth flows, encompassing not only financial resources but also labor, care, status, and other forms of support exchanged between parents and children over the life course. According to Caldwell, these flows are shaped by the social organization of the family. In family systems where children are expected to contribute economically or provide support to parents, higher fertility is considered advantageous. Conversely, when parents are expected to invest substantial resources in their children, the perceived benefits of large families decline.

Caldwell further argues that the expansion of education and the increasing prominence of the nuclear family alter these intergenerational relationships, changing the incentives surrounding childbearing and contributing to lower desired fertility.

2.2.1.3. Value of Children Approach

The Value of Children (VOC) Approach by Hoffman and Hoffman (1973) focuses on how social and cultural contexts can affect fertility decision-making (Nauck, 2014). The VOC relies on two central assumptions. The first is the assumption that children fulfill a variety of economic, social, emotional, or normative needs for their parents. Fertility behavior is then considered to be based on the evaluation of these needs against the associated costs, barriers, and required resources for childbearing. The second assumption is that cultures and societies hold different values of children, and thus, they evaluate the need for fulfillment of children differently. Fertility preferences and the perceived value of children are therefore expected to vary between individuals, families, and societies.

2.2.1.4. Preference Theory

Hakim's Preference Theory (2000) argues that fertility and employment decisions are closely linked, and that in contemporary industrialized societies women's reproductive outcomes increasingly reflect their preferred balance between family life and paid employment. Hakim proposes that women differ systematically in their lifestyle orientations, ranging from family-centered to work-centered preferences, with many seeking to combine both roles. These preferences are expected to shape fertility preferences and behavior, contributing to variation in childbearing outcomes among women facing similar social and economic circumstances.

2.2.1.5. Life Course Approach

The Life Course Approach is a non-unified approach to understand how external and internal conditions shape behavior (Huinink & Kohli, 2014). Applied to fertility behavior, it recognizes that fertility and related decisions are embedded in both personal and social factors. The approach integrates aspects of other theories, maintaining that there is a value of childbearing in the subjective wellbeing of the parents (e.g., rational-actor models), and that the role of societal expectations and norms can be influential in fertility preferences and behavior (e.g., VOC Approach). What differentiates this approach is that it incorporates the transitional nature of the

life course into fertility preferences and behavior. The life course is recognized to provide both biological and societal constraints on fertility (Kohli & Meyer, 1986), which are responsive to life events and subsequently affect the desire for and timing of childbearing.

2.2.1.6. Summary

Although these theories differ in emphasis, they share the assumption that fertility behavior is shaped by more than biological capacity alone. Economic resources, social norms, cultural values, family relationships, and individual circumstances all influence fertility preferences and outcomes. Together, these frameworks provide a foundation for understanding how fertility preferences emerge and why individuals may differ in their reproductive behavior.

2.2.2. Differences in Fertility Preferences

Within academic literature, fertility preferences are conceptualized in different, and sometimes contrasting, ways. Briefly, this section reviews common types of fertility preferences and how they compare to one another.

2.2.2.1. Terminology

There are four main types of fertility preferences that are used in fertility research. Below, each is distinguished according to what aspect of fertility it is intended to represent and the common practice of how it is measured in surveys.

Fertility Ideals

When surveyed, fertility ideals intend to convey the societal norms of fertility, capturing either unconstrained personal or societal preferences. Personal fertility ideals are measured with questions such as: “*For you personally, what would be the ideal number of children you would like to have or would have liked to have had?*” and general ideals with: “*Generally speaking, what do you think is the ideal number of children for a family?*” (Generations and Gender Survey Round II [GGG-II], 2020). While surveyed fertility ideals are poor at capturing individual fertility preferences and behavior, they are believed to be strong indicators of societal attitudes toward family, childbearing, and the value of children (Sobotka & Beaujouan, 2014).

Fertility Expectations

Fertility expectations are, “beliefs regarding future states of the world, anchored in the past and actual conditions.” (Vignoli et al., 2020, p. 8). In surveys, fertility expectations are measured by questions such as: “*How many more children - including biological and adoptive children - do you intend to have overall? [Not including existing children]*” (GGS-II, 2020). Compared to other fertility preferences, expectations try to capture individuals’ assessments of their likely reproductive futures rather than their ideal outcomes or planned behavior. As a result, they are better suited to accommodate feelings of fertility uncertainty or ambivalence, as they do not imply a commitment to act in accordance with the stated preference (Özoruç et al., 2025).

Fertility Desires

Fertility desires—interchangeably referred to as preferences—refer to the unconstrained wants of fertility, whether past, present, or future. Surveys often distinguish fertility desires by asking about wants, such as: “*When do you want your next child?*” (Yeatman & Sennott, 2024, p. 3). Despite being conceptually distinct, fertility desires are often equated with fertility intentions in both survey measurement and analysis.

Fertility Intentions

As Iacovou and Tavares explain, “[fertility] desires may be thought of as unconstrained, whereas intentions incorporate factors such as an individual’s personal circumstances and perceptions of his or her partner’s desires” (2011, p. 89). In this sense, fertility desires are understood to be a component of fertility intentions, which themselves encompass a broader set of attitudes, beliefs, and contextual considerations (Fishbein & Ajzen, 1977). In survey measurement, fertility intentions are often targeted by questions such as: “*Do you intend to have a/another [biological] child during the next three years?*” (GGS-II, 2020).

While each of the presented fertility preferences are conceptually distinct, they are used inconsistently in literature (Fabic, 2022; Rodríguez et al., 2014). When possible, the remainder of this thesis will use the appropriate term for distinct preference types, however the term fertility preferences will be used when necessary to avoid confusion arising from inconsistent terminology or to refer to the broader concept of fertility preferences.

2.2.2.2. Flexibility and Strength of Fertility Preferences

When surveyed, attitudes toward fertility and potential pregnancy are often treated as a binary set of preferences: childbearing is either wanted or unwanted. Some scholars argue, however, that fertility preferences are better represented on a continuum (Higgins et al., 2012; Schwarz et al., 2007; Zabin, 1999). Fertility intentions have been found to adjust over a respondent's life course, reflecting the flexibility of intentions and their adjustment to different circumstances (Ray et al., 2018; Spéder & Kapitány, 2009). Research has also found that fertility intentions themselves can be fluid, with several studies finding that despite reporting a lack of pregnancy desire, many women would still consider an unexpected pregnancy acceptable and welcomed (Borrero et al., 2015; Gomez et al., 2018; Santelli et al., 2003). More broadly, fertility preferences can vary drastically in strength, with some women holding desires more strongly than others (Bernardi et al., 2014; Rocca et al., 2019). While some women are found to be ambivalent or uncertain toward childbearing, others can have strong fertility preferences (Bachrach & Morgan, 2013; Bhrolcháin & Beaujouan, 2018).

2.2.2.3. Timing of Fertility Preferences

Timing is an important component of fertility preferences, as it reflects both the strength and flexibility of the preference. Considerable research focuses on timing with respect to fertility intentions, as intentions incorporate both fertility desires and the constraints under which they are pursued. Fertility intentions are first considered within a binary, of whether or not future childbearing is intended. The intention to avoid childbearing is then disaggregated into three distinct motivations: the motivation for a specific birth interval following a previous birth (spacing), the motivation to postpone future childbearing for an unspecified period of time (postponement), and the motivation to limit one's number of children (stopping) (Timæus & Moultrie, 2008). Although theoretically distinct, disentangling these motivations can be complex. They are not strict nor fixed, as each is subject to, "a motivational continuum, rather than a sharp dichotomy, with considerable change along the continuum over time." (Cleland & Rustein, 1986, p. 85). Moreover, the measurement of these motivations can be sensitive to different life stages, as future fertility intentions are evaluated differently according to previous reproductive experiences (Guzzo & Hayford, 2020; Margolis & Myrskylä, 2015; Nelson et al., 2014; Umberson et al., 2010).

2.2.2.4. Summary

Fertility preferences are not a monolith; they vary according to several dimensions. Preferences can be distinguished into several different types, and each type can be differentiated according to flexibility, strength, and timing.

2.2.3. Determinants of Fertility Preferences

As discussed, certain fertility preferences are used to capture the nuance of both fertility desires and constraints. It is important to recognize, however, that all fertility preferences are to some degree subject to constraints, as beliefs, preferences, and desires are influenced by biological, societal, and environmental circumstances. Moreover, women face various costs associated with childbearing, affecting the perception of their ability to translate fertility preferences into realized fertility. This sub-section thus explores some of the prominent ways that fertility preferences are shaped and modified.

2.2.3.1. Individual Determinants

Studies have found evidence of both parity and age effects on individual fertility preferences. Research from Dey and Wasoff (2010) found that while parity was the decisive factor of fertility expectations in the early reproductive life, both parity and age affected expectations during middle reproductive ages. Further, irrespective of parity, parents were less likely to report future fertility expectations after age 35 (Dey & Wasoff, 2010). In another study, analyzing longitudinal data from Australia, Lazzari (2025) found evidence that infertility and the associated uncertainty results in a downward revision of fertility expectations, while fertility ideals are relatively unaffected. These findings are supported by other research which has found that family size intentions are revised downward across the reproductive life course, as individuals reevaluate the various opportunity costs of childbearing (Berrington & Pattaro, 2014; Liefbroer, 2009). Beyond parity and age, empirical evidence has found support of various correlates of fertility intentions, including individual attitudes and perceived behavioral control (Billari et al., 2009), current partnership status (Berrington & Pattaro, 2014; Sturm et al., 2023), and education level (Testa, 2014; Testa & Stephany, 2017).

2.2.3.2. Social Environment

Women's fertility preferences are partially informed by societal expectations of their fertility, providing a preconceived notion of how many children they should desire, and what ages it is acceptable to give birth (Billari et al., 2011; Bongaarts, 1982; Huinkink & Kohli, 2014). In Europe, there is considerable evidence of a persistent "two-child ideal" for families (Dey & Wasoff, 2010; Russo, 1976; Sobotka & Beaujouan, 2014; Toulemon et al., 2008). There is also evidence of societal norms for optimal childbearing ages, and that these norms have shifted in recent years to later ages of childbearing (Lazzari et al., 2025). These social norms can play a role in individual fertility expectations, although some findings suggest that they are more influential in the initial transition to parenthood than in higher-order parity progression (Billari et al., 2009). Fertility preferences are also shaped by gendered societal expectations. McDonald's (2000) Gender Revolution Theory argues that population fertility declines when advances in gender equality in education and employment are not matched by greater equality within the household. Women are therefore expected to succeed in the public sphere while continuing to bear primary responsibility for domestic work and caregiving. Empirical evidence supports this argument, finding positive associations between gender equity and fertility intentions at both the individual and national levels (Aragón-Morales & Ruiz-Jiménez, 2025; Bernardi et al., 2014; Leocádio et al., 2024; Neyer et al., 2013).

2.2.3.3. The Family Welfare Regimes

Institutional factors, particularly welfare regimes, also shape individual fertility preferences (Neyer, 2006). By influencing access to parental leave, childcare, employment protection, and income support, institutions affect both the norms surrounding motherhood and the opportunity costs of childbearing. More fundamentally, institutions influence preferences through their impact on the perceived uncertainty of parenthood (Adsera, 2011). Rindfuss and colleagues (2016) argue that among high-income countries, differences in institutional support for combining work and parenthood help explain the distinction between low- and ultra-low-fertility countries, with less supportive environments associated with lower fertility. Other researchers, however, find that the association between institutional support and fertility preferences is more complex. In comparative research between different European countries by Fahlén (2013) found that while there is some association between institutional support for work-family reconciliation and future fertility intentions, this relationship cannot be directly explained by variances in welfare regimes. These

findings are supported by research on familial welfare regimes and other dimensions of fertility—such as parity progression and fertility realization—which conclude that differences in regimes cannot fully account for observed differences between countries (Neyer, 2006; Bavel & Róžańska-Putek, 2010).

2.2.3.4. Summary

Fertility preferences are shaped by a complex interaction between individual preferences and the broader environments in which reproductive decisions occur. Reported fertility preferences reflect both women's attitudes and evaluation of potential pregnancy and future childbearing, but are also evaluated according to their individual, social, and institutional conditions.

2.3. Contraception as a Means of Enacting Fertility Preferences

In the preceding sections, the conceptualization and determinants of contraception and fertility preferences were presented. In this final section of the Theoretical Background, contraception will be explored as a potential means of enacting fertility preferences. First, demographic theories connecting the two will be presented. Then, recent trends in Europe will be shown for both contraception and fertility. Next, mechanisms of enacting fertility regulation through contraceptive use are explored. Finally, considerations in the link between fertility preferences and contraception will be discussed.

2.3.1. Theories on Fertility Regulation

This sub-section explores the various theories and frameworks used to explain contraceptive behavior in relation to fertility and fertility preferences. Here, the focus is on contraception more broadly—specifically, the decision of whether to use contraception at all.

2.3.1.1. The Ready-Willing-Able Model

Coale's (1973) Ready-Willing-Able (RWA) Model of fertility change posits that any change in fertility—and by extension, contraceptive use—is preceded by three societal conditions. The first precondition, Ready, is the recognition of the ability to exert control over fertility. To fulfill this, women must have a sense of autonomy over reproduction and must recognize that fertility itself is

adjustable. The second prerequisite, Willing, refers to the perception that there is a potential benefit to preventing or delaying pregnancy. These motivations are most commonly articulated by the rational-actor models of fertility (e.g., [Quality-Quantity Model](#); [Wealth Flows Theory](#)), which posit that individuals adjust their fertility in response to economic, social, or normative incentives. The final precondition, Able, refers to the knowledge and capacity to regulate fertility effectively. To act on fertility preferences, a woman must have access to sexual and reproductive health information and services; in the absence of such knowledge or means, preferences related to fertility cannot be translated into behavior.

2.3.1.2. Medial Motivations

The Medial Motivations Theory ([Timæus & Moultrie, 2008](#)) is an addendum to Bongaarts' Theory of the Proximate Determinants of Fertility (1978; 2015). Bongaarts had proposed that only four determinants—contraception, sexual exposure, abortion, and postpartum infecundity—could directly enact fertility change in a population. While background determinants—social, economic, and environmental factors—can also influence fertility, Bongaarts suggests that their effects are always moderated by changes in one or more of the proximate determinants. Moreover, Bongaarts' argued that while changes in background determinants *can* result in changes in fertility, changes in proximate determinants *will* result in changes in fertility. In their addendum, Timæus and Moultrie (2008) propose that there are “medial determinants” that moderate the relationship between the background and the proximate determinants. In short, they argue that fertility-regulation motivations determine how background determinants can influence proximate determinants. There are three proposed medial motivations, considered to be mutually exclusive and collectively exhaustive: fertility spacing, postponement, and limiting (referred to interchangeably as stopping). Each motivation is believed to be captured by two factors: a woman's desired parity and a woman's desired birth interval between her youngest child and a hypothetical future child. Together, these factors are proposed to determine contraceptive use, where of those open to future childbearing, women with a desired birth interval are considered spacers and women without are considered postponers.

2.3.1.3. Traits Desires Intentions Behavior (TDIB) Framework

The Traits Desires Intentions Behavior (TDIB) Framework ([Miller 1986; 1994](#)) is a fertility-specific adaptation of the Theory of Planned Behavior ([Ajzen, 1991; Ajzen & Klobas, 2013](#)), a

generalized psychosocial model. Both frameworks attempt to explain the processes underlying the translation of conscious intentions into behavior. They posit that intentions are determined by three factors—attitudes toward a behavior, social norms, and perceived behavioral control—and that these intentions are the immediate precursor to behavior. As a fertility-specific framework, the TDIB extends the TPB to explain reproductive decisions, suggesting that they are guided by three types of conception-oriented action types: trying to avoid conception, trying to conceive, and non-intervention. Each action type is considered to exist along a behavioral gradient, with contraceptive use and sexual behavior considered to be the main mechanisms used to enact reproductive intentions.

2.3.1.4. Cognitive-Social Model of Fertility Intentions

The Cognitive-Social Model of Fertility Intentions (CSM) ([Bachrach & Morgan, 2013](#)) proposes that fertility behavior results from a combination of both conscious and subconscious processes. Drawing from evidence in the cognitive and social sciences, the CSM models fertility behavior within the nexus of fertility intentions, social schemas, and structures⁵, allowing for various subconscious processes and environmental constraints to influence modelled behavior. In addition, the model argues that fertility intentions are not the direct predictor of fertility behavior. Instead, the CSM reasons that fertility-regulation intentions—which determine actions such as having sex, using contraception, and carrying a birth to term—have a more direct effect on fertility outcomes. While fertility intentions and fertility-regulation intentions can be aligned, they are ultimately informed by different schemas and structures and can therefore result in different fertility behaviors. As Bachrach and Morgan explain, this can translate into discrepancies between reported fertility-intentions and realized fertility: “There are many unintended pregnancies because there are many situations in which the dominant schemas and material structures are “not about” fertility. Pregnancy is the unanticipated consequence of actions aimed at other goals.” ([2013, pp. 478-479](#)).

2.3.1.5. Supply-Demand Framework of Fertility

Easterlin's Supply-Demand Framework of Fertility ([1975](#)) uses an economic approach to argue that fertility outcomes are shaped by the relationship between the demand for children, the

⁵ *Schemas* here refers to the concept within psychological sciences of: “A collection of basic knowledge about a concept or entity that serves as a guide to perception, interpretation, imagination, or problem solving.” ([American Psychological Association, 2018](#)), while *structures* are the configurations in which actions can occur.

potential supply of children, and the costs of fertility regulation. The model assumes that couples seek to achieve their desired family size and will only be motivated to limit fertility when the number of children expected to survive exceeds the number they desire. When this occurs, individuals may seek to regulate fertility through contraception or other means, provided that the economic, social, and psychological costs of fertility control are sufficiently low. Unlike other rational-actor models of fertility (e.g., [Quality-Quantity Model](#), [Wealth Flows Theory](#)), Easterlin specifies a distinction between fertility preferences and fertility-regulation preferences. While related, the desire for children and the willingness to use contraception are treated as analytically separate decisions, allowing the demand for contraception to be understood independently from the demand for children.

2.3.1.6. Contraceptive Confidence Hypothesis

In 1980 Keyfitz proposed the Contraceptive Confidence Hypothesis, which theorizes on the effect of contraceptive access on birth intervals. In short, the hypothesis proposes that given access to effective contraceptives, those who use effective methods will have shorter birth intervals than those using less effective contraception. Due to its higher efficacy, use of effective contraception is theorized to provide a higher degree of certainty to control fertility within a specific timeframe. Women with a higher sense of contraceptive security will thus restrict the timing of their childbearing, as they have less reason to be concerned about accidental pregnancy after fertility ideals have already been reached. According to Bhrolchaín (1988), the hypothesis has additional implications for the predicted relationship between women's employment and accessible contraception. Assuming the availability and accessibility of effective contraception, women will use their contraception to enable shorter birth intervals to ensure a quicker return to the labor force. However, this is dependent on the labor market opportunities available to women and the associated incentives to accelerate childbearing: when return to employment is inaccessible, women are less likely to contracept to ensure shorter birth intervals.

2.3.1.7. Summary

Altogether, the presented demographic theories on fertility regulation provide insight into some of the potential factors affecting the use of contraception. Each highlights the interrelated nature of the individual and their external environment, and how various considerations—individual, social, economic, or otherwise—could affect contraceptive use as a means of enacting fertility

preferences. Using this background, the next sub-section will use the Contraceptive Revolution and recent trends in fertility and family formation to explore in more depth how the sociocultural and environmental context can influence contraceptive use and fertility regulation.

2.3.2. Recent Trends in Fertility Regulation

This sub-section will present recent trends in fertility regulation, examining how fertility regulation has evolved in Europe since the introduction of modern contraceptives, and the related trends in fertility and family formation. Using the Contraceptive Revolution as an example, the different ways that the sociocultural and institutional environment can influence fertility regulation behavior will be illustrated. This sub-section will conclude by exploring the broader impacts of the Contraceptive Revolution and look at the potential implications for fertility regulation today.

2.3.2.1. The Contraceptive Revolution

Beginning in the 1960s, Europe underwent a major transformation in the individual and societal perceptions of women and fertility. One catalyst of these changes was the invention and diffusion of modern contraceptives, which drastically altered the accessibility and effectiveness of pregnancy prevention (Anderson & Johnston, 2023). Quickly, these improved methods—most notably the oral pill and the IUD—gained prominence in use, marking the beginning of the so-called “Contraceptive Revolution” (Westoff & Ryder, 1977). Coupled with the decriminalization of abortion (Frejka, 2008; Kuxhausen, 2020), and the emancipation of women under second-wave feminism (Shorter, 1973; Solsona, 1998), the Contraceptive Revolution resulted in women gaining greater autonomy and control over their fertility decisions (Caldwell, 1997), and relatedly, populations began experiencing considerable changes in family formation and partnership patterns (Dereuddre et al., 2016). However, the diffusion of modern contraception was not uniform across Europe. Today, while the Contraceptive Revolution can be considered “completed”—with modern contraceptives being the dominant type of contraception used—the progression to this state varied throughout the continent (Frejka, 2008). Two main paths emerged between Western and Eastern Europe during the Cold War. Changes during this time reflected the different social and structural realities, as changes “came initially in consequence of structural changes in social institutions... Yet later, birth control was carried through a momentum of its own via the mass media and the informal social network.” (Shorter, 1973, p. 612).

2.3.2.2. Modern Contraception: Northern and Western Europe

Prior to the Contraceptive Revolution, the social and institutional perspective on contraception and sexual and reproductive health in Western and Northern Europe varied. In some countries like the Netherlands, the Church had a significant influence in the legal restrictions on contraception and related services (Ketting, 1982), while in others such as the Nordic countries, government support for access to contraception was overt (Clark, 1976). By the early 1970's however, most Western and Northern European countries had legalized contraception and abortion (Kuxhausen, 2020; Régnier-Loillier et al., 2007), and even in the most conservative nations, methods such as the condom and pill were legally available, although marketed under different health benefits (Clark, 1976, p. 61). The spread of use of effective methods was not uniform within countries; birth control first spread among older more prosperous women, before being adopted by the masses (de Guibert-Lantoine & Leridon, 1999; Jacobsen et al., 1992; Shorter, 1973). However, by the completion of the Contraceptive Revolution in the 1970's, modern contraceptives were the dominant method of preventing pregnancy in Western and Northern Europe (Leridon, 1981; Torres & Jones, 1988).

2.3.2.3. Abortion: Central and Eastern Europe

In comparison to Western and Northern Europe, fertility regulation evolved quite differently over the course of the Contraceptive Revolution in Central and Eastern Europe (CEE), particularly within the Soviet Bloc. Although modern contraception became available around the same time, abortion and traditional contraceptive methods remained the primary means of fertility regulation (Kocourková, 2011). The “abortion culture” of CEE was the result of two main mechanisms (Stloukal, 1999). First, following the lead of the Soviet Union, abortion was legalized throughout the region in the 1950s (McIntosh, 1982). This contributed to its widespread accessibility and the sociocultural norm of using abortion as an “emergency birth control” in socialist countries (Sobotka, 2011). Another factor was the widespread distrust in modern contraceptives in CEE. Women reported fear of side effects and health risks of these methods due to a combination of mass media scares, provider bias, and informed risk assessment, as CEE birth control was known to have more side effects than Western versions (Kocourková, 2011; Stloukal, 1999). Even when some CEE governments began restricting abortion access and promoting modern contraceptives, abortion rates continued to persist (McIntosh, 1982). It was only after the fall of the Iron Curtain that abortion rates began to fall, and the use of modern contraception became widespread. Scholars

point to several mechanisms of this shift in fertility regulation in CEE: the withdrawal of free or subsidized abortion and contraception (Kocourková, 2011; Shiffman et al., 2002), a reduction in family-friendly policies (Macura & MacDonald, 2003), and a wider cultural shift toward adopting Western attitudes of family formation and fertility (Rabušic, 2001; Thornton & Philipov, 2009). By the 2000s, abortion rates had declined dramatically, and modern contraception became the predominant means of fertility regulation in most of Central and Eastern Europe, marking the completion of the Contraceptive Revolution (Kocourková, 2011; Sobotka, 2011).

2.3.2.4. Case Study: Germany

Briefly, Germany warrants additional discussion, given the country's divide into East and West between 1949 until 1990. Both countries followed somewhat untraditional trajectories in fertility regulation compared to their regional counterparts. In West Germany, although modern contraception was the most commonly used form of pregnancy prevention (Oddens et al., 1994), usage rates of traditional methods were still considerably higher than in other Western and Northern European countries (Riphagen & Ketting, 1990). In contrast, East Germany did not follow the "typical" socialist model of contraception, as rates of modern contraceptive use and abortion were much more similar to those observed in Northwestern Europe (Oddens et al., 1994). Taken together, there is support for examining contemporary contraceptive use in Germany in comparison to Western and Northern European countries, although some caution should be exercised (Dereuddre, 2017).

2.3.2.5. The Completion of the Contraceptive Revolution

Despite unique trajectories in different regions, Europe today is considered to have completed its Contraceptive Revolution, with modern contraceptives being the dominant method type used throughout (Frejka, 2008; Klijzing, 2000). Perhaps one of the more understated effects of this Revolution is the role that it played in changing the societal understanding of fertility regulation. As summarized by Leridon: "In effect, a new era of contraceptive practice has been ushered in, with the adoption of methods that are permanent in nature and totally dissociated from the sexual act. With the adoption of these methods, childbearing becomes a fully voluntary act, resulting from the decision to interrupt contraceptive practice that was started before marriage or at the time of marriage; it is no longer an unplanned event that is simply expected to happen sometime during the first years of marriage." (1981, p. 78). In other words, the newfound effectiveness and

reliability of contraception transformed how women viewed both childbearing and fertility regulation, enabling the decision to enter motherhood and to progress to a higher parity to become a choice (Rabušić, 2001; van de Kaa, 1997) .

2.3.2.6. Fertility Today

The transformation of fertility regulation and contraceptive use brought about by the Contraceptive Revolution has been accompanied by profound changes in fertility and family behavior across Europe. Numerous theories have been proposed to explain these developments. The most influential is the Second Demographic Transition Theory (Lesthaeghe, 2020; Lesthaeghe & van de Kaa, 1986; van de Kaa, 2003), however other notable theories include the Gender Revolution Theory (McDonald, 2000), the Globalization Theory (Blossfield et al., 2005), and the Developmental Paradigm (Thornton, 2001). Despite their differences, these perspectives broadly agree that the emergence of modern contraception were fundamental in recent demographic change. Today, contemporary fertility patterns in Europe are characterized by delayed childbearing, persistent sub-replacement fertility, and a discrepancy between intended and realized fertility. Women are having children at increasingly older ages, with mean ages at first birth converging across Europe near age 30 (Human Fertility Database, 2026). Although delayed childbearing does not necessarily result in permanently lower fertility, it increases the likelihood that intended births remain unrealized due to the shortening of the reproductive window (Huinkink & Kohli, 2014). While postponed first births are often recuperated at older ages, recuperation of second- and higher-order births has been found to vary considerably across European countries (Frejka, 2011; Sobotka, 2011). At the same time, despite persistently low fertility rates, fertility ideals have remained close to replacement level, producing the so-called “fertility gap” (Bongaarts, 2001; Sobotka & Beaujouan, 2014). Studies point to a combination of biological, economic, and social constraints as contributors to this discrepancy (Harknett & Hartnett, 2014; Lazzari & Beaujouan, 2026; Liefbroer, 2009; Philipov, 2009).

2.3.2.7. Summary

In the context of the Contraceptive Revolution and recent trends in fertility, contemporary contraceptive use is generally understood as a conscious choice, reflecting women’s preferences, constraints, and wider environment. While the preceding sub-section presented population

patterns, the subsequent will explore the link between fertility preferences and contraceptive use at the individual-level.

2.3.3. Enacting Fertility Regulation

This sub-section explores the mechanisms in which contraception can be used to enact fertility preferences. First, use is discussed more generally, before presenting method-specific selection according to different fertility-related motivations for contraceptive use.

2.3.3.1. Contraceptive Use

In many ways, the motivation to use contraception can be considered within a binary: the desire to avoid pregnancy, or not. Although this assumption is over-simplified at the individual-level, it is generally supported when examining contraceptive use within a population with numerous studies finding fertility preferences to be strongly correlated with contraceptive use (e.g., [Dereuddre et al., 2016](#); [Leridon, 1981](#); [Passet-Wittig & Lück, 2025](#); [Skouby, 2004](#); [Testa, 2012](#)). As described earlier, within the desire to avoid pregnancy there are suggested to be three distinct fertility-related motivations for contraceptive use: the desire to space, postpone, or stop childbearing ([Timæus & Moultrie, 2008](#)). Available evidence broadly supports the notion that women and couples practice fertility regulation according to these motivations. In one of the first studies to examine this, Sagi and colleagues ([1962](#)) found evidence that American couples practiced more effective contraceptive behavior once their desired family size had been achieved, with the primary mechanism being more effective use of their current contraception. These findings support the argument that contraceptive behavior can be modified in response to achieving the desired family size, even in the absence of modern contraception, as the data used was from 1956, which was prior to the introduction of the modern oral pill or IUD ([Sagi et al., 1962](#)). Most modern studies, however, study the association between fertility regulation and preferences not just by analyzing contraceptive use itself, but by examining the specific contraceptive methods used.

2.3.3.2. Method Use

Translated into method use, different contraceptives are conducive of different medial motivations. As a reminder, contraception varies along several dimensions, including effectiveness, duration of

use, and additional effects such as side effects and health benefits. Arguably, the most important factors regarding the different fertility regulation motivations are effectiveness and duration of use. Fertility spacing, considered to be a desire to have a specific birth interval, is best supported by short-acting methods, as they are shorter in duration and more easily reversible (Yeatman & Sennott, 2024). In comparison, fertility postponement and stopping are best supported by long-acting methods, as they are the most effective at preventing pregnancy (Leridon, 1981, p. 77). One exception to these links between different fertility preferences and regulation motivations is among women who are childless. While childless women can undoubtedly use contraception to space or stop childbearing, the majority—particularly at younger ages—likely use contraception primarily as a means of postponing fertility (Timæus & Moultrie, 2008, pp. 505–506). In this case, the choice of different contraceptive methods is less likely to reflect a specific medial motivation; for this reason, Timæus and Moultrie (2008) exclude this subgroup from their theory.

There is a large body of research that supports the ideas that women use different methods of contraception according to their fertility preferences. The majority of this research is inferential, where women's reported fertility preferences are not factored for, and instead preferences are assumed according to women's age and parity. In an early cross-national study of contraceptive use in Europe, Leridon (1981) found that the oral pill, a short-acting contraceptive, was overwhelmingly used among the youngest age group, while the IUD, a long-acting contraceptive, was more often used among older women. This age-specific usage pattern has continued to be observed across Europe up until today (Congy et al., 2024; Guibert-Lantoine & Landon, 1999; Kristensen & Lidegaard, 2021; Skouby, 2004). In some studies, this pattern has been extended to parity, with long-acting contraceptive use found to be more likely among women who have already had two or more children (Bajos et al., 2012; Eeckhaut et al., 2014; Ruiz-Muñoz & Pérez, 2013; Skjeldstad, 1994). In one of the only longitudinal studies on contraceptive use in Europe, Lindh and colleagues (2010) found that among women in Gothenburg, Sweden, women were more likely to use short-acting contraception at the beginning of their reproductive careers while long-acting contraception was favored during the middle- and late reproductive years.

While there is a clear association between parity, age, and the use of different types of contraception, it can be difficult to disentangle the effects. Existing evidence of this relationship

is primarily observational, resulting in the joint association between parity and age on contraceptive use being unclear. This also limits to the extent to which the effects of parity can be ascertained, with particularly ambiguity surrounding parity-differentials in contraceptive use among women who have already begun childbearing. Moreover, most studies do not explicitly account for fertility preferences when examining how different methods of contraception are used according to different reproductive life stages and instead infer fertility-regulation motivations from observational markers such as parity and age.

2.3.3.3. Summary

Contraceptive use is observed to vary across the reproductive life, with nulliparous younger women tending to use short-acting contraception and primiparous older women more likely to use long-acting contraception. This suggests that women may use different contraceptive methods according to the stage of their reproductive career. However, this association is largely influential, as available evidence is primarily descriptive.

2.3.4. Considerations in Enacting Fertility Preferences

Available evidence indicates an association between fertility regulation and fertility preferences, with women believed to contracept according to their medial motivations for pregnancy. This relationship intrinsically rests on three assumptions: that fertility intentions determine contraceptive behavior; that women face identical consequences of pregnancy; and that contraceptive use is the product of a conscious choice. The following sub-section will review these assumptions, focusing specifically on their implications in respect to fertility spacing, postponement, and stopping.

2.3.4.1. Assumption 1: Fertility Intentions Determine Contraceptive Behavior

Several theories of fertility suggest that fertility intentions are the predecessor to fertility regulation behavior (e.g., [Medial Motivations Theory](#), [TDIB Framework](#), [Contraceptive Confidence Hypothesis](#), [Quality-Quantity Model](#), [Wealth Flows Theory](#)). Other theories, however, differentiate fertility intentions from fertility-regulation intentions, arguing that contraceptive behavior is the product of fertility-regulation intentions (e.g., [Cognitive-Social Model](#), [Supply-Demand Framework](#)). In contraceptive studies, there is a growing movement to adopt the position

of the latter. Perhaps the largest disapproval raised is that in assuming fertility intentions determine contraceptive behavior, the desire to avoid pregnancy is equated with the desire to use contraception (Karra, 2022; Senderowicz, 2020; Zabin, 1999). This equivalency then necessitates several additional assumptions about contraceptive behavior that are considered to be oversimplistic and unrealistic, as contraceptive methods can be chosen based on various considerations, some of which are unrelated to the risk of pregnancy⁶.

2.3.4.2. Assumption 2: Women Face Identical Consequences of Pregnancy

Preferences for both fertility and fertility regulation are affected by a shared set of beliefs regarding the likelihood and implications of potential pregnancy, as the accompanying side effects and risks of pregnancy (D'Souza et al., 2022, p. 369). As women differ in their perceptions of pregnancy and motherhood, they may also differ in their contraceptive behavior. One important distinction is between women who have not yet had children and those who have already entered parenthood. For the latter, contraceptive decisions are made in the context of progression to higher-order births, whereas for childless women they are made in the context of the transition to motherhood. These represent distinct life-course stages that cannot be treated as equivalent (Hobcraft & Kiernan, 1997; Margolis & Myrskylä, 2015; Nelson et al., 2014; Timæus & Moultrie, 2008; Umberson et al., 2010). Moreover, the determinants of childbearing may vary across reproductive events, as “the conditions and context in which any one contraceptive decision, conception, or birth occurs are almost certainly linked to prior and subsequent reproductive experience” (Guzzo & Hayford, 2020, p. 129).

2.3.4.3. Assumption 3: Contraceptive Use is the Product of a Conscious Choice

An underlying assumption of the Medial Motivations Theory is that contraceptive use is the product of deliberate decision-making (Timæus & Moultrie, 2008). While this assumption is consistent with some theories of fertility (e.g., the TDIB Framework and rational-actor models), it contrasts with approaches that recognize the role of both conscious intentions and more automatic, non-deliberate cognitions in shaping behavior (e.g., the Cognitive-Social Model). Nevertheless, the assumption may be more plausible for some contraceptive methods than others. In particular,

⁶ The details of these criticisms are outside the scope of this thesis; for a more thorough review, see Senderowicz and Maloney (2022).

long-acting methods are likely to reflect conscious choice to a greater extent than short-acting methods. Whereas short-acting methods can be discontinued at any time, long-acting methods generally require interaction with a healthcare provider both to initiate and discontinue use. Reasonably, these additional barriers suggest that compared to other contraceptive methods, long-acting contraception is more likely to reflect conscious decision-making.

2.3.4.4. Summary

While there is strong evidence to indicate a relationship between fertility preferences and contraceptive use, it is important to exercise caution in attribution. Although the corresponding behavioral outcomes of fertility preferences and fertility-regulation intentions can overlap, they are not equivalent. Further, women face different consequences of pregnancy—particularly between the childless and parents—and cannot be assumed to evaluate these consequences in the same way. Finally, the decision to use different contraceptive methods varies, and not all method types can reasonably reflect a conscious choice; of the methods, use of long-acting contraception is the most likely to reflect conscious decision-making.

3. EMPIRICAL BACKGROUND

Informed by the Theoretical Framework, the focus of this analysis is on long-acting contraceptive use and its potential use as a means of enacting fertility stopping. As such, this chapter will present the relevant empirical evidence for the analysis, concentrating on long-acting contraceptive use among women of reproductive age who have already transitioned into motherhood. Although parity is considered to be the main explanatory variable of interest, long-acting contraceptive use will also be examined with respect to other individual and environmental determinants of use. [Section 3.1](#) will pay particular attention to long-acting contraceptive use across the reproductive life course and related variables. [Section 3.2](#) will then present the institutional considerations of long-acting contraceptive use, focusing on the respective contraceptive and family welfare regimes.

3.1. Long-Acting Contraceptive Use

The following section will present an empirical overview of long-acting contraceptive use, presenting evidence predominantly from the European region. Patterns of use in relation to the reproductive life course will be presented, followed by additional factors of use.

3.1.1. A Re-Introduction

Briefly, it is important to reintroduce long-acting contraception and how it is differentiated from other methods of contraception. Contraceptive method types are considered here to be within a dichotomy of either short-acting or long-acting. While short-acting contraceptives can be discontinued at any point in use by the user, long-acting contraception is considered to be any method where discontinuation cannot be practiced independently by the user, if at all. Beyond permeance and associated duration, the two method types differ in effectiveness, with long-acting contraception considered to be more effective due to the lack of user interference in efficacy ([Bearak et al., 2020](#)). Notably, both contraceptive method types include both hormonal and non-hormonal options. Common examples of long-acting contraceptives include the intrauterine device (IUD), male and female sterilization, the injection, and the implant. Importantly, under this definition of long-acting contraception both reversible and permanent methods are included, as both are conducive of fertility stopping. When presenting empirical findings that are specific to

reversible methods the term LARC will be used, while long-acting contraception will be adopted when the findings are generalizable to both reversible and permanent methods.

3.1.2. Use Across Measures of the Reproductive Life

As demonstrated in the Theoretical Background, it is beneficial to study contraceptive use from a life course approach, as the selection of different methods varies according to individual experiences and changes in circumstances (Huinink & Kohli, 2014; Swiatlo et al., 2023). The following sub-section will present long-acting contraceptive use under two main considerations: parity and age, and fertility intentions.

3.1.2.1. Parity and Age

By and large, the most common observation of the use of long-acting contraception in Europe is the higher usage rates among women who are older and have more children. These trends have been consistent for several decades and have been observed across different European countries and regions (Eeckhaut et al., 2014; Hognert et al., 2017; Kristensen & Lidegaard, 2021; Leridon, 1981; Lindh et al., 2017; Régnier-Loillier et al., 2007; Ruiz-Muñoz & Pérez, 2013; Skjeldstad, 1994; Skouby, 2004). Some scholars have gone on to attribute this relationship to long-acting contraception being used as a means of achieving fertility stopping, recognizing the tendency for nulliparous and primiparous women to prefer short-acting contraceptives (Bajos et al., 2012; Congy et al., 2024; Guilbert-Lantoine & Landon, 1999; Haimovich, 2009). Perhaps one of the earliest scholars to argue this was Leridon (1981). Regarding a study of twelve countries from the European Fertility Survey of 1974 to 1978, Leridon concluded: “Overall, these findings lend credence to the belief that couples use the most effective methods of contraception more frequently to end childbearing than to space births.” (1981, p. 77). Despite widespread promotion of this idea, existing evidence is primarily inferential, with fertility regulation motivations inferred from observational markers such as parity and age rather without directly incorporating measures of fertility preferences.

3.1.2.2. Fertility Intentions

While there is a clear association between age, parity, and the use of long-acting contraception, few studies have directly incorporated the variability of the reproductive life course or fertility preferences when measuring this association. One notable exception is work by Gray and

McDonald (2010), who used different indicators of the reproductive life course—parity, age, and fertility intentions—to examine patterns of contraceptive use according to method permanency among Australian women. They found that method selection varied across reproductive life stages, with women at the end of childbearing significantly more likely to use long-acting contraceptive methods. Although age predicted contraceptive method type, parity and fertility intentions were the strongest predictors of long-acting contraceptive use. Consistent with previous research, women with two or more children were found to be significantly more likely to use a long-acting method than nulliparous women. Interestingly, they also found no discernable difference in long-acting contraceptive use between women with one child as opposed to no children, and they found that regardless of parity, women who did not intend to have additional children were significantly more likely to use long-acting contraception than women who intended future childbearing. These findings have two implications: they support the proposition that contraceptive use does not follow strictly age-based trajectories, and these findings offer evidence supporting arguments that long-acting contraceptives are often used as a means of achieving fertility stopping. Gray and McDonald go on to conclude that, “While LARC⁷ methods could be considered a suitable method of postponing fertility, the pattern of use did not suggest that LARC methods were being used to postpone childbearing; instead the emphasis is not on when women plan to have their children but whether or not they plan to have children in the future.” (2010, p. 54).

3.1.2.3. Summary

Long-acting contraceptive use varies according to stages of the reproductive life, with many studies highlighting the importance of parity and age. Studies additionally incorporating fertility intentions are limited but have supported the theory that long-acting contraceptive use is used to enact motivations of fertility stopping.

3.1.3. Additional Factors of Use

In addition to reproductive life course markers, use of long-acting contraception is also subject to additional considerations, two of which are explored here: postpartum status and socioeconomic status. Importantly, while only these two factors are presented, they are by no means considered

⁷ To avoid confusion and maintain consistency with terminology, the original wording of “medium-term” methods—referring to the IUD and implant—was adjusted to LARC.

to be exhaustive of the individual determinants of long-acting contraceptive use. Other factors can include current partnership status (Firman et al., 2018), social networks (Colleran & Mace, 2015; D'Souza et al., 2022), and the experience of perimenopause or menopause (Genazzani et al., 2025; Whitburn et al., 2025).

3.1.3.1. Postpartum Status

Long-acting contraceptive use among mothers is likely to vary depending on whether a woman is postpartum, and the proximity to her most recent birth event. Following the end of pregnancy, fertility can return within one to six months, dependent on breastfeeding practices (Glassier et al., 2019). Despite this, studies have found that there is limited antenatal contraception counselling or provision provided in Europe (Sedlecky et al., 2020), particularly for the provision of long-acting contraceptive methods (Cooper et al., 2024, p. 242). For women who are breastfeeding, guidelines on contraceptive use are conflicting and unclear (Kapp & Curtis, 2010). While some long-acting methods such as the injection have unknown health effects on the infant, others such as the IUD are known to be safe, but to have lower rates of effectiveness in the weeks immediately following birth (Glassier et al., 2019). Consequently, although studies show that many women are interested in postpartum contraception and pregnancy spacing, women report that they are uncertain about best practices in respect to the postpartum period (Freeman-Spratt et al., 2023). There is also some evidence of parity-specific differences in contraceptive use postpartum. One study from Denmark found that women of a higher parity were more likely to use a long-acting contraceptive method postpartum than women of parity one (Larsen et al., 2025). This finding aligns with evidence that the intention to postpone the next birth increases with parity (Bühler & Philipov, 2005).

3.1.3.2. Socioeconomic Status

Compared to other contraceptive methods, women of lower socio-economic background are more likely to face barriers of access to long-acting contraception. From a financial standpoint, long-acting contraception is considerably more expensive than short-acting methods due to the cost of the contraceptive itself, the additional healthcare service visits required, and whether or not it is reimbursed under national healthcare schemes (Agostini et al., 2018; Shelton & Angle, 1992; Trussel et al., 2015). Generally-speaking, women of lower education have been found to choose contraceptive methods according to economic cost (Buhr & Castiglioni, 2017), and both qualitative and quantitative studies have found costs are a barrier to use of long-acting

contraceptives (Fiala & Parzer, 2019; Furu et al., 2021; Gaiswinkler et al., 2024; Kristensen & Lidegaard, 2021; Sæbø & Skjeldestad, 2024). Women may also face differences in access to and utilization of long-acting contraception according to their socioeconomic status. In France, women who consult a gynecologist for contraceptive care are more likely to use long-acting contraception than those who rely on a general practitioner, while gynecologist use is itself more common among women in higher-level occupations (Bajos et al., 2012). Moreover, women facing financial difficulties and women of migrant background are more likely to be prescribed certain long-acting contraceptives in France, a pattern that is suggested to partially reflect healthcare provider bias regarding contraceptive adherence (Bajos et al., 2012).

3.1.3.3. Summary

Beyond stages of the reproductive life course, use of long-acting contraception can be affected by factors such as postpartum status and socioeconomic status. Both are subject to barriers to use that are specific to long-acting contraception.

3.2. Long-Acting Contraceptive Use: National Considerations

Both fertility preferences and regulation are subject to the wider institutional context. Women's contraceptive choices are shaped by the availability of different methods, sociocultural norms surrounding their use, and social and institutional expectations of motherhood, which influence how women evaluate fertility regulation and the risk of pregnancy. The following section will explore national and regional differences along both paradigms, presenting the respective contraceptive and family welfare regimes.

3.2.1. Contraceptive Regimes

As discussed in [Section 2.1.3](#), contraceptive behavior is in part determined by the accessibility of contraception. From a macro perspective, this can be considered the contraceptive regime, which is comprised of various dimensions, including institutional support and access, current use and method mix, and sociocultural norms.

3.2.1.1. Institutional Support and Access

According to the European Parliamentary Forum's [EPF] Contraceptive Policy Atlas (2026), there is wide variation in contraceptive access throughout Europe. The EPF's Atlas ranks countries according to measures of contraceptive access as determined by laws and regulation, access to methods, and available information. In 2026, Western Europe (WE) leads in contraceptive access compared to other regions, with the primary distinguisher being financial remuneration. Every country in the WE region offers some form of financial coverage for contraceptives under the national health system, special coverage for vulnerable groups (youth and low-income), and coverage of at least one type of long-acting contraception (EPF, 2026). Using a 100-point scale, WE countries average a ranking of 91% contraceptive access; in comparison, the next highest ranked region is the Nordic countries, ranked at 69%. Compared to the WE countries, the main difference in contraceptive access is that in the Nordic countries there is less financial coverage available, both generally, and for vulnerable groups. The Nordic countries are then followed by the German-speaking and Central European countries, which rank at 62% and 52% respectively. Most countries in the two regions have no coverage of contraception under the national health system and no reimbursement for any form of long-acting contraception (EPF, 2026).

3.2.1.2. Current Use and Method Mix

Comparable data on contraceptive use in Europe is generally limited, however, with estimates from Haakenstad and colleagues (2022), contraceptive use and method mix can be compared at the sub-regional and national-levels. In 2019, they estimate that among the European regions, the Nordic countries have the highest average contraceptive prevalence rate (CPR), with 80.2% of women aged 15 to 49 reporting use. They are followed by the Western European and German-speaking countries, who report CPRs of 72.5% and 75.6% respectively, and the Central European countries with an estimated CPR of 52.3%. Throughout Europe, short-acting methods tend to be the preferred contraceptive method type, with approximately 66.3–71.3% of women using this method type as their contraception in most regions. Central Europe can be considered an outlier, as the estimated use of short-acting methods is much higher at 83.6%, and correspondingly, the estimated long-acting method use is much lower than in other regions. Among long-acting methods, there appears to be substantial variation in method choice across European countries and regions. Generally, the IUD is the most common long-acting contraceptive method used, with regional rate usage rates ranging from 7.6% in Central Europe to 16.7% in the Nordic countries,

with the exception of the Netherlands, where male sterilization is more common. In most European countries, female sterilization appears to be more common than male sterilization, with approximately 5.6–7.6% of women of reproductive age who use contraception relying on female sterilization in most countries. There are some exceptions—in Croatia female sterilization rates are quite low (1.6%) while in Germany rates are much higher (11.9%). Other long-acting methods such as the injection and the implant are less commonly used in most countries, with usage rates for both contraceptives estimated around 1.2–4% throughout the European regions (Haakenstad et al., 2022).

3.2.1.3. Societal and Healthcare Norms

One important sociocultural factor in contraceptive use is the role of religion in society, and it can determine institutional access to contraception and related reproductive health services. Women in countries with strong ties to the Roman Catholic church are likely to face additional barriers to long-acting contraceptive use, as along with all “artificial” contraceptive methods, its use is considered immoral (Genazzani et al., 2025). In countries such as Austria, with a population that is predominantly Catholic, this is seen in the increasing political opposition to aspects of sexual and reproductive health, including abortion rights and sex education (Limacher et al., 2023). In other countries like Croatia, which is considered one of the most religious countries in Central and Southeastern Europe (Ančić & Zrinščak, 2012), the role of Catholicism has been steadily increasing since the fall of communism, and religion has become a marker of national identity (Grozdanov & Zelič, 2023, p. 160). As a result of increasing traditional and religious pressures, legal accessibility to contraception, abortion, and other services in Croatia has become increasingly more restricted (Grozdanov & Zelič, 2023; Shiffman et al., 2002). In both countries, long-acting contraceptive use is estimated to be slightly lower than regional averages (Haakenstad et al., 2022). This is in contrast to countries such as the Czech Republic—which is an “atheist or non-believing country” (Sekerák & Rosůlek, 2023, p. 174)—where contraceptive access has been increasing in recent years (Kocourková & Fait, 2011; EFP Atlas, 2026). Contrasting to other post-Soviet states with higher levels of religious affiliation, the Czech Republic experienced a much more rapid increase in modern contraceptive use in the 1990s (Idlbeková & Kocourková, 2026) and today is estimated to have much higher rates of long-acting contraceptive use than the CEE average (Haakenstad et al., 2022).

Beyond religion, evidence from some European countries suggests that healthcare providers also play an important role in shaping patterns of long-acting contraceptive use. In the Netherlands and Denmark, there has been a particular increase in use of long-acting contraception among young women, which has been partially attributed to changes in national guidelines on contraception and the increased recommendation by healthcare practitioners (Kristensen & Lidegaard, 2021, Marra et al., 2020). Yet, recent qualitative analysis from the Nordic countries reveals that available information on contraception might be insufficient for some women. In Denmark, contraceptive information provided from governmental, NGO, and commercial sources were all found to promote normative assumptions of contraceptive use, such as women bearing the responsibility for contraception (Nørgaard & Jepsen, 2023). In Norway, it was found that the prevailing sociocultural norm of modern contraceptive use could be a barrier to contraceptive accessibility. Women reported that they, “experienced little acceptance for using or considering non-hormonal contraceptive methods” and that there was “no room” for discussing non-hormonal methods with their healthcare practitioners (Lukasse et al., 2021, p. 4). Women’s desire for information on non-hormonal contraception in Norway mirrors reports from the German-speaking region, where there is an increasingly critical attitude toward hormonal contraceptives and a corresponding decrease in the use of modern contraceptives over recent years (Dereuddre, 2017; Scharmanski & Hessling, 2024; Tschudin, 2021).

3.2.1.4. Summary

There is wide variation in the contraceptive regimes across Europe. Generally, the Western European and Nordic countries appear to have the most supportive environments for contraceptive access, although findings indicate some barriers to method choice. The German-speaking countries and Central European countries have comparatively less access to contraception, as demonstrated in both related regulation and current method mix.

3.2.2. Family and Welfare Regimes

Given differences in sociocultural and institutional contexts, fertility preferences and fertility regulation behavior are unlikely to be uniform across countries. Decisions regarding childbearing and contraception are shaped by the opportunity costs associated with parenthood, which are influenced by factors such as the availability of parental leave, the flexibility and security of part-

time work, access to childcare, and prevailing norms surrounding motherhood and the gendered division of labor (Karra & Wilde, 2024). These factors affect both the perceived costs of parity progression and the extent to which women are able to reconcile employment and family life, with implications for fertility preferences and associated contraceptive use.

3.2.2.1. Reconciliation of Work and Family

One influential factor in fertility preferences and the motivations for fertility regulation is the institutional support offered to reconcile the compatibility of work and family. In Social Democratic Welfare states such as Denmark and Norway (Esping-Andersen, 1999; Gautier, 2002), there is strong institutional support to promote gender equality, corresponding to generous parental leave policies and extensive provisions for public childcare support (Ellingsæter & Leira, 2006; Hellstrand et al., 2021). This results in women generally taking a longer maternal leave, followed by high usage of childcare services for young children, as the majority of women re-enter the labor market following childbirth (Lewis et al., 2008; Spitzer et al., 2022). In comparison, France, which has a more conservative regime (Esping-Andersen, 1999; Gautier, 2002), offers shorter parental leave than the Nordic countries, but similarly high levels of childcare support, resulting in mothers quickly re-entering the labor force (Toulemon et al., 2008; Wood et al., 2014), although the progression to parity two has been found to be associated with a reduction in employment rates (Lewis et al., 2008). In countries with more traditional welfare states, women are typically extended less institutional support for employment and motherhood (Esping-Andersen, 1999; Gautier, 2002). In Croatia for example, there is a two-breadwinner model, characterized by high levels of female labor market participation (Baturina et al., 2011). Combined with limited childcare services and a more normative gender division of childrearing (Grozdanov & Zelič, 2023), the ability for women to reconcile both motherhood and employment expectations is challenging (Frejka et al., 2016). Similarly, in the Czech Republic, women face complete withdrawal from the labor market following childbirth due to employer discrimination against mothers and potential mothers, and a lack of available childcare. This creates a de-facto male breadwinner model, as women bear the primary responsibility of childrearing (Frejka et al., 2016).

3.2.2.2. Norms of Motherhood

Women's contraceptive method choice, and their perception of the risk of pregnancy and parity progression, is also dependent on the sociocultural norms of motherhood (Liefbroer & Billari, 2010). The propensity to use long-acting contraception as a means of fertility postponement or stopping is likely to be affected by the ability for women to reconcile the social expectations of their role in the family and in the workforce (McDonald, 2000). In Central European countries such as Croatia and the Czech Republic, more traditional expectations of the gendered division of household labor and an increase in less favorable family policies after the fall of the Iron Curtain has made it difficult for women to balance the responsibilities of both motherhood and employment (Frejka et al., 2016; Macura & MacDonald, 2003). Combined with the effects of rising female education (Rabušic, 2001), countries like the Czech Republic have seen a decrease in parity progression in recent cohorts (Frejka et al., 2016). This contrasts with the Netherlands, where there is strong institutional support for motherhood norms. The country is characterized by a strong sociocultural preference for at least one of the biological parents to care for children, preferably the mother (Mills & Täht, 2010), and has implemented wide sweeping legislation to enable women to sustain part-time work, allowing women to participate in the workforce while adhering to sociocultural norms (Mills, 2015; van Nimwegen et al., 2002). In comparison, in Germany and Austria, there is a "traditional" social view on motherhood, with a normative gender division of childbearing responsibilities (Sobotka, 2011). As a result, it is normal for women to work only part-time as a way to reconcile childbearing responsibilities, and in the progression to parity two women are found to experience a reduction in overall employment rates (Lewis et al., 2008). Correspondingly, both countries are characterized by a relatively high share of childlessness, and a very low share of women with more than two children (Bujard & Sulak, 2016).

3.2.2.3. Summary

European countries differ greatly in the social and institutional expectations of motherhood. Generally, the Western and Nordic European countries are more supportive of the reconciliation of work and family, while women in the German-speaking and Central European countries face higher opportunity costs to childbearing.

4. CONCEPTUAL FRAMEWORK

Building on the Theoretical and Empirical Backgrounds, this Chapter presents the study at hand and the associated analytical framework. First, [Section 4.1](#) briefly reviews the theoretical and empirical underpinnings of the research. Then, [Sections 4.2](#) and [4.3](#) define the primary and secondary research questions, the related key constructs, and the associated hypotheses.

4.1. Motivation

This thesis studies contraceptive use among women who are currently using contraception, focusing specifically on the use of long-acting contraception. This is considered to be any contraceptive where discontinuation cannot be practiced independently by the user, encompassing both reversible methods (LARC) and irreversible methods. Because of the duration of use and the limited reliance on user action, long-acting contraceptives are considered to be the most effective contraceptive type at preventing pregnancy ([Bearak et al., 2020](#); [Merki-Feld et al., 2018](#)). Previous studies have observed that there are differentials in usage rates of long-acting contraception across Europe, with women of both higher parity and older age more commonly reporting use ([Kristensen & Lidegaard, 2021](#); [Skjeldstad, 1994](#)). The prevailing explanation is that women adopt long-acting contraceptives as a means of fertility stopping once their desired family size has been reached ([Bajos et al., 2012](#); [Gray & McDonald, 2010](#); [Haimovich, 2009](#); [Guibert-Lantoine & Leridon, 1999](#)). Yet, despite the importance of parity to this explanation, parity differences in long-acting contraceptive use have rarely been examined beyond descriptive comparisons. As a result, the extent to which long-acting contraceptive use reflects fertility stopping behavior remains unclear.

4.2. Primary Research Question

4.2.1. Key Constructs

The primary research question is therefore interested in analyzing the use of long-acting contraception and its association with parity as well as other influential demographic factors. Aligned with previous literature, the main motivation of contraceptive use is assumed to be pregnancy prevention. Accordingly, long-acting contraceptive use is analyzed relative to all other contraceptive methods, representing the range of options available to women who choose and are able to practice pregnancy prevention. Given that the transition to parenthood is demographically

distinct from progression to higher-order parities (Hobcraft & Kiernan, 1997; Timæus & Moultrie, 2008), this study focuses exclusively on women who have had at least one biological child. The population of interest therefore comprises parous women of reproductive age who are not currently pregnant.

Additional assumptions are necessary in order to maintain the assumption that contraceptive use is primarily motivated by pregnancy prevention. To plausibly assume the risk of pregnancy, traditional measures of contraceptive use—such as the Unmet Need for Family Planning—restrict the population according to marital status or recent sexual exposure (Bradley et al., 2012; UN DESA, 2022). This approach, however, has been shown to result in measurement error (Bradley & Casterline, 2014), and has been widely criticized for the reductionist approach to pregnancy risk (Fabic, 2022; Fabic & Becker, 2017; Karra, 2022; Rodríguez et al., 2014; Rominski & Stephenson, 2019; Senderowicz, 2020; Senderowicz & Maloney, 2022). In light of these criticisms, this thesis adopts the assumption that all women are exposed to the risk of pregnancy and accordingly presumes that all women have exposure to (heterosexual), sex and that both partners are fecund. Additionally, while traditional measures of contraception exclude postpartum women from calculations—again, to assume risk of pregnancy—here they are included in the population of interest, as it has been shown that postpartum women can be at risk of pregnancy almost immediately after childbirth (Glassier et al., 2019). However, to account for possible differences in contraceptive use according to postpartum status, the time since recent birth event is included as a control variable in the analysis. Furthermore, gives possible variations in contraceptive access due to socioeconomic status (Bajos et al., 2012), highest educational level achieved is additionally used as a control variable.

4.2.2. Primary Research Question & Hypotheses

Using the outlined key constructs, the primary research question is as follows:

RQ1 Among parous women, is parity associated with the use of long-acting contraceptive methods and, if so, does this association vary by reproductive age and by country?

Two hypotheses guide this analysis in answering the primary research question:

H1 Compared with women of parity one, women of parity two or higher are expected to have a greater likelihood of using a long-acting contraceptive method, and to exhibit less cross-national variation in long-acting contraceptive use.

H2 The association between parity and long-acting contraceptive use is expected to vary across reproductive age, with parity differences diminishing during the later reproductive years.

The first hypothesis is based on the assumption that long-acting contraceptives are more supportive of fertility stopping behavior than other methods of contraception due to higher rates of effectiveness, longer duration, and independence from user management (Bearak et al., 2020). Additionally, it is informed by existing evidence on long-acting contraceptive use, which consistently finds multiparous women to have the highest likelihood of using these methods (e.g., Hognert et al., 2017; Kristensen & Lidegaard, 2021; Leridon, 1981; Régnier-Loillier et al., 2007). Given limited national or regional research on contraceptive use in Europe, the differences in long-acting contraceptive use across the countries of study is unclear. However, any cross-national differences are likely to vary by parity, given the persistence of a two-child ideal in Europe (Russo, 1976; Sobotka & Beaujouan, 2014) and recent declines in higher-order births (Zeman et al., 2018). Women of parity two are therefore considered comparatively unlikely to experience an additional birth relative to women of parity one. As such, fertility preferences among primiparous women are expected to be less definitive and more contingent on future circumstances, resulting in fertility regulation behavior that is more sensitive to institutional context. Consequently, women of parity one are expected to exhibit greater cross-national variation in long-acting contraceptive use than women of parity two or more.

The second hypothesis is based on evidence from previous studies emphasizing the importance of both parity and age in contraceptive behavior (Eeckhaut et al., 2014; Lind et al., 2010; Ruiz-Muñoz & Pérez, 2013). As the joint association between parity and age has been examined minimally, the expected effects in the early and middle reproductive years are uncertain. However, given both theories and evidence of biological and social constraints of fertility during later reproductive years (e.g., Life Course Approach), there is reason to expect that the effect of parity on long-acting

contraceptive use will diminish across these ages, or approximately 40 to 49 (Billari et al., 2007; Billari et al., 2011; Bongaarts, 1982; Huinink & Kohli, 2014).

4.3. Secondary Research Question

4.3.1. Key Constructs

The primary research question studies the association between long-acting contraceptive use and parity, age, and country. Previous studies, however, have also emphasized the strong association between fertility intentions and contraceptive use (Dereuddre et al., 2016; Lindh et al., 2010; Skouby, 2004). As fertility intentions are themselves related to parity, age, and country-specific institutional contexts (Bühler & Philipov, 2005; Dey & Wasoff, 2010; Neyer, 2006), observed differences in long-acting contraceptive use by parity may partly reflect differences in reproductive intentions. To assess this possibility, the original population of interest is restricted to only include women of the same fertility intention. Based on the assumption that contraception is primarily used for pregnancy prevention, the restricted sample is thus composed of women from the baseline sample who report no short-term fertility intention.

4.3.2. Secondary Research Question and Hypothesis

The secondary research question and related hypothesis are as follows:

RQ2 How do the associations between parity and long-acting contraceptive use differ when the analysis is restricted to women reporting no short-term fertility intentions?

H3 The association between parity and long-acting contraceptive use is expected to persist among women reporting no short-term fertility intentions, although parity differences are expected to be smaller than those observed in the baseline sample.

The third hypothesis is based in part on the Medial Motivations Theory, which argues that contraception is used for either birth spacing, postponement, or stopping (Timæus & Moultrie, 2008). To this end, fertility intentions are theorized to be associated with contraceptive use, a finding which has been supported by empirical evidence (Dereuddre et al., 2016; Lindh et al., 2010; Skouby, 2004). While the Medial Motivations Theory does not directly hypothesize on how

this relationship varies according to different contraceptive methods, it is once again assumed that long-acting contraceptives are more supportive of fertility stopping behavior than other methods. Consequently, some of the parity differences observed in the baseline sample may reflect differences in short-term fertility intentions. However, the Cognitive-Social Model distinguishes fertility intentions from fertility-regulation intentions, arguing that the latter are more directly linked to contraceptive behavior ([Bachrach & Morgan, 2013](#)). As a result, fertility intentions are not expected to fully account for parity differences in long-acting contraceptive use, which are therefore expected to persist among women reporting no short-term fertility intentions.

5. DATA AND METHODS

5.1. Data and Sample

5.1.1. Generations and Gender Survey Round II

This analysis used data from the Generations and Gender Program Survey Round II (GGS-II) Wave I, which is a panel survey aimed at collecting international data on life course and family dynamics. The GGS-II data was selected for its accessibility⁸, reliability, and its emphasis on cross-national comparability (Gauthier et al., 2025). Given the overall strength of the survey design, estimates of contraceptive use derived from GGS-II data are expected to be reliable (Cleland et al., 2004). While there are slight variations between each country due to independent survey administration and collection, the differences are believed to be negligible given the identical baseline questionnaire (Mercarini et al., 2025).

Table 1: Information on the datasets and final sample, including year of data collection, sample size, and the proportion reporting use of a long-acting contraceptive.						
Code	Country	Year	Total (<i>N</i>)	Parity 1	Parity 2+	LA Users
<i>Nordic countries</i>						
DK	Denmark	2021	1,488	328	1,160	51.2%
NO	Norway	2020	736	132	604	55.3%
<i>Central European countries</i>						
HR	Croatia	2023	761	225	536	19.1%
CZ	Czech Republic	2020-22	964	197	767	27.5%
<i>German-speaking countries</i>						
AT	Austria	2022-23	986	295	691	41.7%
DE	Germany	2021-22	2,208	631	1,577	19.0%
<i>Western European countries</i>						
FR	France	2023-24	1,318	312	1,006	53.5%
NL	The Netherlands	2022-23	1,058	231	827	42.2%
LA is long-acting contraception: <i>intrauterine device (IUD)</i> , <i>implant</i> , <i>injectable</i> , <i>(male, female) sterilization</i> .						
Final sample consists of women aged 25–49 who report use of any method of contraception; sample size is reported after deleting respondents with values missing on the (in)dependent variables.						
Source: GGS Round II Wave 1 country-specific technical documents.						

⁸ All data is freely available online to researchers upon successful registration and application through the Generations and Gender Program online platform: <http://www.ggp-i.org>

5.1.2. Sample Selection

For this analysis, the sample consisted of all women aged 25 to 49 with at least one biological child who report using contraception and who do not report themselves or a partner being pregnant. This age range is chosen to maximize the available sample size, as recent estimates of the Mean Age at Birth ranges between 30.42–31.9 in the selected countries ([Human Fertility Database, 2026](#)). Respondents who indicated a pregnancy were omitted from analysis to maintain the assumption that the immediate motivation for use of any contraceptive method is pregnancy prevention. Country selection consisted of all European GGS-II participating countries where responses on contraceptive methods were considered complete. Incomplete response types included only the partial collection of methods (Belarus, Latvia), no specific methods collected (Sweden), and no dedicated response to indicate “no contraception” being used (Estonia, Finland, Moldova, United Kingdom). To obtain reliable results, countries were then assessed for missingness and sample size following complete case analysis; details on the missingness assessment are available in [Appendix Section 9.2](#).

The final sample was comprised of respondents from eight European countries. Four groupings were represented: Nordic countries (Denmark, Norway), Central European countries (Croatia, Czechia), German-speaking countries (Austria, Germany), and Western European countries (France, Netherlands). An overview of the final sample is available in Table 1; a more detailed review is available in [Appendix Table B](#).

5.2. Variables of Analysis

This section provides a review of the variables used in analysis; a table of all GGS-II used is reported in [Appendix Table C](#).

5.2.1. Dependent Variable

In the GGS-II, contraceptive use is captured for all respondents who are not pregnant and younger than age 50. Respondents were asked, “Are you or your partner using or doing any of these things to prevent pregnancy at this time?” ([GGS-II, 2020](#)) and were able to indicate as many as fourteen different contraceptive methods used. While the majority of contraceptive values captured adhere to the baseline questionnaire, there are patterned country-specific deviations, particularly

regarding reporting of “other” or “no method”. These values were recoded for congruency; original values are reported in [Appendix Table D](#).

Following Koops (2023), each respondent was then assigned one contraceptive value corresponding to the most effective method they reported using. Using the summary from Polis et al. (2026), effectiveness was measured according to typical use among women and defined as: “the percentage of users becoming pregnant during the first year of contraceptive use” (p.2). Notably, a response of “other” contraception being used was classified as having a higher effectiveness than “no method” but as a lower effectiveness than all known types. The guiding assumption here was that any contraceptive used will be more effective at reducing risk of pregnancy than no contraception used.

Table 2: All contraceptive methods captured in the GGS Round II Wave I, according to method type, effectiveness, and key characteristics of use.					
Method Type	Contraceptive Method	Effectiveness ^(a)	Episodic ^(b)	Duration ^(c)	Discontinuation
Short-acting	Condom (Male)	13.0%	E	—	User Dependent
	Condom (Female)	21.0%	E	—	User Dependent
	Diaphragm/Cervical Cap	17.0%–22.0%	E	—	User Dependent
	Foam/Cream/Jelly	21.0%	E	—	User Dependent
	Oral Pill	7.0%	NE	Daily	User Dependent
	Persona	12.0%	NE	Daily	User Dependent
	Withdrawal	20.0%	E	—	User Dependent
	Rhythm	15.0%	E	—	User Dependent
	Vaginal Ring	7.0%	NE	3 Weeks	User Dependent
Long-acting	Implant	0.1%	NE	3–5 Years	Practitioner Dependent
	Injectable	4.0%	NE	1–3 Months	Time Dependent
	IUD	0.4%–0.8%	NE	7–12 Years	Practitioner Dependent
	Female Sterilization	0.5%	NE	Lifelong	Not Possible
	Male Sterilization	0.2%	NE	Lifelong	Not Possible
Other	None of the Above	—	—	—	—
	Other Method	—	—	—	—
	“Plan B”	—	—	—	—
(a) Effectiveness: Measured according to typical use in the United States, the “percentage of users experiencing an unintended pregnancy within the first year of contraceptive use” (Polis et al., 2026, p. 2). (b) E: Episodic (coitus dependent), NE: Non-Episodic (coitus independent). (c) Duration: Measured as the length of time that the method can reliably prevent pregnancy (Festin et al., 2016). <i>Sources:</i> Average duration of use (WHO/SRH, 2022); contraceptive effectiveness (Polis et al., 2026; Urrutia & Polis, 2023).					

As this analysis is focused on contraceptive type by duration, respondents were then further categorized into distinct groups of contraceptive types based on typology by Festin et al. (2016). The typology and characteristics of the collected contraception methods are provided in [Table 2](#),

with more details available in [Appendix Table E](#). All respondents who reported use of any contraceptive method were categorized as using either long-acting, short-acting, or other methods of contraception. Contrary to the convention of differentiating reversible and permanent contraceptives (e.g., LARC), long-acting contraception was defined as all methods where discontinuation cannot be practiced independently by the user, regardless of permanency, as both types of believed to be conduce of fertility stopping⁹.

5.2.2. Independent Variables

For this analysis, parity was derived from provided birth history information from respondents, where women were grouped based on their biological parity as being of *Parity 1*, or *Parity 2+*. To ensure accuracy, respondents with partial or implausible birth history information were removed from the sample. Each respondent's age was calculated in years, ranging from ages 25 to 49. Using the birth history and age information, *birth event* was created as a control variable, calculated as the number of months since the most recent birth event of the respondent. Additionally, *highest educational level* was controlled for according to the nine-point ISCED scale captured in GGS-II.

The final section of this analysis restricts the original sample to only women who indicate no short-term intention of childbearing. All women under age 50 were asked in the GGS-II: “Do you intend to have a/another [biological] child during the next three years?” ([GGS-II, 2020](#)), with responses measured on a five-point Likert scale from “definitely not” to “definitely yes.” Accordingly, the sub-sample is restricted to women who reported either “probably not” or “definitely not” in Section 6.3 of the analysis¹⁰.

5.3. Analytical Strategy

To test the hypotheses, this analysis used multivariate logistic regressions for each country, where the dependent variable is the contraceptive method types: long-acting, short-acting, and other.

⁹ Additionally, analysis was run measuring contraception according to four distinct types: short-acting, long-acting, permanent, and other. The results yielded were similar, however the reduction in sample size resulted in larger standard errors and wider confidence intervals.

¹⁰ Additionally, analysis of the restricted sample was run to include only respondents who reported their intention to have a child in the next 3 years as “definitely not”. The results yielded were relatively similar, however the reduction in sample size resulted in larger standard errors and wider confidence intervals.

While all three method types are modelled, only long-acting contraception is considered an outcome of interest. The other two contraceptive types are included so that modelled values of long-acting contraception use can be interpreted within the full range of possible contraceptives. The primary independent variables are parity and age; the time elapsed since the most recent birth event, and the highest educational level are used as control variables to account for differences that may arise due to postpartum status or socioeconomic status. Formally, the model can be understood as:

$$Eq.1 \quad \log\left(\frac{Y_{i=k}}{P(Contraceptive=LA)}\right) = \beta_0 + f(Age_i \times Parity_i) + \beta_1 Parity_i + \beta_2 birth_i + \beta_3 edu_i$$

where:

$$Eq.2 \quad f(Age_i) = Age_i + Age_i^2$$

To allow for non-linear patterns, *Age* is modelled as continuous and squared. *Parity* is included as a binary variable indicating the number of biological children a woman has (1, or 2+), with the reference category being women with two or more children. The main logistic regressions include an interaction effect between *Age* and *Parity* to additionally explore the potential moderating effect of age on parity. Both time since the most recent event (*birth*) and highest level of education achieved (*edu*) are modelled as continuous.

Throughout the paper, "baseline sample" is used to refer to the complete study sample after applying the baseline inclusion criteria, while "restricted sample" refers to the subset obtained after additional restricting for fertility intentions. The majority of the analysis is fit on the baseline sample of respondents. In the final section, however, each model is refit to a sub-sample of respondents in order to investigate whether the results are artefact of differing underlying fertility intentions between the two parity groups. Accordingly, the secondary sample consists only of respondents who indicated no fertility intention within the next three years.

6. RESULTS

This Chapter presents the descriptive results ([Section 6.1](#)) and results from the multivariate analysis, both without accounting for ([Section 6.2](#)) and with accounting for fertility intentions ([Section 6.3](#)). Multivariate results are presented by country as average marginal effects (AMEs), predicted probabilities, and differences in probability. Comparisons between countries is done only descriptively, as each model is fit on a unique sample.

6.1. Results from the Descriptive Analysis

[Table 3](#) presents the distribution of respondents reporting use of long-acting contraception across countries, parity, and age groups; for the distribution of use of short-acting and other contraceptives see [Appendix Tables F–G](#). The numbers should be interpreted with some caution, as the number of respondents across parity and age groups are not distributed equally. Across the countries of study, the share of respondents who use a long-acting contraceptive appears to vary by both parity and age, with some country- and region-specific variations.

Overall, the descriptive results align with the expectation that women with a higher parity are more likely to use long-acting contraceptive methods. This difference is generally more prominent at younger ages than at older ages, with the share of users becoming more similar between the two parity groups above age 40. There are some exceptions, most notably being Austria, where there is a fluctuation in the share of long-acting users at later ages, particularly among women of parity two or more. Based on the share of users in each age group, it appears that the convergence between parity groups is primarily driven by an increase in use among women of parity one at older ages. Across countries, however, the distribution of use of long-acting methods does not appear to vary uniformly by age. In the Central European countries, the share of women of parity one using long-acting methods is extremely low below the age of 40, while in the Nordic and Western European countries long-acting contraceptives appear to be used more commonly at the younger ages than in other countries. Among women with two or more children, the onset of increased use in long-acting contraceptives appears to occur at younger ages than for women with only one child. In some countries—such as Croatia, Germany, and France—this increased share of use among multiparous women appears to be more gradual, while in others—such as the Czech Republic,

Austria, and the Netherlands—it appears to jump sharply. Altogether, the descriptive results align with the expectation that women of a higher parity are more likely to use long-acting contraceptives than those of parity one, with this association varying at different reproductive ages and in different country and regional contexts.

Table 3: Proportion of women using long-acting contraception among women reporting any contraceptive use, by country, parity, and age.

Age		Parity 1		Parity 2+		Age		Parity 1		Parity 2+	
		%	N	%	N			%	N	%	N
Nordic countries											
DK	25–29	34.8	69	46.8	47	NO	25–29	26.7	30	63.6	22
	30–34	26.2	103	47.7	172		30–34	30.8	39	47.9	96
	35–39	24.6	61	54.1	266		35–39	22.6	31	51.0	143
	40–44	31.2	48	56.9	304		40–44	68.8	16	64.5	172
	45–49	44.7	47	64.4	371		45–49	68.8	16	66.7	171
	$\bar{x}$	31.1	328	56.9	1,160		$\bar{x}$	37.1	132	59.3	604
Central European countries											
HR	25–29	8.1	37	21.4	28	CZ	25–29	0.0	33	8.0	25
	30–34	1.9	52	24.6	118		30–34	1.9	54	7.8	64
	35–39	4.8	42	26.6	199		35–39	4.3	46	21.6	139
	40–44	19.4	36	32.7	223		40–44	10.2	59	26.1	161
	45–49	36.7	30	40.2	199		45–49	33.3	33	31.3	147
	$\bar{x}$	12.2	197	31.4	767		$\bar{x}$	8.9	225	23.3	536
German-speaking countries											
AT	25–29	8.9	45	28.6	28	DE	25–29	10.9	64	15.9	44
	30–34	20.0	65	33.7	101		30–34	8.1	161	12.3	212
	35–39	20.3	64	50.8	181		35–39	20.1	139	16.5	400
	40–44	37.0	54	45.8	179		40–44	16.4	152	21.8	524
	45–49	34.3	67	60.4	202		45–49	21.7	115	27.5	397
	$\bar{x}$	24.7	295	48.9	691		$\bar{x}$	15.5	631	20.4	1,577
Western European countries											
FR	25–29	43.4	53	48.8	41	NL	25–29	17.9	39	19.0	21
	30–34	33.3	84	53.7	147		30–34	29.0	69	41.5	142
	35–39	40.6	64	56.3	277		35–39	24.1	54	45.3	225
	40–44	50.8	59	59.0	300		40–44	26.7	30	45.7	243
	45–49	46.2	52	58.9	241		45–49	43.6	39	53.6	196
	$\bar{x}$	42.0	312	57.1	1,006		$\bar{x}$	28.1	231	46.1	827

Baseline sample. Percentages are calculated among women reporting any contraceptive use. The denominator includes long-acting, short-acting, and other contraceptive methods.

Source: GGS Round II Wave I; own calculations.

6.2. Results from the Multivariate Analysis

Informed by observations in the descriptive analysis, this section uses results from the multivariate analysis to further explore the association between parity and the use of long-acting contraceptives

and how that association may vary by reproductive age and country. Model results are available in [Appendix Tables J–K](#).

6.2.1. Use of Long-Acting Contraception by Parity: Average Marginal Effects

Results of the logistic models are first reported as Average Marginal Effects (AMEs) presented in [Table 4](#). Here, AMEs represent the averaged difference in probability of using long-acting contraceptives by parity given that the values of the covariates (age, birth event, and highest education achieved) remain at their observed levels. Overall, the results find parity to have a significant association with use of a long-acting contraceptive method, with women of parity two or more modelled more likely to use long-acting methods across all countries of analysis. The size of the effect appears to differ significantly across countries, with only a 4 percentage point difference in use predicted between women of differing parities in Germany, in contrast to a 30.5 percentage point difference predicted in Denmark. The AMEs indicate no strong regional trends in the association between parity and the use of long-acting contraceptives, although groupings may later emerge upon the inclusion of age. The wide confidence intervals in some countries (Austria, France, the Netherlands, Norway) further support the possibility that there is an age effect that interacts with parity, which is not yet accounted for in the presented AMEs.

6.2.2. Use of Long-Acting Contraception by Parity: Incorporating Age

In this sub-section, the baseline model specification is used to obtain the predicted probability and the difference in probability of women using a long-acting method of contraception compared to a short-acting or other method. Two groups of women who already have children are compared across different reproductive ages: women with one child and women with two or more. Results are presented in [Figures 1A–8B](#), with two types of graphs for each country. Figures with suffix A display the conditional predicted probability of using a long-acting contraceptive for women of parity one and parity two or more; figures with suffix B display the difference in probability of use of a long-acting contraceptive between the two parity groups. All probabilities are presented at the mean time elapsed since the most recent birth event and the mean level of education within each country. Additionally, the model specification includes an interaction effect between parity and age to further explore the variation of the effect of parity. Results first explore the general interaction between parity and age on the probability of use of a long-acting contraceptive, followed by a comparative analysis of how this interaction varies between parity groups of

different reproductive ages. Due to comparatively smaller sample sizes of the oldest ages, high levels of uncertainty are observed in some countries above age 45, limiting interpretation.

Table 4: Average marginal effects (AMEs) of parity on using a long-acting contraceptive method among contraceptive users.			
Country	Parity (ref: 1)	95% Confidence Interval	
<i>Nordic countries</i>			
Denmark	0.305***	0.217	0.394
Norway	0.153**	0.042	0.265
<i>Central European countries</i>			
Croatia	0.083***	0.041	0.126
Czech Republic	0.173***	0.114	0.232
<i>German-speaking countries</i>			
Austria	0.248**	0.096	0.401
Germany	0.040*	0.007	0.073
<i>Western European countries</i>			
France	0.152***	0.073	0.230
The Netherlands	0.094	-0.088	0.275
Baseline sample. AMEs represent differences in the predicted probability of using a long-acting (vs. short-acting or other) method for women of parity 2+ relative to parity 1.			
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.00$.			
Age is modelled here as a squared and continuous variable.			
Source: GGS Round II Wave I; own calculations.			

6.2.2.1. Parity-Specific Probabilities of Use Across Reproductive Age

Figures with suffix A display the conditional predicted probability of using a long-acting contraceptive for women of parity one (green) and parity two or more (blue), with 95% confidence intervals shown every five years. Overall, the results find that the association between parity and the use of long-acting contraception persists once additionally modelling for reproductive age, with women of parity two or more modelled to have a higher probability of use from ages 25 to 49. Between countries, however, parity-specific trends vary significantly across reproductive age. Among women of parity one, the pattern of the probability of using long-acting methods is found to vary somewhat similarly within country groupings—increasing across age (Central European), decreasing (Western European), following somewhat of a u-shape (Nordic), and an inverted u-shaped (German-speaking). Regional similarities are less pronounced, however, among women of parity two or more. Instead, probabilities follow a gradual decline or inverted u-shape pattern in most countries, with only Germany and Norway deviating (an increase and a u-shaped pattern, respectively). In combination, the unique patterns of predicted use for each parity produces several

distinct trends of parity differentials across reproductive age, which are explored in the following sub-section.

6.2.2.2. Parity Differentials in the Probability of Use Across Reproductive Age

Figures with suffix B display the difference in probability of use of a long-acting contraceptive between the two parity groups, and their respective confidence intervals. In these graphs, confidence intervals that lie outside of the value zero indicate that the respective group has a significantly higher probability of use than the other group, while values within zero indicate the difference between parities is statistically insignificant. Here, parity one serves as the reference group, meaning that positive values indicate that parity two or more has a higher probability of use while negative values indicate that parity one has a higher probability of use. Altogether, the results show a non-linear association between the use of a long-acting contraceptive, parity, and age. However, the difference between parities at different reproductive ages varies significantly, with countries falling into three general patterns that are detailed below.

6.2.2.3. Pattern 1

In *Pattern 1*, the difference in the probability of use between parity one and parity two or more is represented by an inverted u-shape pattern and is followed by four countries—Croatia, Denmark, France, and the Netherlands. At the youngest measured age (25), there is only a very small—and in most cases statistically insignificant—difference in the probability of women of parity two or more using a long-acting contraceptive compared to women of parity one. This difference is larger at older reproductive ages, with the maximum difference found between ages 36 to 39. In three of the countries this corresponds to a 16 to 19.7 percentage point higher probability of women of parity two or more using a long-acting contraceptive than women of parity one; in Denmark the difference is substantially larger at 30.3 percentage points. Following the local maxima, the difference in probability between parities becomes smaller at older reproductive ages, and by age 49, differentials substantially return to the probabilities observed at age 25. In Denmark, France, and the Netherlands, the shape of the predicted change is relatively symmetrical, with similar slopes observed as differences both increase and decrease across age (Figures 1B, 7–8B). In Croatia, however, the difference in probability of long-acting contraceptive use decreases at a much quicker rate, becoming insignificant at age 45 (Figure 3B). Across *Pattern 1*, the variation in parity differentials at various ages appears to emerge from unique underlying patterns. In France

and the Netherlands, the inverted u-shape is the result of a simultaneous increasing use of long-acting methods by higher-order parity women and slight decrease in use by primiparous women during mid-reproductive ages (Figures 7–8A). This contrasts with Denmark—where the inverted u-shape is primarily driven by a large decrease in use among women of parity one (Figure 1A)—and Croatia—where use increases for both parity groups, albeit at a faster rate for women of parity two or more (Figure 3A).

6.2.2.4. Pattern 2

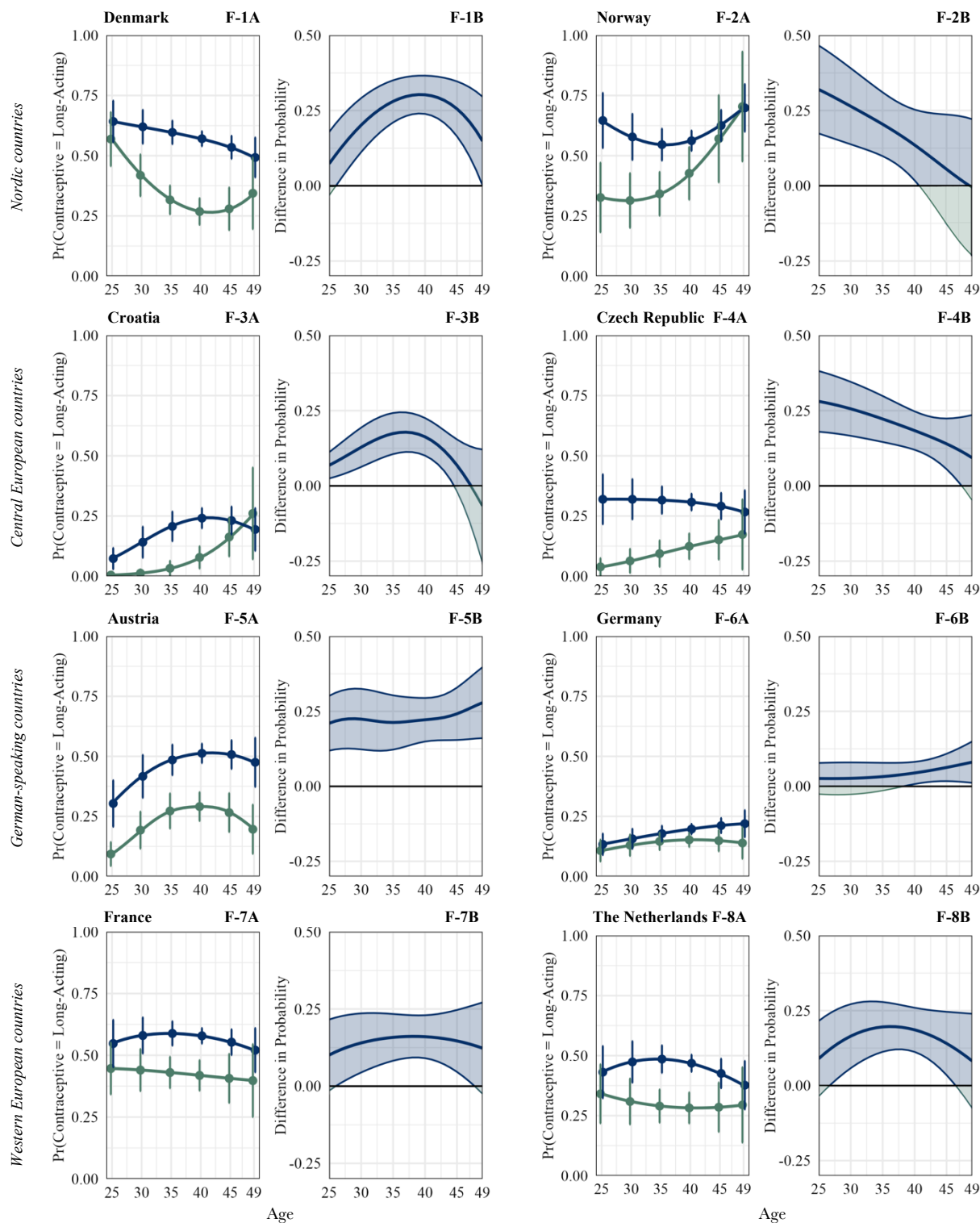
The second pattern in the parity-differentials in the use of long-acting contraceptives across age is represented by a downward sloping line, with the highest differential found at the youngest measured age. Two countries follow *Pattern 2*—the Czech Republic and Norway. In both countries there is a relatively high difference in the probability of using long-acting contraception between women of parity two or more and women of parity one at age 25, with women of higher parity being 28 and 32 percentage points more likely to be users (Czech Republic and Norway, respectively). The difference in use between the two parity groups then diminishes at older reproductive ages, becoming insignificant at age 41 in Norway (Figure 2B) and age 48 in the Czech Republic (Figure 4B). In contrast to *Pattern 1*, both *Pattern 2* countries produce their pattern from more or less the same underlying mechanisms. The downward sloping probability emerges here as a result of a substantial increase in long-acting contraceptive use among women of parity one, compared to more moderate changes in use among women parity two or more (Figures 2A, 4A).

6.2.2.5. Pattern 3

The final pattern, *Pattern 3*, is characterized by a relatively flat line that slightly increases from youngest to oldest ages in the difference in probability between the parity groups of using long-acting contraceptives. Both of the German-speaking countries, Austria and Germany, follow *Pattern 3*, although the countries meaningfully vary otherwise. Austria exhibits a relatively high differential between the parity groups at all measured ages, with women of parity two or more 21 percentage points more likely to use a long-acting method at age 25, and 27.9 percentage points more likely at age 49 (Figure 5B). This persistently high differential appears to be relatively unaffected by any specific parity-age interaction, as both parity groups display remarkably similar patterns of use across reproductive ages (Figure 5A). In contrast, Germany has the smallest parity-

Figures 1A–8B: Suffix A: Predicted probability of long-acting method use among contraceptive users, by parity and age;
 Suffix B: Difference in probability of using a long-acting method between Parity 2+ and Parity 1 (reference).

■ Parity 1 ■ Parity 2+



differential in long-acting contraceptive use of any country, with differences insignificant from ages 25 to 38, and differences ranging from only 3 to 8 percentage points from ages 39 to 49 (Figure 6B). Germany's trend in parity-differentials is the result of remarkably similar parity-specific probabilities from early- to mid-reproductive ages, followed by a slight decrease in use by parity one ages 40 and higher and a simultaneous steady increase in use by women of parity two or more.

6.2.3. Summary: Use of Long-Acting Contraception by Parity and Age

Among women who already have children, use of long-acting contraceptives is found to vary by parity (Section 6.2.1). Multiparous women are found to have a higher probability of using a long-acting contraceptive than primiparous women throughout the reproductive life course, although the heterogeneity varies by age and by country. Parity-specific trends of use of long-acting methods varies across countries, with women of parity one following region-specific trends, and women of parity two or more exhibiting comparatively homogeneous trends (Section 6.2.2). Further, there are three distinct patterns of parity-differentials observed, describing the difference in the probability at a given age of multiparous women using long-acting contraception compared to primiparous women: an inverted u-shape (*Pattern 1*), a downward sloping line (*Pattern 2*), and a relatively flat line (*Pattern 3*) (Section 6.2.2). Most countries (*Pattern 1*, *Pattern 2*) exhibit a diminishing effect of parity at or near the onset of late fertility around age 40, reflected in narrowing parity differentials, although the extent of this convergence is partially obscured by wide confidence intervals. In most cases, there does not appear to be a single common mechanism driving each pattern type, as different trends in parity-specific probabilities produce different differential patterns. Moreover, regional similarities in parity-differentials are observed in some (German-speaking and Western European), but not all countries (Nordic and Central European).

6.3. Results from the Multivariate Analysis: Incorporating Fertility Intentions

In the previous section, results found a significant association between parity and the use of long-acting contraceptives in all countries, with women of parity two more likely to use this method type than women of parity one. This association was also found to vary by reproductive age, with three distinct pattern types emerging. In this section, these associations are re-examined using a

subset of the original sample to examine whether the observed patterns are driven by an underlying difference in fertility intentions (see [Appendix Table H](#)). Descriptive statistics of the restricted sample are reported in [Appendix Table I](#) and are briefly summarized below; multivariate results are available in [Appendix Tables L–M](#).

Table 5: Proportion of women using long-acting contraception among women reporting any contraceptive use, by sample (baseline, restricted), country, parity, and age.

Age		Parity 1		Parity 2+		Age		Parity 1		Parity 2+	
		B %	R %	B %	R %			B %	R %	B %	R %
Nordic countries											
DK	25–29	34.8	50.0	46.8	44.0	NO	25–29	26.7	25.0	63.6	64.3
	30–34	26.2	33.3	47.7	54.2		30–34	30.8	44.4	47.9	52.5
	35–39	24.6	45.8	54.1	56.2		35–39	22.6	35.3	51.0	51.6
	40–44	31.2	34.2	56.9	57.1		40–44	68.8	68.8	64.5	65.9
	45–49	44.7	44.4	64.4	64.4		45–49	68.8	68.8	66.7	66.5
	$\bar{x}$	31.1	40.9	56.9	58.8		$\bar{x}$	37.1	51.5	59.3	61.2
Central European countries											
HR	25–29	8.1	28.6	21.4	19.0	CZ	25–29	0.0	0.0	8.0	15.4
	30–34	1.9	0.0	24.6	23.2		30–34	1.9	10.0	7.8	9.8
	35–39	4.8	9.1	26.6	27.6		35–39	4.3	4.0	21.6	24.8
	40–44	19.4	20.7	32.7	32.7		40–44	10.2	12.0	26.1	26.5
	45–49	36.7	36.7	40.2	40.2		45–49	33.3	34.4	31.3	31.5
	$\bar{x}$	12.2	28.6	31.4	19.0		$\bar{x}$	8.9	0.0	23.3	15.4
German-speaking countries											
AT	25–29	8.9	20.0	28.6	28.6	DE	25–29	10.9	27.3	15.9	20.0
	30–34	20.0	23.3	33.7	38.2		30–34	8.1	13.5	12.3	13.0
	35–39	20.3	20.9	50.8	55.5		35–39	20.1	22.8	16.5	17.6
	40–44	37.0	36.7	45.8	46.1		40–44	16.4	17.2	21.8	21.6
	45–49	34.3	34.3	60.4	60.4		45–49	21.7	21.7	27.5	27.6
	$\bar{x}$	24.7	29.6	48.9	51.5		$\bar{x}$	15.5	19.5	20.4	21.2
Western European countries											
FR	25–29	43.4	83.3	48.8	53.8	NL	25–29	17.9	0.0	19.0	23.1
	30–34	33.3	40.6	53.7	56.0		30–34	29.0	23.1	41.5	43.2
	35–39	40.6	48.4	56.3	58.0		35–39	24.1	34.3	45.3	46.4
	40–44	50.8	51.8	59.0	59.5		40–44	26.7	25.9	45.7	45.8
	45–49	46.2	46.2	58.9	59.4		45–49	43.6	44.7	53.6	53.6
	$\bar{x}$	42.0	49.7	57.1	58.5		$\bar{x}$	28.1	33.3	46.1	47.2
Where B is the baseline sample and R is the restricted sample of only women who reported (definitely/probably) “no” in response to the question: “Do you intend to have a/another [biological] child during the next three years?”.											
Percentages are calculated among women reporting any contraceptive use. The denominator includes long-acting, short-acting, and other contraceptive methods.											
Source: GGS Round II Wave I; own calculations.											

6.3.1. Restricted Sample: Descriptive Statistics and Average Marginal Effects

In this section, the baseline sample is restricted to include only women who report no fertility intention within the next three years. The largest compositional change from restricting the sample is seen in the youngest age groups, with the sample size reducing most substantially for women of

parity one. For multiparous women the reduction in sample size is less evident by ages 30–34, while for primiparous women this occurs at slightly later ages (35–44) depending on the country. Despite changes in sample composition, descriptive statistics of the restricted sample reveal similar patterns to the baseline sample (Table 5). Generally, a higher proportion of multiparous women report use of long-acting contraceptives than primiparous women, although there is an exception to this in some countries in the youngest age group (Croatia, Denmark, Germany France). Moreover, compared to the baseline sample, the overall reported use of long-acting contraceptives is higher in the restricted sample.

Table 6: Average Marginal Effects (AMEs) of parity on using a long-acting method among contraceptive users; comparison of baseline and restricted samples.						
Country	Sample	N	Parity (ref: 1)		95% CI	
Northern European countries						
Denmark	Baseline	1,488	0.305	***	0.217	0.394
	Restricted	1,198	0.258	***	0.161	0.355
Norway	Baseline	736	0.153	**	0.042	0.265
	Restricted	602	0.083		-0.060	0.227
Central European countries						
Croatia	Baseline	761	0.083	***	0.041	0.126
	Restricted	599	0.169	**	0.065	0.274
Czech Republic	Baseline	964	0.173	***	0.114	0.232
	Restricted	816	0.132	**	0.036	0.227
German-speaking countries						
Austria	Baseline	986	0.248	**	0.096	0.401
	Restricted	840	0.207	**	0.050	0.364
Germany	Baseline	2,208	0.040	*	0.007	0.073
	Restricted	1,874	0.036	+	-0.003	0.076
Western European countries						
France	Baseline	1,318	0.152	***	0.073	0.230
	Restricted	1,096	0.075		-0.043	0.192
The Netherlands	Baseline	1,058	0.094		-0.088	0.275
	Restricted	886	0.064		-0.138	0.267
AMEs represent differences in the predicted probability of using a long-acting (vs. short-acting or other) method for women of parity 2+ relative to parity 1.						
+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.00$.						
Age is modelled here as a squared and continuous variable.						
Source: GGS Round II Wave I; own calculations.						

Table 6 reports the Average Marginal Effects (AMEs) for the restricted sample; interpretation is the same here as in the baseline sample. Generally speaking, the main findings hold—once accounting for fertility intentions, parity is still found to have a significant association with use of a long-acting contraceptive method, with multiparous women considered more likely to use this method type than primiparous women. Compared to the original sample, AMEs for the restricted

sample have lower significance and wider confidence intervals, which is expected given the smaller sample size. Further, in almost every country the AME of parity weakens, with the exception of Croatia where it increases by almost 9 percentage points in the restricted sample. This is the largest change seen, with more modest declines in effect estimated elsewhere, particularly in Austria (-4.1%), Germany (-0.40%), and the Netherlands (-3%). Similar to the baseline sample, the AMEs of the restricted sample indicate no strong regional trends in the association between parity and the use of long-acting contraceptives.

6.3.2. Restricted Sample: Predicted Probabilities and Probability Contrasts

Similar to the baseline sample, [Figures 9–16](#) display the predicted probabilities of the use of a long-acting contraceptive at different reproductive ages, with the main explanatory variable being parity. Here, the estimates from both the baseline sample and restricted sample are plotted to compare how the probabilities vary between samples. As a reminder, the baseline sample is comprised of all women ages 25–49 who report using any method of contraception, and the restricted sample retains only women who explicitly report having no fertility intention in the next three years. By plotting predicted probabilities from both samples for each parity group, [Figures 9–16](#) aim to explore how differing fertility intentions between parities may have contributed to initial results.

Aligned with the descriptive results, restricting for fertility intention is found to have a stronger effect for estimates for parity one than for parity two or more. However, both parity groups demonstrate an increase in the probability of using a long-acting contraceptive across most ages, with some age-specific exceptions obscured by overlapping confidence intervals (e.g., the Czech Republic, Netherlands, and Norway for Parity 2+ below age 30). In general, there is remarkable similarity when comparing parity-specific probabilities between the two samples, with almost all predictions overlapping in confidence intervals between the two samples (with the sole exception of France, Parity 1, ages 25–26). There is also variation in the age at which estimates overlap between the two samples. For women with only one child, estimates of the restricted sample only begin to approximate that of the baseline sample at the earliest age 35 (Austria and the Netherlands), later in the forties (Croatia, the Czech Republic, France, Germany), or not for any of the measured ages (Denmark and Norway). This contrasts with the parity group of two or more, whose difference in estimates largely disappears between the ages of 30 to 40 depending on the

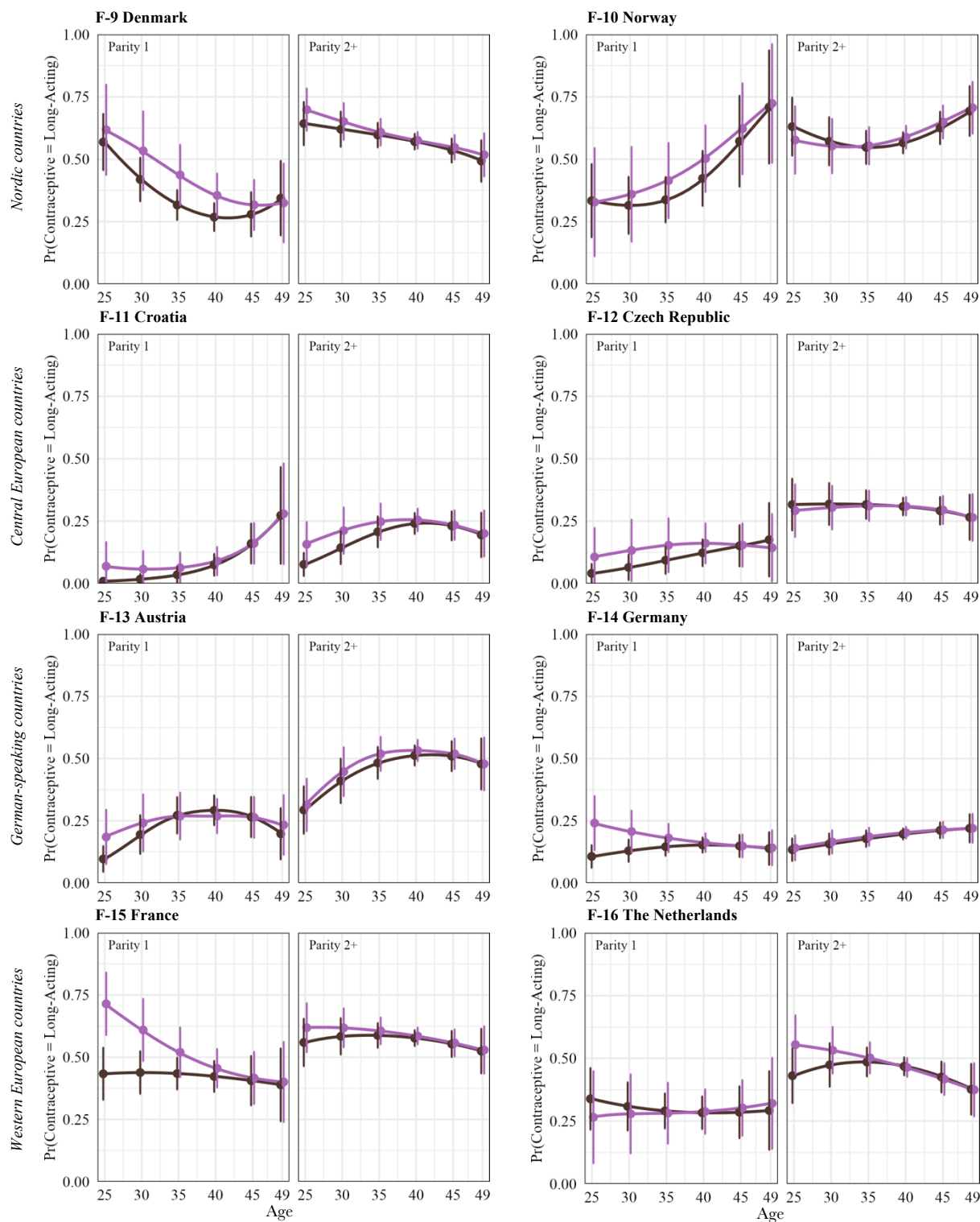
country. Overall, there are some subtle regional trends in the differences between samples observed. In the Nordic countries, predicted probabilities of use of primiparous women in the baseline sample never converge with probabilities of the restricted sample, while in all other countries the samples converge at some point for these women. Moreover, in the German-speaking countries and the Czech Republic, the two samples produce remarkably similar predicted probabilities of use, particularly among women of parity two or more.

Turning to [Figures 17–24](#), differences in probability are calculated for the restricted sample in the same manner as previously done for the baseline sample (see [Section 6.2](#)). As a reminder, these plots display the difference in probability of use of a long-acting contraceptive between the two parity groups, with parity one once again serving as the reference group. Once again, similar to parity-specific probabilities, the patterns of differences observed in the baseline sample remain for most countries. Given the smaller sample size, however, the estimated confidence intervals generally widen and the interval of ages where significant parity differences are observed narrows. For almost all countries this primarily affects parity-differentials observed at younger ages, with a significant difference in the probability of use of long-acting contraceptives observed anywhere from 0 (Austria) to 10 years older (France) in the restricted sample than in the baseline sample. Additionally, while the parity-differentials from the restricted sample yield similar maxima to the baseline sample, they tend to occur at slightly older ages here than in the baseline sample (generally increasing by 0–4 years of age).

While most countries follow a similar pattern of change upon sample restriction—maintaining a similar shape but with a loss of significance of effects—the Czech Republic and the Netherlands deviate from this pattern. In both countries, the parity-differentials in the probability of use of long-acting contraception is modelled quite differently at younger ages in the restricted sample, changing the overall pattern observed. The Czech Republic, which had previously followed *Pattern 2* ([Figure 4B](#))—characterized by a downward sloping line with the highest difference observed at the youngest age—here follows *Pattern 1*—characterized by an inverted u-shape pattern ([Figure 20](#)). The Netherlands, which previously followed *Pattern 1* ([Figure 8B](#)), now follows *Pattern 2* under the restricted sample ([Figure 24](#)). Looking back at the parity-specific

Figures 9–16: Predicted probability of long-acting contraceptive use among all contraceptive users, by parity and age; comparative results of baseline and restricted samples.

■ Baseline sample ■ Restricted sample

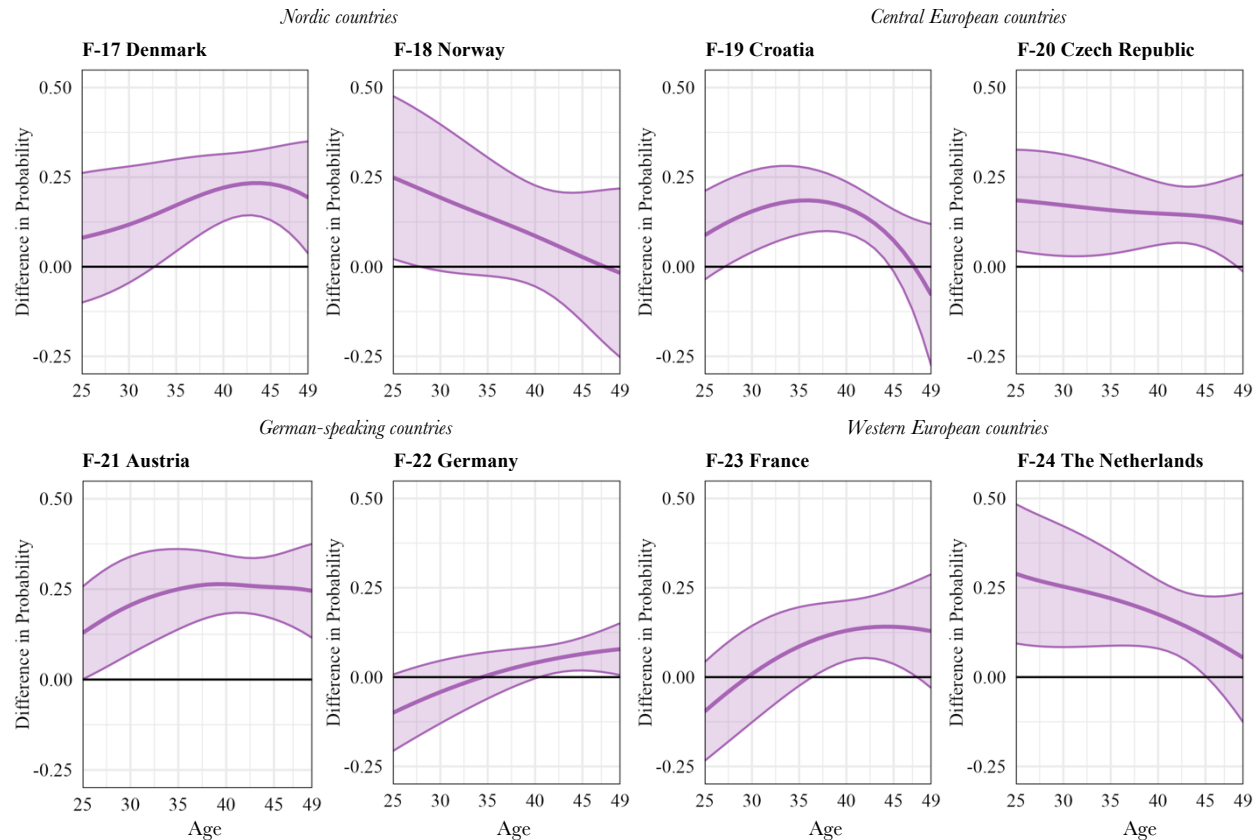


Restricted sample consists of women who reported (definitely/probably) “no” to the question: “Do you intend to have a/another [biological] child during the next three years?”. Predicted probabilities calculated with ISCED education level and time since recent birth event (in months) held at country-specific mean values.

Source: GGS Round II Wave I; own calculations.

probabilities of long-acting contraceptive use, the change observed in the Czech Republic appears to be driven by differences in use by parity one (Figure 12), while in the Netherlands the change is likely influenced by differences in use by both parity groups (Figure 16). However, it is worth noting that for both countries the restricted sample is likely influenced by small sample sizes at ages 25–29 (N=4-6), and relatedly biased results, as no primiparous women in either country report using a long-acting contraceptive method (Appendix Table I). Given this context, it can be concluded that the contrasts support the expectation that the association between parity and use of a long-acting contraceptive persists, although comparatively weaker, once accounting for fertility intentions.

Figures 17-24: Difference in the probability of using a long-acting contraceptive between Parity 2+ and Parity 1 (reference group) among contraceptive users; sample restricted to women who report no fertility intention within the next 3 years.



Restricted sample consists of women who reported (definitely/probably) “no” to the question: “Do you intend to have a/another [biological] child during the next three years?”.

Predicted probabilities calculated with ISCED education level and time since recent birth event (in months) held at country-specific mean values.

Source: GGS Round II Wave I; own calculations.

6.3.3. Summary: Accounting for Fertility Intentions in Use of Long-Acting Methods

Altogether, the restricted sample produces slightly higher probabilities of using a long-acting contraceptive for both parity groups than in the baseline sample. Among women who report no intention to have children in the next three years, the previously observed association between the use of long-acting contraceptives and parity is found to persist, albeit weaker and smaller than when fertility intentions are unaccounted for ([Section 6.3.1](#)). Restricting the sample by fertility intentions has a more substantial impact on sample composition for women of parity one than parity two or more, with the largest effect observed at younger ages. Further, differences in parity-specific probabilities between the two samples disappear at younger ages for multiparous women than for primiparous women, if at all. Combined, these changes result in parity-differentials occurring at slightly older ages in the restricted sample than in the baseline sample, although maxima values remain relatively stable ([Section 6.3.2](#)). In some countries—the Czech Republic and the Netherlands—the probability-differentials are modelled quite differently at younger ages in the new sample, changing the overall differential pattern observed in [Section 6.2](#). However, these changes can largely be explained by the small sample size produced from restricting the sample ([Appendix Table I](#)). Across the countries of study there are some regional trends, with the most similarity seen in changes in parity-specific probabilities in the German-speaking and Nordic countries, although overall, regional similarities are relatively small ([Section 6.3.2](#)).

7. DISCUSSION

7.1. Findings and Hypothesis Evaluation

This thesis analyzed how parous women's use of long-acting contraceptives varies according to their parity, and how this relationship varies at different reproductive ages and across countries. To evaluate whether fertility intentions account for part of the observed association between parity and long-acting contraceptive use, the analysis was repeated among women reporting no short-term fertility intentions. To test the related hypotheses, logistic regressions were run using data from Round II of the Generations and Gender Survey across eight European countries.

7.1.1. Hypothesis 1

Compared to other methods of contraception, long-acting methods are considered to be more supportive of fertility stopping behavior (Bearak et al., 2020). Based on previous observations of long-acting contraceptives being more commonly used among women of higher-order parity (e.g., Bajos et al., 2012; Gray & McDonald, 2010; Guibert-Lantoine & Landon, 1999; Haimovich, 2009), it was hypothesized that *women of parity two or more would be more likely to use a long-acting contraceptive method than women of parity one*. The results largely support this hypothesis, finding a higher use of long-acting contraceptives among multiparous women across countries, and significant observations observed in all countries once reproductive age was incorporated (Section 6.2). Additionally, considering the differing propensity for parity progression, it was further hypothesized that *multiparous women will have less cross-national variation in long-acting contraceptive use than women of parity one*. Across countries, the results show a stronger regional association of usage patterns for primiparous women than for multiparous women, supporting the hypothesis that primiparous women's use of long-acting contraception is more sensitive to differences in the social and institutional environment (Section 6.2.2.1).

7.1.2. Hypothesis 2

Given both the independent influence of age on contraceptive use and the potential for parity differences to vary across the reproductive life course, long-acting contraceptive use was modelled by parity across ages 25 to 49. While previous studies emphasized the importance of both age and parity in contraceptive behavior, they did not directly examine their joint association (Eeckhaut et

al., 2014; Lindh et al., 2010; Ruiz-Muñoz & Pérez, 2013). For this reason, the expected effects in the early and middle reproductive years were uncertain. Nevertheless, there was reason to expect that the effect of parity would diminish at or around age 40 due to the biological and social constraints of late fertility (Billari et al., 2007; Billari et al., 2011; Bongaarts, 1982; Huinkink & Kohli, 2014). Accordingly, the second hypothesis was that *the association between parity and long-acting contraceptive use varies across age, with parity differences diminishing during later reproductive years*. Results confirmed an association between parity, age, and long-acting contraceptive use, with three distinct patterns. The second hypothesis was only partially supported, however, as only six of the countries found a diminishing effect of parity across late fertility (Section 6.2). Instead, in Germany and Austria the parity-differentials of using long-acting methods *increased* at the onset of late fertility, for which possible explanations are explored further below.

7.1.3. Hypothesis 3

Previous studies have found that alongside parity and age, fertility intentions are strongly associated with contraceptive behavior (Dereuddre et al., 2016; Lindh et al., 2010; Gray & McDonald, 2010; Skouby, 2004). This relationship is conceptualized in the Medial Motivations Theory, which postulates that contraception is used for either birth spacing, postponement, or stopping (Timæus & Moultrie, 2008). As long-acting contraception is considered to be conducive of fertility stopping, fertility intentions were expected to have some association with use of these contraceptive methods. However, following the Cognitive-Social Model's distinction between fertility intentions and fertility-regulation intentions—with the latter more directly linked to contraceptive behavior—it was hypothesized that parity-differentials in long-acting contraceptive use would persist among women reporting no short-term fertility intentions (Bachrach & Morgan, 2013). The third hypothesis therefore expected that *the association between parity and long-acting contraceptive use would persist among women reporting no short-term fertility intentions, but parity differences would be smaller than those observed in the baseline sample*. Results from the restricted sample indicated that some of the parity differentials observed in the baseline sample could be partially explained by the differences in the underlying fertility intentions between parities. However, among only women who reported no fertility intention within the next three years, women of parity two were still found to have a higher probability of being a long-acting contraceptive user, supporting the third hypothesis (Section 6.3). More broadly, the general

patterns of use previously observed remained for the restricted sample, with deviations reflecting the reduction in sample size.

Altogether, the hypotheses are substantially supported by the results of the analysis. Across the countries of study there are several generalizable findings: (1) long-acting contraceptive use varies by parity across the reproductive life; (2) multiparous women are more likely to be users of long-acting contraceptives than primiparous women; and (3) fertility intentions account for some, but not all, of the parity-differentials in long-acting contraceptive use. Nevertheless, several findings both reinforced and complicated the initial expectations, warranting broader discussion and interpretation.

7.2. Broader Implications of the Findings

Taken together, the findings of this thesis point toward several broader themes regarding the complexity of contraceptive behavior across differing reproductive, demographic, and institutional contexts. Three themes are explored in more depth in the following section.

7.2.1. Contraceptive Use Differs Meaningfully by Method Type

At its core, the findings highlight the complexity of contraceptive use, and the heterogeneity in behavior across women of different parities, ages, and countries. In the standard indicators of contraception (e.g., Unmet Need for Family Planning), these nuances are obscured, creating a limited—and sometimes inaccurate—portrayal of use (Fabic & Becker, 2017; Karra, 2022; Lapham & Maludin, 1985; Rodríguez et al., 2014; Senderowicz & Maloney, 2022; Swiatlo et al., 2023). In the countries of analysis, estimated contraceptive use generally varies little, with 63–68% of women of reproductive age estimated to use some form of contraception in six of the eight countries (UN DESA, 2022). This conveys a relative homogeneity of contraceptive use, an implication which is not supported from the results of this analysis.

7.2.1.1. Case Study: Findings from Germany

Instead, the findings show that a range of heterogeneities emerge when contraception is disaggregated into different method types. Perhaps the clearest example of this is the findings from

Germany. Compared to the other countries of analysis, Germany is considered to have one of the most supportive contraceptive regimes (EPF, 2026) and is estimated to have one of the highest rates of contraceptive use, with 70% of women of reproductive age estimated to use at least one method of contraception (Scharmanski & Hessling, 2024). The descriptive results, however, find that with only 19% of the sample reporting use of a long-acting contraceptive, Germany has the lowest usage rate of long-acting methods among the countries of study (Section 5.1, Table 1). This contradicts the expectation that greater access to effective contraception will translate into greater adoption of the contraceptive methods best suited to achieving desired fertility outcomes (Becker, 1960; Easterlin, 1975). The results of the multivariate analysis further reveal that the low usage rates of long-acting contraception are relatively persistent across both parity and age, differing from the results of the other countries (Section 6.2.2). This raises the question: In comparison to the other countries of study, why is the use of long-acting contraception less common and more uniform across parity and age in Germany? One possible explanation is sociocultural norms. In recent years, the German-speaking countries have begun to diverge from Europe in the popularity of different contraceptives. While other European countries have had a steady share of women using modern methods, both Germany and Austria have experienced a decline in hormonal contraceptive use from 1990 to today and have seen a corresponding increase in reliance on the condom (Dereuddre, 2017; Tschudin, 2021). This trend is accredited in part to a general critical attitude, and increasing skepticism, toward hormonal contraceptives (Scharmanski & Hessling, 2024). For Germany, these societal changes help explain the overall low levels of long-acting contraceptive use observed in the results. More broadly, the results from Germany show the value of analyzing contraceptive behavior beyond aggregate usage rates.

7.2.1.2. Method Use Differs Across the Reproductive Life Course

The results also demonstrate the importance of incorporating the perspective of the reproductive life course when examining contraceptive use. Although previous studies have found contraceptive behavior to vary according to both parity and age, limited attention has been given to the interrelated nature of the two, instead treating them as separable from one another (Bajos et al., 2012; Eeckhaut et al., 2014; Lindh et al., 2010; Ruiz-Muñoz & Pérez, 2013). However, this analysis suggests that this approach can oversimplify patterns of contraceptive behavior, obscuring nonconformity in contraceptive use according to different stages of the reproductive life. For women of parity two or more, the findings support the argument that long-acting contraception is

used by some to enable fertility stopping (Bajos et al., 2012; Guibert-Lantoine & Leridon, 1999; Haimovich, 2009). This is substantiated by the finding that multiparous women have a higher probability of use than primiparous women at all measured ages (Section 6.2). Additionally, the finding that, regardless of parity, women who report no short-term fertility intention have higher usage rates of long-acting contraception than all women, supports the fertility stopping proposition for both primiparous and multiparous women (Section 6.3.2). Still, the results also indicate that the motivation for long-acting contraceptive use may differ according to parity and age. In Denmark, high rates of use by both parity groups at age 25 suggest that long-acting contraception can be used for both fertility postponement and stopping (Section 6.2, Figure 1A). Furthermore, the persistence of parity-differentials in use among women reporting no fertility intention suggests that different groups of women may use long-acting contraception to enable different fertility regulation strategies (Section 6.3.2). Perhaps what is considered a stopping method for women of parity two or more is a postponement method for women of parity one. While these observations are descriptive and conclusive evidence is outside the scope of this research, the findings do show that contraceptive use is more varied than aggregate measures account for.

7.2.2. Contraception is Part of the Wider Fertility Puzzle

Another central finding of this thesis is the complexity of the relationship between contraception and the wider institutional, social, and demographic contexts in the countries of study. Although aggregate estimates of long-acting contraceptive use clearly showed some cross-national variance in long-acting contraceptive use (Section 5.1, Table 1), the results of the multivariate analysis reveal additional heterogeneities. When results are contextualized within national contexts, similarities and differences in contraceptive behavior often emerge in ways that are not fully explained by broad institutional or demographic characteristics.

7.2.2.1. Regional Contexts and Fertility Regulation

Examining countries within selected regional contexts provides further insight into the relationship between contraceptive behavior and the broader fertility context. However, the results suggest that similarities and differences in social and institutional arrangements do not always translate into the expected patterns of contraceptive use.

Western European Countries

Despite differences in social and institutional norms, France and the Netherlands are found to have remarkably similar patterns of long-acting contraceptive use across the reproductive life. This is somewhat unexpected, as women in the two countries face different expectations surrounding motherhood and employment, and thus different circumstances surrounding the transition to higher-order parities. In France, mothers are more likely to remain in full-time employment and make use of formal childcare services, whereas in the Netherlands mothers more commonly transition to part-time employment and are expected to take on a greater share of childcare responsibilities (Lewis et al., 2008; Mills, 2015; Mills & Täht, 2010; Toulemon et al., 2008; van Nimwegen et al., 2002; Wood et al., 2014). Based on both the rational-actor models of fertility (e.g., [Quality-Quantity Model](#), [Supply-Demand Framework](#), [Wealth Flows Theory](#)) and the gender-equity perspective on fertility (McDonald, 2000), these differences would suggest that women might have different fertility-regulation strategies due to the different trade-offs between family and employment. However, the results show a remarkable degree of similarity. Although the Netherlands consistently has lower probabilities of long-acting contraceptive use than France, both countries display similar trajectories of use across age and produce comparable patterns of parity differentials ([Section 6.2.2](#), [Figures 7A–8B](#)). This suggests that the relationship between parity and long-acting contraceptive use may not be determined by specific family or welfare arrangements alone. Rather, what may matter is whether these arrangements provide women with sufficient support to achieve their reproductive intentions under the expectations placed upon them.

Nordic Countries

In contrast, the results from the Nordic countries reveal an expected heterogeneity in long-acting contraceptive use despite similar social and institutional context. Denmark and Norway share overlapping social and institutional norms of motherhood, supported by universal welfare, high levels of gender equality, and strong institutional support for working mothers (Ellingsæter & Leira, 2006; Hellstrand et al., 2021; Lewis et al., 2008). Given these similarities, it could reasonably be expected that parity would have a comparable association between long-acting contraceptive use in both countries. Instead, Denmark and Norway display substantially different parity effects and patterns of use across the reproductive life course ([Section 6.2](#), [Figures 1A, 2A](#)).

These differences are surprising, as the Nordic countries are generally found to have similar patterns of contraceptive use (Hognert et al., 2017; Skjeldestad et al., 2026). Exactly why this divergence exists is unclear. One possibility is that subtle differences in contraceptive accessibility and reproductive autonomy shape fertility regulation differently across the two countries (Shelton & Angle, 1992; Steiner et al., 2025; Zigel & Tamakoshi, 2026). However, it is not even clear how the two countries compare on these dimensions, as the available evidence is contradictory. Some studies suggest that Norway offers broader provider access and reimbursement options of contraception (Furu et al., 2021; Skjeldestad et al., 2026), while comparative policy analyses rank Denmark as the more accessible system for contraception overall (EPF, 2026; Zigel & Tamakoshi, 2026). As a result, it is difficult to infer whether differences in contraceptive policy or accessibility might be responsible for the observed differences. Regardless, the findings highlight the importance of analyzing contraceptive behavior in both a regional and national context.

7.2.2.1. National Contexts and Fertility Regulation

While regional comparisons reveal that similar contexts do not always produce similar contraceptive behaviors, country-specific findings provide additional insight into the mechanisms that may underlie these differences. The results from Croatia and Austria illustrate how different national contexts and barriers to contraception can be associated with distinct patterns of long-acting contraceptive use.

Croatia

One example of how national contexts may shape contraceptive behavior is found in Croatia. Compared to the other countries of study, women in Croatia have low probabilities of using long-acting contraception, particularly during the earlier reproductive years. Long-acting contraceptive use among young women is substantially lower than in other countries analyzed, and although these differences become less pronounced at older ages, Croatia continues to exhibit comparatively low levels of use throughout the reproductive life course (Section 6.2.2.3, Figure 3A). Importantly, the low rates of use are observed among both parity groups, suggesting that the pattern is not solely the result of parity-specific fertility regulation strategies. Instead, the findings point toward broader barriers affecting access to long-acting contraception. One possible explanation is the comparatively limited institutional support for contraception in Croatia. Following the dissolution of the Soviet Bloc, both abortion and contraception were largely removed from the list of

subsidized health services, reflecting a broader shift in a reduction in family support observed across Central and Eastern Europe (Macura & MacDonald, 2003; Shiffman et al., 2002). Today, Croatia remains among the less supportive European countries in terms of contraceptive policy, with no reimbursement available for long-acting methods and no targeted financial support for vulnerable groups (EPF, 2026). Additional barriers may arise from the healthcare system itself. In Croatia, hormonal contraception can only be prescribed by gynecologists (Zelić et al., 2014), and according to the Ministry of Health, only 7.5% of women of reproductive age who visited a gynecologist's office in 2010 received a prescription for contraception (Ministry of Health of the Republic of Croatia, 2012). Taken together, these findings suggest that barriers to access may suppress long-acting contraceptive use across the reproductive life course, regardless of parity.

Austria

Austria presents a different example of how national contexts may shape contraceptive behavior. Unlike Croatia, Austria does not exhibit unusually low levels of long-acting contraceptive use overall. Instead, the distinctive feature of the Austrian results is the remarkable stability of parity differentials across age. While the other countries display changing relationships between parity and long-acting contraceptive use over the reproductive life course, Austria is characterized by nearly parallel trajectories of use for women of parity one and parity two or more, resulting in a consistently large parity differential across all ages (Section 6.2.2.4, Figure 5B). This pattern is particularly notable because it persists even when the sample is restricted to women reporting no short-term fertility intentions. One possible explanation is the comparatively high cost of accessing contraception in Austria. Unlike many European countries, most contraceptive costs—including counselling and the contraceptive method itself—are paid for privately rather than covered at least in part through health insurance (Gaiswinkler et al., 2024). These costs may be particularly consequential for long-acting methods, which require higher upfront expenditures. Supporting this interpretation, one survey found that 56% of Austrian women would switch to a long-acting method if it were not for prohibitive costs (Fiala & Parzer, 2019). At the same time, Austria has experienced a broader decline in hormonal contraceptive use and a corresponding increase in reliance on condoms, a trend partly attributed to growing skepticism toward hormonal contraception (Scharmanski & Hessling, 2024; Tschudin, 2021). Combined with the role of the Catholic Church in the country (Limacher et al., 2023), these financial and sociocultural factors suggest that long-acting contraceptive use in Austria may be concentrated among women with

particularly strong preferences for these methods. This could help explain why parity differentials remain so stable across age: rather than changing in response to life-course transitions, long-acting contraceptive use may be more strongly shaped by persistent preferences and willingness to overcome the financial and social barriers associated with these methods.

More broadly, the comparison between Croatia and Austria illustrates that barriers to contraception do not necessarily produce the same behavioral outcomes. While some barriers may suppress contraceptive use across the population, others may influence which women adopt particular methods and under what circumstances.

7.2.3. The Link Between Fertility and Contraception is Not Direct

The findings from the restricted sample suggest that the relationship between fertility intentions and contraceptive behavior is more complex than is often assumed. Although fertility intentions are associated with long-acting contraceptive use, women reporting similar fertility intentions continued to exhibit different patterns of contraceptive behavior across parity and age. This suggests that fertility intentions alone do not fully account for the observed differences in long-acting contraceptive use.

Restricting the analysis to women reporting no intention to have a child within the next three years increased the predicted probability of long-acting contraceptive use among both parity groups and reduced the parity differentials (Section 6.3.2). This finding is consistent with previous research identifying fertility intentions as an important predictor of contraceptive behavior (Dereuddre et al., 2016; Lindh et al., 2010; Skouby, 2004). At the same time, the broader patterns observed in the baseline sample remained largely unchanged—women of parity two or more continued to have higher probabilities of long-acting contraceptive use than women of parity one—indicating that differences in fertility intentions explain only part of the relationship between parity and contraceptive behavior.

One possible explanation is that women occupying different positions in the reproductive life course may report similar short-term fertility intentions while facing different reproductive circumstances. The fertility intention measure used in this analysis captures whether a woman

intends to have a child within the next three years, but it does not distinguish between women who are postponing, spacing, or stopping childbearing. As Timæus and Moultrie (2008) note, these distinctions are often difficult to identify empirically, and the boundaries between them are not always clear. This may be particularly relevant for long-acting contraception, which can facilitate multiple fertility-regulation strategies depending on an individual's circumstances. Consequently, women who report similar fertility intentions may nevertheless differ in their certainty regarding future childbearing, their desired timing of births, and the contraceptive strategies they use to achieve these goals.

More broadly, the findings suggest that fertility intentions provide only a partial picture of fertility regulation across the reproductive life course. Just as aggregate measures of contraceptive use can obscure important differences in method use, and aggregate comparisons between countries can obscure important contextual differences, women reporting similar fertility intentions may nevertheless pursue different reproductive strategies. The persistence of parity-differentials in the restricted sample therefore suggests that fertility intentions explain only part of the variation in long-acting contraceptive use observed across the reproductive life course.

7.3. Limitations

Like all research, this thesis is subject to several limitations. One significant limitation is that the data used is cross-sectional, limiting the extensibility of the results. Although the Generations and Gender Survey Round II (GGS-II) provides longitudinal data, ultimately, it was decided to use the most recently available data and to maximize the number of countries of study, resulting in cross-sectional analysis. As a result, this analysis is unable to disentangle period versus cohort effects, both of which have been shown to influence contraceptive behavior (Le Guen et al., 2020).

Another noteworthy limitation is that this analysis relies upon the surveyed measurement of contraceptive use, which has several disadvantages. Although common throughout Europe, contraception is considered sensitive and private by many, potentially affecting the reliability and availability of reported use. Self-reported survey data of contraceptive behavior has been found to be sensitive to social-desirability bias (Hall et al., 2010; Stuart & Grimes, 2009) and to be less

reliable than administrative data such as pharmaceutical claims (Triebwasser et al., 2015). Moreover, as detailed in [Section 9.2](#), survey questions on contraceptive use are subject to non-response which can result in self-selection bias, limiting the generalizability of the results. A study by Bond and colleagues (2022) in the United States found that non-response to sexual health surveys is associated with both lower income and lower education; as both are associated with use of less effective contraception (Sobotka, 2004), it is possible that the results of this analysis overestimate contraceptive use compared to that of the true population.

There are also several issues with how contraceptive use is specifically captured in the Generations and Gender Survey. In the GGS-II, contraceptive use is only recorded in reference to one time period, rather than for a longer period of time, limiting the ability to capture contraceptive switching or discontinuation, both of which are frequent aspects of contraceptive behavior (Cibula, 2008; Costescu et al., 2022; Johnson et al., 2013; Moreau et al., 2009). Further, while the GGS-II is generally comprehensive in the available contraceptive methods respondents can report, some methods are underspecified. For this analysis, the most pertinent example is the available responses to report use of the intrauterine (IUD). While all IUDs are considered long-acting contraceptives, there are two main types: hormonal and non-hormonal. Usage rates between the two variants can vary substantially (Eggebrecht et al., 2025), and, given the increasing skepticism of hormonal contraceptives in some of the countries of study (Scharmanski & Hessling, 2024), the analysis could have benefited from additional disaggregation of IUDs.

Additionally, it is important to note that there are major cross-national differences in how contraceptive use is captured in the GGS. As previously mentioned in [Section 5.1.1](#), many countries were ineligible for inclusion in this analysis due to differences in the methods of contraception that could be reported, such as a specific option to report “no method” being used. Among the countries studied in this thesis, the contraceptive method of “other” was reported among less than 10% of respondents in most countries, however rates were much higher in Denmark and the Czech Republic, particularly amongst the oldest age groups. As outlined in the data and methods, none of these women had responded “no method used” and instead responded “other”, indicating that the available contraceptive methods for reporting in the GGS-II are likely insufficient for certain women ([Appendix Tables F–G](#)).

Finally, portions of this analysis relied on surveyed fertility intentions, potentially limiting the results. One such limitation is the reliability of responses, as research has demonstrated that reported intentions can change significantly across the reproductive life course (Ray et al., 2018), can be inexplicit or uncertain (Berrington, 2004; McQuillan et al., 2011; Sennott & Yeatman, 2018; Trinitapoli & Yeatman, 2017), and can be sensitive to measurement context (Bhrolcháin & Beajouan, 2018; Morgan & Rackin, 2010). Another limitation is the reliability of the findings for the section of analysis that relies upon fertility intentions, given the sample sizes of each group (Section 6.3). While less of a concern for women of parity two or more—as 88.7–93.5% of the baseline sample reported no short-term fertility intentions (see Appendix Table H)—restricting by fertility intention resulted in small sample sizes for some age groups of parity one (Appendix Table I). As shown from results from the Czech Republic and the Netherlands, results were likely affected by the smaller samples, particularly at younger age groups (Section 6.3.2).

7.4. Future Research and Recommendations

The findings of this thesis raise several questions that warrant further investigation. Three particularly promising directions for future research are discussed below.

Future research could further examine how fertility regulation and women’s perception of fertility regulation changes across the reproductive life course. While this thesis identifies systematic differences in long-acting contraceptive use according to parity and age, longitudinal analyses could investigate transitions into and out of contraceptive use following parity progression, as well as patterns of contraceptive switching and discontinuation. Further, it is imperative to incorporate women’s attitudes and perceptions of contraception. This can help clarify whether the persistent parity differentials observed among women with similar fertility intentions reflect differences in spacing, postponement, or stopping behavior. Further, it adopts a more person-centered approach to studying contraception and can better capture the decision-making process in fertility regulation (Karra, 2022; Moreau et al., 2009; Senderowicz, 2020; Senderowicz & Maloney, 2022; Swiatlo et al., 2023).

A second avenue for future research concerns the broader social and institutional contexts within which fertility regulation occurs. The findings of this thesis suggest that contraceptive behavior is heterogeneous across Europe, with differences found within regions, similar welfare regimes, and shared histories. This is consistent with recent work finding regional differences in contraceptive use (Dereuddre et al., 2016), and differences in reproductive autonomy within broader welfare provisions (Zagel & Tamakoshi, 2026). Further, research should examine within-country differences, as contraceptive access and behavior is likely to vary according to local norms, policy, and available services (Colleran & Mace, 2015; Frias et al., 2026; Ioannidi-Kapolou, 2004).

Finally, future research would benefit from greater attention to the interpersonal dynamics of fertility regulation. In this thesis, patterns of long-acting contraceptive use were studied only among women. Previous research, however, has shown the importance of also studying fertility regulation from a couple perspective, as contraceptive use is often made as a joint decision (Freitas & Testa, 2017; Zabin, et al., 2000). Utilizing a couple perspective may therefore provide a more complete understanding of contraceptive decision-making across the reproductive life course (Huinink & Kohli, 2014). Couple research may also allow for opportunities to challenge customary assumptions used in contraceptive research, such as the assumption of exposure to heterosexual intercourse. While research is limited, findings indicate that sexual minorities have unique patterns of contraceptive use, are at a higher risk of adverse outcomes of contraceptive non-use, and are generally underrepresented in demographic data collection and research (Ela & Budnick, 2017; Higgins et al., 2019; Ruberg & Ruelos, 2020; Schönpflug, 2018).

8. CONCLUSION

This thesis examined the association between parity and long-acting contraceptive use among parous women in eight European countries using data from Round II of the Generations and Gender Survey. Drawing on theories of fertility preferences and fertility regulation, the study investigated whether parity was associated with the use of long-acting contraceptive methods, whether this relationship varied across reproductive age and country, and whether the observed patterns persisted among women reporting no short-term fertility intentions.

The findings indicate that parity is meaningfully associated with long-acting contraceptive use. Across the countries of study, women of parity two or more generally had a higher likelihood of using long-acting methods than women of parity one. However, the magnitude of these differences varied according to reproductive age and national context, highlighting the importance of considering contraceptive behavior within the broader reproductive life course. The results also show that fertility intentions explain part, but not all, of the relationship between parity and contraceptive use. When the analysis was restricted to women reporting no short-term fertility intentions, parity differences in long-acting contraceptive use were reduced but remained evident. This suggests that anticipated childbearing contributes to differences in contraceptive behavior across parity groups but does not fully account for them.

Taken together, the findings support the proposition that long-acting contraception serves as an important means of fertility regulation after desired family size has been reached. Multiparous women consistently exhibited higher probabilities of use than primiparous women, while women reporting no short-term fertility intentions generally displayed higher levels of long-acting contraceptive use than women in the baseline sample. Although individual motivations cannot be directly observed, these patterns are consistent with the use of long-acting methods as a means of fertility stopping. At the same time, the findings demonstrate that contraceptive behavior cannot be understood solely through fertility intentions or parity. Patterns of use varied across ages and countries, and parity-differentials persisted even among women with similar short-term fertility intentions. These results suggest that contraceptive behavior reflects a broader set of fertility-

regulation strategies that differ across stages of the reproductive life and across social and institutional contexts.

More broadly, the findings demonstrate that fertility regulation cannot be understood solely through measures of fertility intentions or fertility outcomes. Rather, reproductive behavior is shaped throughout the reproductive life course by the interaction of individual preferences, life-stage circumstances, and wider social and institutional contexts. Consequently, understanding contemporary fertility patterns requires attention not only to fertility outcomes themselves, but also to the reproductive behaviors and decisions that shape them across the reproductive life course.

9. END NOTES

9.1. Usage Statements

9.1.1. Generations and Gender Survey (GGS) Usage Statement

This paper uses data from the Generations and Gender Programme (www.ggp-i.org). The Generations and Gender Programme has received funding from the European Commission, its Consortium Board Members, and National Funding Bodies, which are gratefully acknowledged.

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- Austria*: Neuwirth, N., Baierl, A., Berghammer, C., Boujouan, E., Buber-Ennser, I., Fux, B., Riederer, B., Setz, I., Wernhart, G., Wurm, L., Grunwald, O., Connolly, A., and Ritzenthaler, T. (2024). Austrian Harmonized Generations and Gender Survey-II. Wave 1 (2023). Version 1. Data obtained from the GGP Data Archive.
- Croatia*: Čipin, I., Međimurec, P., Mustač, D., Smolić, Š., & Fabijančić, M. (2024). Generations and Gender Survey Croatia, Round 2 – Wave 1: Data Collection Process. Technical working paper. The Hague: Netherlands Interdisciplinary Demographic Institute.
- Czech Republic*: Kreidl, M., Šťastná, A., Kocourková, J., Hamanová, J., Zvoníček, T., Slabá, J., Hubatková, B., Matysiak, A., Rijken, A., Kong, S., Grunwald, O., Winn Lombard M. and Caporali, A. (2023). Czech Harmonized Generations and Gender Survey-II. Wave 1 (2020-2022). Version 1. Data obtained from the GGP Data Archive.
- Denmark*: Fallesen, P., Rasmussen, E., Trille, L., Loft, G., Rijken, A., Beaupré, P., Grunwald, O., and Lombard, M., Caporali, A. (2023). Danish Harmonized Generations and Gender Survey-II. Wave 1 (2021). Version 1. Data obtained from the GGP Data Archive.
- France*: Bouchet-Valat, M., Toulemon, L., Breda-Popa, R., Markou, E., Cochet, P., Rijken, A., Kong, S., Beaupré, P., Grunwald, Connolly, A., and Ritzenthaler, T. (2025). French Harmonized Generations and Gender Survey-II. Wave 1 (2024). Version 1. Data obtained from the GGP Data Archive
- Germany*: Bujard, M., Gummer, T., Hank, K., Neyer, F. J., Pollak, R., Schneider, N., Spieß, C. K., Wolf, C., Bauer, I., Börlin, S. Bretsch, D., Brüggemann, K., Christmann, P., Eigenbrodt, F., Englert, C., Frembs, L. C., Groß, K., Kunz, T., Lück, D., Naderi, R., Naumann, E., Nutz, T., Oehrlein, A.-S., Ruckdeschel, K., Schmid, L., Schumann, A.,

- Schumann, N., Stein, A., Thönnissen, C., Ullrich, E., Grunwald, O., Connolly, A., and Ritzenthaler, T. (2024). German Harmonized Generations and Gender Survey-II. Wave 1 (2023). Version 1. Data obtained from the GGP Data Archive.
- The Netherlands*: Liefbroer, A. C., Henkens, J., Rijken, A., Grunwald, O., Connolly, A. and Ritzenthaler, T. (2025). Dutch Harmonized Generations and Gender Survey-II. Wave 1 (2024). Version 1. Data obtained from the GGP Data Archive
- Norway*: Dommermuth, L., Lappegård, T., Beaupre, P., Jablonski, W., Koops, J. C., Rijken, A., and Caporali, A. (2021). Norwegian Harmonized Generations and Gender Survey-II. Wave 1 (2020). Version 1. Data obtained from the GGP Data Archive.

9.1.2. Artificial Intelligence Usage Statement

I acknowledge the use of ChatGPT by OpenAI in preparation of this thesis. AI was used selectively, with the primary use cases including conceptualization, linguistic formulating, and coding assistance, including debugging and syntax. All writing, analysis, and ideas are my own. I am fully responsible for the selection, adoption, and all results of any AI-generated output used in this thesis.

9.1.3. Statistical Software Usage Statement

All analyses were conducted in the statistical software program, R. The following packages were used, listed in alphabetical order: *flextable*, *formatR*, *glue*, *haven*, *janitor*, *marginaleffects*, *nnet*, *officer*, *patchwork*, *survey*, *tidyverse*, *webshot2*.

9.1.4. Translation Software Statement

The free version of DeepL Translator by DeepL was used for the preliminary translation of the abstract from English into German.

9.2. Missingness Across Countries

In order to obtain reliable results, countries were independently examined for the degree of missingness in the variables of analysis. Of primary concern was the degree of missingness in the outcome variable, contraceptive method, and its distribution within each parity group. Overall, most countries analyzed had a reasonable proportion of missing contraceptive values with less than 20% of the total sample missing a value on contraceptive use. Compared to other countries, Germany is a clear outlier, with 29.1% of the total sample missing contraceptive use data. Further, Germany has a significantly higher share of women in each parity group missing contraceptive data, particularly for parity one (38.1%). In most countries, there is a higher rate of missingness among primiparous women than multiparous women. However, the difference between parity groups is relatively minimal (1–3 percentage points), with the exception of Norway (7.7 percentage points) and Germany (16.3 percentage points). Altogether, the observed patterns suggest that missingness in contraceptive use is generally modest and relatively balanced across parity groups in most countries. Nevertheless, the substantially higher levels of missing data observed in Germany, and to a lesser extent Norway, warrant some caution when interpreting country-specific estimates, as differential missingness may introduce bias into the observed patterns.

Table A: Distribution of missing contraceptive values in the full sample by country and parity group.			
Country	Total (%)	Parity 1 (%)	Parity 2+ (%)
<i>Nordic countries</i>			
Denmark	4.1	4.7	2.4
Norway	8.0	11.9	4.2
<i>Central European countries</i>			
Croatia	18.3	15.4	14.7
Czech Republic	5.4	6.4	3.7
<i>German-speaking countries</i>			
Austria	12.5	8.5	9.5
Germany	29.1	38.1	21.8
<i>Western European countries</i>			
France	7.6	6.0	5.3
The Netherlands	12.8	12.1	9.7
Full sample is women aged 25–49.			
Source: GGS Round II, Wave 1, own calculations.			

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6B	6.2.2	DE	Difference in probability of using a long-acting contraceptive between Parity 2+ and Parity 1.
7A	6.2.2	FR	Predicted probability of using a long-acting contraceptive by parity and age.
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8A	6.2.2	NL	Predicted probability of using a long-acting contraceptive by parity and age.
8B	6.2.2	NL	Difference in probability of using a long-acting contraceptive between Parity 2+ and Parity 1.
9	6.3.2	DK	Predicted probability of using a long-acting contraceptive by parity and age; results of the baseline and restricted samples.
10	6.3.2	NO	Predicted probability of using a long-acting contraceptive by parity and age; results of the baseline and restricted samples.
11	6.3.2	HR	Predicted probability of using a long-acting contraceptive by parity and age; results of the baseline and restricted samples.
12	6.3.2	CZ	Predicted probability of using a long-acting contraceptive by parity and age; results of the baseline and restricted samples.
13	6.3.2	AT	Predicted probability of using a long-acting contraceptive by parity and age; results of the baseline and restricted samples.
14	6.3.2	DE	Predicted probability of using a long-acting contraceptive by parity and age; results of the baseline and restricted samples.
15	6.3.2	FR	Predicted probability of using a long-acting contraceptive by parity and age; results of the baseline and restricted samples.

Figure	Section	Country	Description
16	6.3.2	NL	Predicted probability of using a long-acting contraceptive by parity and age; results of the baseline and restricted samples.
17	6.3.2	DK	Difference in the probability of using a long-acting contraceptive between Parity 2+ and Parity 1; sample restricted to women who report no fertility intention within the next 3 years.
18	6.3.2	NO	Difference in the probability of using a long-acting contraceptive between Parity 2+ and Parity 1; sample restricted to women who report no fertility intention within the next 3 years.
19	6.3.2	HR	Difference in the probability of using a long-acting contraceptive between Parity 2+ and Parity 1; sample restricted to women who report no fertility intention within the next 3 years.
20	6.3.2	CZ	Difference in the probability of using a long-acting contraceptive between Parity 2+ and Parity 1; sample restricted to women who report no fertility intention within the next 3 years.
21	6.3.2	AT	Difference in the probability of using a long-acting contraceptive between Parity 2+ and Parity 1; sample restricted to women who report no fertility intention within the next 3 years.
22	6.3.2	DE	Difference in the probability of using a long-acting contraceptive between Parity 2+ and Parity 1; sample restricted to women who report no fertility intention within the next 3 years.
23	6.3.2	FR	Difference in the probability of using a long-acting contraceptive between Parity 2+ and Parity 1; sample restricted to women who report no fertility intention within the next 3 years.
24	6.3.2	NL	Difference in the probability of using a long-acting contraceptive between Parity 2+ and Parity 1; sample restricted to women who report no fertility intention within the next 3 years.

11.2. List of Tables

Table	Section	Type	Description
1	5.1	Data Information <i>Summary</i>	Survey collection details; countries of analysis.
2	5.2	Data Information <i>Summary</i>	Contraceptive methods and core attributes.
3	6.1	Baseline Sample	Descriptive statistics. Proportion of women using long-acting contraception as method type by country, parity, and age.
4	6.2.1	Baseline Sample	Multivariate results. Average marginal effect of parity on using a long-acting contraceptive method.
5	6.3.1	Both Samples	Descriptive statistics. Proportion of women using long-acting contraception as method type, by sample (baseline, restricted) country, parity, and age.
6	6.3.1	Both Samples	Multivariate results. Comparison of average marginal effects of parity on using a long-acting contraceptive method between samples (baseline, restricted).
A	9.2	Baseline Sample	Multivariate results. Distribution of missing contraceptive values by country and parity.
B	12.1	Data Information	Survey collection details; countries of analysis.
C	12.1	Data Information	List of variables used for analysis.
D	12.1	Data Information	Country-specific deviations in the reporting of contraceptive methods.
E	12.1	Data Information	Contraceptive methods and core attributes.
F	12.2.1	Baseline Sample	Descriptive statistics. Proportion of women using each contraception method type by country and parity.
G	12.2.1	Baseline Sample	Descriptive statistics. Proportion of women reporting use of “other” contraceptive method by country, parity, and age.
H	12.2.1	Baseline Sample	Descriptive statistics: Proportion of women reporting each 3-year fertility intention by country and parity.
I	12.2.2	Restricted Sample	Descriptive statistics. Proportion of women using long-acting contraception as method type by country, parity, and age.
J	12.3.1	Baseline Sample	Multivariate results. Odds ratios of parity, age (continuous and squared), recent birth event, and highest educational level on the likelihood of using a specific contraceptive method type.
K	12.3.1	Baseline Sample	Multivariate results. Average marginal effects of parity on using a specific contraceptive method type.
L	12.3.2	Restricted Sample	Multivariate results. Odds ratios of parity, age (continuous and squared), recent birth event, and highest educational level on the likelihood of using a specific contraceptive method type.
M	12.3.2	Restricted Sample	Multivariate results. Average marginal effects of parity on using a specific contraceptive method type.

12. APPENDIX

12.1. Tables: Gender and Generations Survey

Table B: Survey collection details for GGS Round II Wave 1 datasets; countries of analysis.										
Survey Collection				Survey Collection			Sample Size			
Country	Start	End	Mode	Frame	Coverage	Method	Stratification	Starting	Target	Non-Response
DK	03/2021	06/2021	Web	Register	100%	SRS	Explicit	42,116	8,269	76%
NO	11/2020	12/2020	Web	Register	99%	SRS	None	15,000	5,374	60%
CZ	10/2020	07/2022	Face-to-Face; Web	Register	98%	SRS	Explicit	21,084	5,594	–
HR	05/2023	07/2023	Web	Register	100%	SRS	None	18,000	7,487	–
AT	10/2022	03/2023	Web	Register	99%	Stratified	Explicit	22,000	8,267	–
DE	2021	2022	Paper; Web	Register	100%	Multistage	None	108,256	22,048	65%
FR	09/2023	07/2024	Telephone; Web	Register	100%	SRS	Explicit	56,544	14,285	75%
NL	10/2022	11/2023	Web	Register	97%	Stratified	Implicit	27,152	8,078	75%
SRS is simple random sampling.										
Source: GGS Round II Wave 1, country-specific technical documents.										

Table C: List of variables used for analysis from the GGS Round II Wave I baseline questionnaire.			
Variable	Question	Condition	Response
dem01	What is your gender?		Male Female
dem02	When were you born?		[MM/YYYY]
dem07_isced	What is the highest level of education you have completed? Please select the education level that corresponds most closely to the highest level of education you have completed.		Early childhood Primary Lower secondary Upper secondary Post-secondary non-tertiary Short-cycle tertiary Bachelor or equivalent Master or equivalent Doctoral or equivalent
lhi26	Please indicate if {Child_#} is...	IF (total children > 0)	Biological child Adopted child Stepchild
lhi29	When was {Child_#} born?	IF (total children > 0)	[MM/YYYY]
fer01a	Are you currently pregnant?		Yes No Maybe, don't know yet
fer01b	Is your partner currently pregnant?		Yes No Maybe, don't know yet
fer06	Have you been sterilized or have you had an operation that makes it impossible for you to have a child/more children?	FER05 = “definitely not” OR FER05 = “probably not” NOT(FER01a = yes) age < 50	Yes No
fer09	Has your partner ever been sterilized or had an operation that makes it impossible for him/her to have a child/more children?	FER08 = “definitely not” OR FER08 = “probably not” BDEMOGRAPHICS.DEM21 = yes NOT(FER01a = yes) age < 50	Yes No
fer12	Are you or your partner using or doing any of these things to prevent pregnancy at this time? Please name all of the things you use or do.	NOT(FER01a = yes) age < 50	Condom Pills IUD Diaphragm/Cervical Cap Foam/Crema/Jelly/Suppository Injectables (e.g. Depo Provera)

Table C: List of variables used for analysis from the GGS Round II Wave I baseline questionnaire.		
Variable	Question	Response
	Condition	Implants (e.g. Norplant) Persona Hormonal Emergency Contraception Afterwards Withdrawal Safe Period Method (Rhythm) Vaginal Ring Female Condom
fer14	Do you intended to have a/another child during the next three years? Please take into account only biological children.	sex = female AND age <50 Definitely not Probably not Unsure Probably yes Definitely yes Currently expecting a child
<i>Note:</i> fer05 and fer05 asked respondents about the perceived fertility of themselves and, if applicable, their partner. <i>Source:</i> GGS Round II, Wave I, country-specific technical documents.		

Table D: Country-specific deviations in the reporting of “other” and “no” contraceptive methods in the GGS Round II Wave I; countries of analysis.			
Country	Code: 14	Code: 15	Country-Specific
<i>Nordic countries</i>			
Denmark	Other method	No contraception	3714: Other method; 3715: Does not use contraceptive methods
Norway	Other method	No contraception	–
<i>Central European countries</i>			
Croatia	Other method	No contraception	–
Czechia	None of the above	–	2814: No contraception
<i>German-speaking countries</i>			
Austria	Other method	No contraception	–
Germany	None of the above	–	1401: No contraception
<i>Western European countries</i>			
France	Other method	No contraception	–
The Netherlands	Other method	No contraception	–
<i>Source: GGS Round II Wave I, country-specific technical documents.</i>			

Table E: All contraceptive methods captured in the GGS-II, according to method type, effectiveness, and characteristics of use.						
Method Type	Contraceptive Method	Effectiveness ^(a)	Ranking ^(b)	Episodic	Duration ^(c)	Discontinuation
Short-Acting	Condom (Male)	13.0%	10	Episodic	–	User Dependent
	Condom (Female)	21.0%	14	Episodic	–	User Dependent
	Diaphragm/Cervical Cap	17–22.0%	11	Episodic	–	User Dependent
	Foam/Cream/Jelly Suppository	21.0%	13	Episodic	–	User Dependent
	Oral Pill	7.0%	6	Non-Episodic	Daily	User Dependent
	Persona	12.0%	8	Non-Episodic	Daily	User Dependent
	Withdrawal	20.0%	12	Episodic	–	User Dependent
	Safe Period Method (Rhythm)	15.0%	9	Episodic	–	User Dependent
	Vaginal Ring	7.0%	6	Non-Episodic	3 Weeks	User Dependent
Long-Acting	Implant	0.1%	1	Non-Episodic	3–5 Years	Practitioner Dependent
	Injectable	4.0%	5	Non-Episodic	1–3 Months	Time Dependent
	Intrauterine Device (IUD)	0.4–0.8%	4	Non-Episodic	7–12 Years	Practitioner Dependent
	Tubal Ligation (Female Sterilization)	0.5%	3	Non-Episodic	Lifelong	Not Possible
	Vasectomy (Male Sterilization)	0.2%	2	Non-Episodic	Lifelong	Not Possible
Other	None of the Above	–	–	–	–	–
	Other Method	–	15	–	–	–
	Hormonal Emergency Contraception	–	–	–	–	–
	Afterwards ('Plan B')	–	–	–	–	–
(a) Effectiveness: Measured according to typical use in the United States, the “percentage of users experiencing an unintended pregnancy within the first year of contraceptive use.” (Polis et al., 2026, p. 2) (b) Ranking refers to the order of assignment used for respondents when determining the most effective contraceptive method used. If a respondent reported using two methods of equivalent effectiveness, they were assigned the more common method according to their country and age. (c) Duration: Measured as the length of time that the method can reliably prevent pregnancy (Festini et al., 2016). Sources: Average duration of use (WHO Family Planning, 2022); Contraceptive effectiveness (Polis et al., 2026; Urrutia & Polis, 2023).						

12.2. Tables: Descriptive Statistics

12.2.1. Baseline Sample

Table F: Distribution (%) of baseline sample according to use of different contraceptive method types: long-acting, short-acting, and other.						
Country	Parity	N	Long-acting	Short-acting	Other	
<i>Northern European countries</i>						
Denmark	1	328	31.1	47.0	22.0	
	2+	1,160	56.9	29.0	14.1	
Norway	1	132	37.1	59.1	3.8	
	2+	604	59.3	32.9	7.8	
<i>Central European countries</i>						
Croatia	1	225	8.9	89.8	1.3	
	2+	536	23.3	74.6	2.1	
Czech Republic	1	197	12.2	71.1	16.8	
	2+	767	31.4	61.1	7.4	
<i>German-speaking countries</i>						
Austria	1	295	24.7	72.9	2.4	
	2+	691	48.9	45.6	5.5	
Germany	1	631	15.5	81.5	3.0	
	2+	1,577	20.4	76.4	3.2	
<i>Western European countries</i>						
France	1	312	42.0	53.8	4.2	
	2+	1,006	57.1	39.5	3.5	
The Netherlands	1	231	28.1	68.8	3.0	
	2+	827	46.1	45.9	8.0	
Baseline sample consists of women aged 25–49 who report use of any method of contraception. Source: GGS Round II, Wave 1, own calculations.						

Country	Parity	25–29 %	N	30–34 %	N	35–39 %	N	40–44 %	N	45–49 %	N
<i>Nordic countries</i>											
Denmark	1	7.2	69	12.6	103	31.1	61	41.7	48	31.9	47
	2+	10.6	47	11.6	172	12.8	266	12.2	304	18.3	371
Norway	1	0.0	30	5.1	39	9.7	31	0.0	16	0.0	16
	2+	4.5	22	7.3	96	7.7	143	10.5	172	5.8	171
<i>Central European countries</i>											
Croatia	1	0.0	33	0.0	54	0.0	46	1.7	59	6.1	33
	2+	0.0	25	0.0	64	1.4	139	2.5	161	3.4	147
Czech Republic	1	5.4	37	11.5	52	19.0	42	30.6	36	20.0	30
	2+	14.3	28	4.2	118	6.0	199	9.9	223	7.0	199
<i>German-speaking countries</i>											
Austria	1	0.0	45	0.0	65	7.8	64	1.9	54	1.5	67
	2+	0.0	28	4.0	101	5.0	181	6.1	179	6.9	202
Germany	1	3.1	64	3.1	161	3.6	139	2.6	152	2.6	115
	2+	2.3	44	2.4	212	3.5	400	3.1	524	3.5	397
<i>Western European countries</i>											
France	1	1.9	53	4.8	84	3.1	64	5.1	59	5.8	52
	2+	2.4	41	7.5	147	2.5	277	1.7	300	4.6	241
The Netherlands	1	2.6	39	1.4	69	3.7	54	3.3	30	5.1	39
	2+	4.8	21	6.3	142	5.8	225	11.5	243	7.7	196
Baseline sample. Percentages are calculated among women reporting any contraceptive use. The denominator includes long-acting, short-acting, and other contraceptive methods. N is the total number of women in the corresponding age group in the baseline sample. Source: GGS Round II, Wave 1, own calculations.											

Table H: Distribution (%) of women who report any contraceptive use according to 3-year fertility intention.					
Country	Parity	No	Unsure	Yes	N
<i>Nordic countries</i>					
Denmark	1	41.8	9.5	48.8	328
	2+	91.5	3.2	5.3	1,160
Norway	1	50.0	9.1	40.9	132
	2+	88.7	7.9	3.3	604
<i>Central European countries</i>					
Croatia	1	54.7	16.4	28.9	225
	2+	88.8	7.3	3.9	536
Czech Republic	1	50.3	18.8	31.0	197
	2+	93.5	3.9	2.6	767
<i>German-speaking countries</i>					
Austria	1	67.5	10.8	21.7	295
	2+	92.8	4.2	3.0	691
Germany	1	65.8	15.4	18.9	631
	2+	92.5	4.5	3.0	1,577
<i>Western European countries</i>					
France	1	58.7	15.1	26.3	312
	2+	90.8	6.0	3.3	1,006
The Netherlands	1	50.6	13.9	35.5	231
	2+	93.0	5.9	1.1	827
Baseline sample. Distribution in response to the question: "Do you intend to have <i>a/another [biological] child during the next three years?</i> " Original answers were on a 5-point Likert scale. Source: GGS Round II, Wave 1, own calculations.					

12.2.2. Restricted Sample

Table I: Proportion of women using long-acting contraception among women reporting any contraceptive use, by country, parity, and age; sample restricted to women who report no fertility intention within the next 3 years.									
Age	Parity 1 %	N	Parity 2+ %	N	Age	Parity 1 %	N	Parity 2+ %	N
<i>Nordic countries</i>									
DK	50.0	12	44.0	25	NO	25.0	8	64.3	14
25-29	33.3	18	54.2	120	25-29	44.4	9	52.5	61
30-34	45.8	24	56.2	242	30-34	35.3	17	51.6	124
35-39	34.2	38	57.1	303	35-39	68.8	16	65.9	167
40-44	44.4	45	64.4	371	40-44	68.8	16	66.5	170
45-49	40.9	137	58.8	1,061	45-49	51.5	66	61.2	536
$\bar{x}$					$\bar{x}$				
<i>Central European countries</i>									
HR	28.6	7	19.0	21	CZ	0.0	6	15.4	13
25-29	0.0	11	23.2	95	25-29	10.0	10	9.8	41
30-34	9.1	22	27.6	185	30-34	4.0	25	24.8	121
35-39	20.7	29	32.7	217	35-39	12.0	50	26.5	155
40-44	36.7	30	40.2	199	40-44	34.4	32	31.5	146
45-49	21.2	99	31.8	717	45-49	15.4	123	25.8	476
$\bar{x}$					$\bar{x}$				
<i>German-speaking countries</i>									
AT	20.0	10	28.6	21	DE	27.3	11	20.0	25
25-29	23.3	30	38.2	76	25-29	13.5	52	13.0	161
30-34	20.9	43	55.5	164	30-34	22.8	92	17.6	363
35-39	36.7	49	46.1	178	35-39	17.2	145	21.6	515
40-44	34.3	67	60.4	202	40-44	21.7	115	27.6	395
45-49	29.6	199	51.5	641	45-49	19.5	415	21.2	1,459
$\bar{x}$					$\bar{x}$				
<i>Western European countries</i>									
FR	83.3	12	53.8	26	NL	0.0	4	23.1	13
25-29	40.6	32	56.0	109	25-29	23.1	13	43.2	111
30-34	48.4	31	58.0	250	30-34	34.3	35	46.4	209
35-39	51.8	56	59.5	289	35-39	25.9	27	45.8	240
40-44	46.2	52	59.4	239	40-44	44.7	38	53.6	196
45-49	49.7	183	58.5	913	45-49	33.3	117	47.2	769
$\bar{x}$					$\bar{x}$				
Restricted sample consists of women who reported (definitely/probably) “no” to the question: “Do you intend to have a/another [biological] child during the next three years?”.									
Source: GGS Round II, Wave 1, own calculations.									

12.3. Tables: Results of Multivariate Regressions

12.3.1. Baseline Sample

Table J: Results of logistic regression of baseline sample: effect of parity, age (continuous and squared), recent birth event, and highest educational level on the likelihood of using a specific contraceptive method type.

Method	Region	Country	Parity: 2+ (ref: 1)	Age	Age ²	Birth Event	Education
Short-acting	Nordic	DK	0.415*** (0.156)	1.118*** (0.019)	0.999*** (0.000)	0.992*** (0.001)	0.985 (0.051)
		NO	0.426*** (0.210)	1.100*** (0.021)	0.998*** (0.000)	0.996* (0.002)	0.931 (0.055)
	Central	HR	0.388*** (0.251)	0.611*** (0.027)	1.006*** (0.001)	0.994** (0.002)	1.035 (0.056)
		CZ	0.361*** (0.140)	0.901*** (0.020)	1.001* (0.000)	0.994*** (0.002)	1.002 (0.039)
	German	AT	0.331*** (0.161)	0.675*** (0.017)	1.005*** (0.000)	0.994*** (0.001)	1.057 (0.041)
		DE	0.707*** (0.121)	0.938*** (0.014)	1.001 (0.000)	0.996*** (0.001)	1.146*** (0.035)
	Western	FR	0.544*** (0.138)	0.942*** (0.014)	1.001** (0.000)	0.996*** (0.001)	0.993 (0.035)
		NL	0.446*** (0.164)	0.914*** (0.018)	1.001** (0.000)	0.993*** (0.002)	0.969 (0.048)
Other	Nordic	DK	0.277*** (0.189)	1.348*** (0.024)	0.997*** (0.000)	0.994*** (0.002)	0.865* (0.062)
		NO	1.278*** (0.025)	1.878*** (0.043)	0.991*** (0.001)	1.000 (0.003)	1.124 (0.113)
	Central	HR	0.550*** (0.035)	0.984 (0.081)	1.001 (0.002)	1.001 (0.005)	1.081 (0.158)
		CZ	0.135*** (0.092)	1.080* (0.032)	1.000 (0.001)	0.988*** (0.003)	0.863* (0.065)
	German	AT	1.099*** (0.016)	2.228*** (0.041)	0.990*** (0.001)	1.000 (0.003)	0.924 (0.099)
		DE	0.697*** (0.023)	0.932* (0.034)	1.001 (0.001)	0.991** (0.003)	1.206* (0.080)
	Western	FR	0.603*** (0.014)	0.894** (0.034)	1.002 (0.001)	0.998 (0.003)	0.937 (0.089)
		NL	1.402*** (0.020)	1.140*** (0.035)	0.999 (0.001)	0.994 (0.003)	0.898 (0.088)

Baseline sample consists of women aged 25–49 who report use of any method of contraception

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Odds ratios. Reference Categories: Method Type (Long-Acting), Parity (Parity 1).

Source: GGS Round II, Wave 1, own calculations.

Table K: Average marginal effects (AMEs) of parity on using each contraceptive method type among women reporting contraceptive use.							
Method	Region	Country	N	Parity: 2+ (ref: 1)	95% CI		
Long-acting	Nordic	Denmark	1,488	***	0.305	0.217	0.394
		Norway	736	**	0.153	0.042	0.265
	Central	Croatia	761	***	0.083	0.041	0.126
		Czech Republic	964	***	0.173	0.114	0.232
	German	Austria	986	**	0.248	0.096	0.401
		Germany	2,208	*	0.040	0.007	0.073
	Western	France	1,318	***	0.152	0.073	0.230
		The Netherlands	1,058		0.094	-0.088	0.275
Short-acting	Nordic	Denmark	1,488		-0.016	-0.092	0.061
		Norway	736	***	-0.194	-0.309	-0.079
	Central	Croatia	761	***	-0.088	-0.131	-0.045
		Czech Republic	964	**	-0.122	-0.203	-0.042
	German	Austria	986	***	-0.309	-0.454	-0.164
		Germany	2,208	+	-0.037	-0.075	0.001
	Western	France	1,318	***	-0.151	-0.230	-0.071
		The Netherlands	1,058		-0.131	-0.311	0.050
Other	Nordic	Denmark	1,488	***	-0.290	-0.392	-0.188
		Norway	736		0.041	-0.040	0.121
	Central	Croatia	761		0.004	-0.003	0.012
		Czech Republic	964	+	-0.051	-0.109	0.007
	German	Austria	986	*	0.061	0.005	0.117
		Germany	2,208		-0.003	-0.026	0.020
	Western	France	1,318		-0.001	-0.036	0.034
		The Netherlands	1,058		0.037	-0.059	0.133
Baseline sample. AMEs represent differences in the predicted probability of using the specified contraceptive method for women of parity 2+ relative to parity 1.							
+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Age is modelled as a squared and continuous variable.							
Source: GGS Round II, Wave 1, own calculations.							

12.3.2. Restricted Sample

Table L: Results of logistic regression of restricted sample: Effect of parity, age (continuous and squared), recent birth event, and highest educational level on the likelihood of using a specific contraceptive method type.

Method	Region	Country	Parity: 2+ (ref: 1)	Age	Age ²	Birth Event	Education
Short-acting	Nordic	DK	0.522** (0.222)	1.186*** (0.023)	0.998*** (0.000)	0.993*** (0.002)	0.963 (0.058)
		NO	0.571* (0.277)	1.054* (0.025)	0.999* (0.001)	0.998 (0.002)	0.942 (0.061)
	Central	HR	0.480** (0.260)	0.823*** (0.028)	1.002*** (0.001)	0.994** (0.002)	1.003 (0.056)
		CZ	0.557*** (0.177)	0.972 (0.022)	1.000 (0.001)	0.994*** (0.002)	0.985 (0.041)
	German	AT	0.316*** (0.180)	0.705*** (0.019)	1.004*** (0.000)	0.995*** (0.001)	1.087 (0.044)
		DE	0.746* (0.137)	0.996 (0.016)	1.000 (0.000)	0.996*** (0.001)	1.142*** (0.036)
	Western	FR	0.653* (0.168)	1.062*** (0.017)	1.000 (0.000)	0.997* (0.001)	0.989 (0.039)
		NL	0.452*** (0.205)	0.999 (0.021)	1.000 (0.000)	0.993*** (0.002)	0.940 (0.051)
Other	Nordic	DK	0.339*** (0.237)	1.075** (0.027)	1.000 (0.001)	0.995*** (0.002)	0.865* (0.068)
		NO	4.503*** (0.010)	1.811*** (0.051)	0.992*** (0.001)	1.002 (0.003)	1.272 (0.135)
	Central	HR	0.571*** (0.038)	0.940 (0.080)	1.001 (0.002)	1.000 (0.005)	1.076 (0.158)
		CZ	0.170*** (0.107)	1.051 (0.037)	1.001 (0.001)	0.987*** (0.003)	0.853* (0.071)
	German	AT	1.033 (0.019)	3.781*** (0.047)	0.984*** (0.001)	1.001 (0.003)	0.937 (0.105)
		DE	0.830*** (0.019)	1.349*** (0.041)	0.997** (0.001)	0.992** (0.003)	1.134 (0.089)
	Western	FR	0.593*** (0.016)	0.846*** (0.041)	1.003** (0.001)	0.998 (0.004)	0.981 (0.103)
		NL	1.301*** (0.030)	0.946 (0.036)	1.002 (0.001)	0.993* (0.003)	0.862 (0.090)

Restricted sample consists of all women who reported use of any contraceptive method and responded (definitely/probably) “no” to the question: “Do you intend to have a/another [biological] child during the next three years?”.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Odds ratios. Reference Categories: Method Type (Long-Acting), Parity (Parity 1).

Source: GGS Round II, Wave 1, own calculations.

Table M: Average marginal effects (AMEs) of parity on using each contraceptive method type among women reporting contraceptive use and reporting no short-term fertility intention.

Method	Region	Country	N	Parity 2+ (ref: 1)	95% CI
Long-acting	Nordic	Denmark	1,198	***	0.161
		Norway	602		0.355
	Central	Croatia	599	**	-0.060
		Czech Republic	816	**	0.065
	German	Austria	840	**	0.036
		Germany	1,874	+	0.050
	Western	France	1,096		-0.003
		The Netherlands	886		-0.043
Short-acting	Nordic	Denmark	1,198		-0.138
		Norway	602	*	-0.098
	Central	Croatia	599	**	-0.318
		Czech Republic	816		-0.282
	German	Austria	840	***	-0.178
		Germany	1,874	+	-0.415
	Western	France	1,096		-0.085
		The Netherlands	886		-0.197
Other	Nordic	Denmark	1,198	***	-0.338
		Norway	602	*	-0.356
	Central	Croatia	599		0.021
		Czech Republic	816		-0.007
	German	Austria	840	*	-0.190
		Germany	1,874		0.004
	Western	France	1,096		-0.024
		The Netherlands	886	*	-0.034
Restricted sample consists of all women who reported use of any contraceptive method and responded (definitely/probably) "no" to the question: "Do you intend to have <i>another [biological] child during the next three years?</i> ".					
AMEs represent differences in the predicted probability of using the specified contraceptive method for women of parity 2+ relative to parity 1.					
+ <i>p</i> < 0.10, * <i>p</i> < 0.05, ** <i>p</i> < 0.01, *** <i>p</i> < 0.00. Age is modelled as a squared and continuous variable.					
Source: GGS Round II, Wave 1, own calculations.					