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# Moving Closer for the Grandchild? Fertility and the Geographical Proximity of a Mother and Her Adult Daughter in a Dynamic Perspective

Roberta Rutigliano, Christine Schnor, and Zuzana Zilincikova

**ABSTRACT** Recent research has analyzed how the geographical distance between mothers and adult daughters influenced the daughters' fertility transitions. The inverse relationship has received less attention: that is, whether a daughter's fertility—her pregnancies and the ages and number of her children—is affected by her geographical proximity to her mother. The current study helps to close this gap by considering moves by either adult daughters or mothers that lead them to live nearby again. We use Belgian register data on a cohort of 16,742 firstborn girls aged 15 at the beginning of 1991 and their mothers who lived apart at least once during the observed period (1991–2015). Estimating event-history models for recurrent events, we analyzed whether an adult daughter's pregnancies and the ages and number of her children affected the likelihood that she was again living close to her mother and, if so, whether the daughter's or the mother's move enabled this close living arrangement. The results show that daughters were more likely to move closer to their mothers during their first pregnancy and that mothers were more likely to move closer to their daughters when the daughters' children were older than 2.5 years. This study contributes to the growing literature investigating how family ties shape (im)mobility.

**KEYWORDS** Grandparenting • Belgium • Cox model • Life course • Register data

## Introduction

Geographical proximity represents a good proxy for factors that have been used to conceptualize the strength of the parent–child relationship, such as the frequency of contact, the amount of intergenerational support, and the perceived degree of closeness (for a more detailed discussion, see Kalmijn et al. 2019). Parent–child geographical proximity fosters face-to-face contact (Grundy and Shelton 2001; Hank 2007), increases the likelihood that the parent provides support (Knijn and Liefbroer 2006), and discourages the adult child from moving far away (e.g., Ermisch and Mulder 2019). Although new communication technologies allow distant family members to maintain affective ties, parents and their daughters might live or move closer to feel connected to each other (Fingerman et al. 2020). For instance, when an adult child

wants or needs parental proximity during their childbearing and child-rearing years, the parent and adult child may be motivated to move closer to each other (Michielin et al. 2008; Pettersson and Malmberg 2009).

Considering a perspective that views family ties as crucial factors in (im)mobility decisions (Mulder 2018), we investigate the conditions under which an adult daughter and her mother move to be close to each other during the adult daughter's reproductive years. We focus on the mother–daughter dyad because it maximizes the association between fertility and mobility within the extended family network. First, the impact of childbearing and child-rearing is greater for an adult daughter than for an adult son (Benard and Correll 2010; Liefbroer 2005). Second, women remain the main caregivers within the family network (Bianchi et al. 2012; Fingerman et al. 2020; Furstenberg 2020). Thus, the mother–daughter dyad is usually the strongest of parent–child ties in terms of intergenerational exchanges (Swartz 2009). Third, women are more likely than men to move for family reasons (Gillespie and Mulder 2020). Thus, the mother–adult daughter dyad also has the highest likelihood of mobility events. Furthermore, because the mother generally serves as a kin keeper (Fingerman 2001; Kalmijn 2007), moving closer to the mother may provide access to other extended family members (Kalmijn et al. 2019). Fourth, an adult daughter's transition to motherhood brings new roles within the family (as does an adult son's transition to fatherhood; in each case, the phenomenon of role identification connects the child with their respective role model). When an adult daughter becomes a mother and her mother becomes a grandmother, the daughter may feel happier when her mother is close by (Arber and Timonen 2012). The mother often enjoys supporting her daughter by providing psychological support or grandparental childcare and spending time with the grandchildren (Mueller et al. 2002). Finally, women's fertility histories are more reliable than men's (e.g., Joyner et al. 2012).

This study contributes to the growing literature on the role of family ties in shaping (im)mobility by considering mothers' and daughters' mobility perspectives and by focusing on the specific life course effects of childbearing and child-rearing phases on the geographical proximity of mothers and their adult daughters. Specifically, we analyze how the geographical closeness of an adult daughter and her mother might change in response to, or even in anticipation of, the daughter's pregnancies or the ages and number of her children.

Most research on this topic has focused primarily on only one generation's moves: the adult child's (e.g., Michielin et al. 2008; Pettersson and Malmberg 2009). Few studies have examined parents' moves (van Diepen and Mulder 2009). In some cases, one person's needs and preferences might trigger a move by either the person in need or the potential provider of emotional and instrumental support. Properly addressing these dynamics requires us to study the adult daughter's and her mother's mobility jointly. To our knowledge, only one study considered both parent and child perspectives in analyzing the relationship between fertility and proximity. Smits (2010) analyzed the moves of both parents and their adult children that occurred within 12 months of various life course events, such as a separation, marriage, or recent birth. However, this study did not consider the impact of repeated events, such as a first versus higher order childbirth, and it did not provide a life course analysis of mobility in response to demographic events (Smits 2010).

Adopting a longitudinal approach is essential because mother–daughter and grandmother–grandchild relationships change and evolve with age (Mueller and Elder 2003; Silverstein and Marengo 2001). Furthermore, the mother’s and daughter’s needs and preferences might change with the birth of each (additional) child and over time (Silverstein and Marengo 2001), and their geographical proximity might change in response to, and in anticipation of, the daughter’s fertility (Kulu and Steele 2013; Pink 2018; Vidal et al. 2017). Finally, the mother’s and daughter’s individual circumstances over the life course might make it easier or harder for them to move closer to each other. Thus, a better understanding of the role of family ties during childbearing and child-rearing phases requires examining mothers’ and their adult daughters’ geographical proximity through a life course perspective.

Taking advantage of full population data for 1991–2015 from Belgium, we constructed a longitudinal data set following daughters from their teenage years to age 39. We follow 16,742 dyads consisting of a mother and her first daughter as they enter our observational window after having lived in different municipalities. By adopting a longitudinal approach, we can differentiate in more detail than prior research the various phases of the daughter’s childbearing and child-rearing. Specifically, we distinguish the following five *childbearing and child-rearing phases*: childlessness; the year before the first conception; first versus higher order pregnancies; and having one or more children of toddler ages (0–2.49 years), kindergarten ages (2.5–6 years), and school ages (7+ years). Using event-history models for recurrent events, we analyze the relationships between the daughter’s childbearing and child-rearing phases and moves that increased the geographical proximity of the mother and the daughter. In the first step, we consider close geographical proximity as the outcome of the adult daughter’s or the mother’s joint mobility, regardless of who moved. In the second step, we investigate whether these dynamics differed depending on whether the mother or her adult daughter moved. Thus, we analyze separately whether the daughter’s childbearing and child-rearing phases increased the likelihood that (1) the mother moved to the municipality where her adult daughter was living or (2) the adult daughter moved to the municipality where her mother was living.

## Background

### The Mother–Adult Daughter Dyad

The mother–child relationship has been considered one of the strongest and long-lasting ties in an individual’s life (Bengtson 2001; Birditt et al. 2019; Fingerman et al. 2020). With some variation across family types and cohorts (Fischer and Kalmijn 2021), most adult children maintain contact with their mothers, despite the possible conflicts arising from such relationships (Fingerman 2001; Gilligan et al. 2015; Reczek and Bosley-Smith 2021). Relative to fathers, mothers are generally more involved in intergenerational relationships and exchanges (Choi et al. 2020; Suitor and Pillemer 2007; Swartz 2009). Although the frequency of mothers’ contact with adult daughters is higher than that with adult sons (Fingerman 2001; Fingerman et al. 2020), mothers provide instrumental and emotional support to their offspring regardless of their gender (Fingerman et al. 2020; Gilligan et al. 2015; Suitor et al. 2008).

However, the birth of a child has a greater impact on the adult daughter's life than on the adult son's (Nomaguchi and Milkie 2020).

First, during their transition to motherhood, daughters reorder their relationship with their mothers in light of their new roles as mother and grandmother, respectively (Fischer 1981). The daughter consciously or unconsciously connects with her mother as a role model for her own mothering style (Bojczyk et al. 2011; Shrier et al. 2004). This reordering might lead to estrangement, but in most cases, it will increase the strength and importance of their bond (e.g., Blaauboer 2011). After childbirth, the adult daughter increases the number of daily contacts and exchanges with her mother to establish continuity of this tie for herself and for her children (Fischer 1981). Mothers and adult daughters who live far from each other increase mutual daily phone contact, and adult daughters report the desire to have their mothers live nearby (Fischer 1981). Mothers are often willing and excited to take up their new grandmother role and to spend time with their grandchild (Arber and Timonen 2012). Thus, a mother's relationship with the adult daughter is reinforced by increasing exchanges with the grandchild(ren) (Mueller and Elder 2003; Mueller et al. 2002).

Second, the adult daughter's transition to motherhood represents a period of increasing need for instrumental support. Women often need more support than men in the transition to parenthood because of the unequal division of paid and unpaid work (Nomaguchi and Milkie 2020). Mothers still tend to do most of the childcare and household chores, often while trying to reconcile these responsibilities with paid work (Nomaguchi and Milkie 2020). Because of the same mechanism, grandmothers tend to be more involved than grandfathers in raising their grandchildren (Hank and Buber 2009; Thomese and Liefbroer 2013). Thus, the mother–adult daughter dyad represents a special tie for which the need for support and the likelihood of receiving that support is maximized.

Furthermore, women seem to give more importance to geographical proximity to other kin than men (Niedomysl 2008). For women, proximity to other family members seems to be a reason to move (Gillespie and Mulder 2020) or to stay (Clark and Lisowski 2017; Palomares et al. 2017). Thus, focusing on the mother–daughter dyad maximizes the likelihood of observing mobility events. In addition, women tend to be the kin keepers (Fingerman 2001; Kalmijn 2007), charged with maintaining family ties (Fingerman 2001; Fingerman et al. 2020; Swartz 2009). For instance, when a couple has children, the adult daughter's family ties become more important than her partner's (Blaauboer 2011). Therefore, the spatial distribution of the extended family network often develops around the new grandmother's position (Daw et al. 2019; Kolk 2017). Focusing on the adult daughter's moves toward her mother might then obscure her intentions of also moving closer to other family members, such as a father or siblings.

These findings suggest that the mother–daughter dyad plays a key role in the provision and receipt of emotional and instrumental support during the transition to parenthood and child-rearing (Rutigliano 2020; Thomese and Liefbroer 2013; Zhang et al. 2019). In this life stage, the daughter's mother is an especially important resource because of the uniqueness of the relationship and the changing circumstances. Thus, a mother and her daughter might be expected to benefit the most from living close to each other. Indeed, they are the most likely family dyad to move closer to each other. For these reasons, we focus on the mother–adult-daughter dyad in this study.

## Mobility and the Impact of Moving for Mothers and Their Adult Daughters

Individuals might choose to move for economic reasons, such as to take a new job. Alternatively, they might move for personal reasons related to life course events, such as moving in with a new partner, separation from a partner, the birth of a child, their children leaving home, or retirement (Choi et al. 2020; Fingerman et al. 2011). In these personal and economic circumstances, parents might provide a safe harbor to their adult children (Fingerman et al. 2015). Thus, for the adult child, moving to be closer to their parents (Araos and Siles 2021; Coulter et al. 2013) or returning to their parents' home (Albertini et al. 2018; Arundel and Lennartz 2017) might alleviate the negative consequences of specific life events or magnify the positive ones (Das et al. 2017).

Studies analyzing geographical (im)mobility over the life course follow the theory of location-specific capital accumulation (DaVanzo 1981), which posits that people who have lived in the same place for a long time will be less likely to move in the future. As time goes by, their network grows, and an increasingly large part of their identity is attached to their community (DaVanzo 1981). Thus, the cost of leaving becomes higher over time. These mechanisms can be extended to the literature about parent–child mobility (for an overview, see Vidal and Huinink 2019): adult children display greater geographical mobility at younger ages—for instance, as they transition to adulthood (Kalmijn 2006), when they are childless, or they have been already more mobile than the average population—than when they are a bit older and start building their families (e.g., Vidal et al. 2017). Conversely, parents have lower mobility, which may either increase or decrease after retirement (Kolk 2017).

With some contextual variation (e.g., Glaser and Tomassini 2000), family ties are part of location-specific social capital, given that they represent an important factor for individual well-being. Furthermore, the family usually represents the main network around which individuals develop their identity and on which they rely for instrumental and emotional support (Fingerman et al. 2020). Family ties might explain why most individuals remain close to their family members over their life course (Coulter et al. 2013; Kolk 2017). Individuals will decide to move only if the benefits of moving outweigh the negative consequences of leaving (Coulter et al. 2013). However, when mobility is associated with an urgent need for support, those who move tend to be new mothers needing childcare help (Smits 2010) and old parents needing assistance (Artamonova et al. 2020). Thus, the will to live closer and the need for emotional or instrumental support might moderate the logic of the location-specific capital accumulation hypothesis.

## The Adult Daughter's Fertility and Mother–Daughter Mobility: A Dynamic Approach

One set of studies has investigated fertility dynamics as predictors of residential relocation (e.g., Kulu and Steele 2013; Vidal et al. 2017). Another set of studies has investigated the proximity of mothers and their adult daughters either (1) in general terms, without focusing on specific life events (Choi et al. 2021; Kolk 2017); or (2) while examining life course events but without considering the long-term aspects of these events or a specific focus on fertility (Michielin et al. 2008; Smits 2010).

Although the desire to live close to kin is an important variable in many studies on mobility (e.g., Spring et al. 2017), studies concentrating on mother–daughter mobility over different phases of the adult daughter’s childbearing and child-rearing years are much rarer than studies on residential relocation and fertility in general. Therefore, to explain the current evidence on the relationship between a mother’s and her adult daughter’s proximity at different phases of childbearing and child-rearing and to formulate hypotheses, we combine findings from these three streams of literature.

### *Childless Daughters Versus Daughters With Children*

Several studies have investigated women’s mobility over the life course and have considered their fertility and number of children as important variables (e.g., Ermisch and Mulder 2019; Vidal et al. 2017). A general finding is that childless women tend to be more mobile than mothers (Clark 2013; Michielin and Mulder 2007). The difference between these groups in their likelihood of moving to be closer to their parents is particularly large when the children are older than 3 (Michielin et al. 2008) or 4 (Smits 2010) and younger than 15 (Ermisch and Mulder 2019). Given their generally higher mobility and their lower accumulation of location-specific capital, we expect the following:

*Hypothesis 1:* A childless adult daughter will be more likely to move closer to her mother than an adult daughter with children.

### *Entry Into Pregnancy and Motherhood*

The fertility and mobility literature has shown that adult daughters’ likelihood of moving increases during pregnancy and in the first months after childbirth (Kulu 2008; Kulu and Steele 2013; Vidal et al. 2017). A study on fertility and mobility synchronicity analyzed U.S. couples’ moves from 6 months before a childbirth to 18 months after it, finding that couples who moved while pregnant moved primarily because of the upcoming childbirth (Clark and Withers 2009). The literature on residential mobility has reported similar findings: couples are most likely to move in the fourth and fifth months of their first pregnancy (Kulu and Steele 2013). A study conducted in Germany analyzed the influence of individuals’ fertility intentions and pregnancies on their likelihood of moving within the same town, moving a short distance, or moving a long distance (Vidal et al. 2017). Using a competitive-risk model for the three potential destination types, these authors found that individuals who expressed their intention to have another child or were expecting a child were more likely than others to move to one of the destinations. Thus, individuals move in response to both pregnancy and future fertility plans.

By contrast, little is known about how the daughter’s fertility affects the mother’s mobility or proximity to the daughter. Nevertheless, literature on grandparental support has found that a mother may retire early in anticipation of becoming a grandmother (Van Bavel and De Winter 2013) and when she has grandchildren of any age (Svensson et al. 2015). Thus, mothers seem to be responsive to their grandparental

role regardless of their grandchildren's ages and may move closer to their grandchildren if their health status allows them to do so (Pettersson and Malmberg 2009). We thus expect the following:

*Hypothesis 2:* A mother is more likely to move to be closer to her adult daughter if the daughter has children than if the daughter is childless.

### *Age and Number of Children*

Adult daughters' mobility behavior varies depending on the ages and number of their children. The cost or penalty for moving increases with their children's ages (Smits 2010). A child's age reflects the child's independence and external commitments, such as school. Once the child of an adult daughter is older than 1 year, her likelihood of moving to be closer to her parents decreases unless a new and urgent need (e.g., a divorce/separation) emerges (Smits 2010). Further, an adult daughter's number of children is negatively associated with her mobility (Kulu 2008). Thus, we expect to find that:

*Hypothesis 3:* An adult daughter with one child or with preschool-age children is more likely to move closer to her mother than an adult daughter with more than one child or with school-age children.

Conversely, one study found that parents are more likely to move to be close (within 10 kilometers) or very close (within 1 kilometer) to their adult child if their grandchildren are older than 1 year than they are if they have no grandchildren (Smits 2010). Moreover, depending on the mother's life stage or circumstances (e.g., years left before retirement or partnership status), the likelihood that she and her adult daughter will move closer to each other at different childbearing and child-rearing phases might differ. In light of the sparse literature regarding mothers' mobility, we explore a final hypothesis:

*Hypothesis 4:* A mother whose adult daughter has more than one child or has school-age grandchildren is more likely to move closer to her daughter than a mother whose daughter has only one child or whose daughter has a toddler.

### **The Belgian Context**

Belgium represents an interesting context for studying the relationship between fertility and parental/grandparental support. In Belgium, female labor force participation has been around 48–50% since 2015 (World Bank 2023). Moreover, the full-time employment rate for women aged 20–64 is approximately 61–65% (Eurostat 2023), which is fairly close to the European Union average (European Commission et al. 2016). Statutory maternity leave has a maximum length of 15 weeks<sup>1</sup> and is paid at a low flat rate (Koslowski et al. 2021). Thus, women in Belgium tend to return to work

<sup>1</sup> See [https://www.oecd.org/els/soc/PF2\\_1\\_Parental\\_leave\\_systems.pdf](https://www.oecd.org/els/soc/PF2_1_Parental_leave_systems.pdf).



quickly after having a child. Although Belgium has reached the Barcelona target of providing childcare for at least 50% of preschool children (Wood and Neels 2019), children younger than 2.5 years do not have any legal entitlement to a place in the public childcare system. Thus, early childcare is not affordable and accessible for all Belgian families, and informal childcare likely compensates for insufficient early childcare in the public sector (Wood and Neels 2019). However, children 2.5 years or older can attend public school for free. Nonetheless, parents of school-age children have to cover extended school holiday periods, supervise their children's homework, and organize their children's extracurricular activities.

Grandparental care can help parents balance work and family, especially when early childcare is not affordable because of limited parental resources. Approximately 40% of Belgian working mothers with children younger than 6 years use grandparents as their main childcare providers (Jappens and Van Bavel 2012). A recent study investigating the relationship between formal and informal childcare provision in Belgium tested the extent to which the demand for informal childcare is driven by a lack of formal childcare (Biegel et al. 2021). The results showed that even in areas where formal childcare availability is high, informal childcare is still used as a complementary childcare arrangement. These findings point to the importance of grandparental childcare for Belgian families, even when they have access to formal childcare. In areas where formal childcare availability is high, informal childcare is more prevalent, but the intensity of the informal childcare provision (i.e., hours provided) is lower (Biegel et al. 2021). This evidence is in line with findings of previous European studies, which also reported that there is a trade-off between the prevalence and the intensity of informal care (e.g., Hank and Buber 2009).

## Data and Methods

### Data

We use information from DEMOBEL (1991–2015), a longitudinal data set containing demographic and mobility microdata from Belgian population registers provided by Statistics Belgium.<sup>2</sup> We also use data from the 1991 and 2001 censuses. DEMOBEL provides date-precise information on births, deaths, residential moves, household composition, and marital status for the entire Belgian population. The data include records of all registered residential moves: including moves within the same municipality, moves between municipalities, moves abroad, and moves from abroad. The data on residential moves include information on the municipality or country of origin and destination, as well as the date of the move. For move distance, we have information only on the distance between town halls of different municipalities. Moves within two municipalities are coded as a constant distance, moves within the same municipalities are all coded as zero distance, and moves abroad are missing distance. In some cases ( $n=589$  in our sample), the register loses track of the daughter or the mother—for example, if a person moves but fails to report the move to the

<sup>2</sup> See [https://statbel.fgov.be/sites/default/files/files/documents/bevolking/Demobel\\_EN.pdf](https://statbel.fgov.be/sites/default/files/files/documents/bevolking/Demobel_EN.pdf).

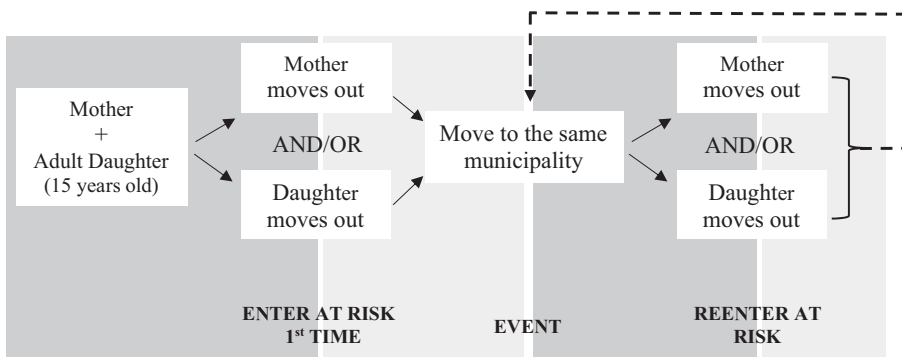


Fig. 1 Representation of the model risk set for repeated events

authorities. If the authorities cannot locate the individual, the administration strikes the individual from the register. An individual reappears in the register after registering again with a municipality. In such cases, we disregard the date when a person was struck from the register and instead consider the date when the person next registered with a municipality as the date of the move.

### Sample Selection

The unit of analysis is the mother–adult daughter dyad. We have selected the dyads on the basis of several criteria. First, we focus on all daughters in the register who turned 16 years old in 1991 and were living with their mothers at age 16. This age selection allows us to observe the adult daughters’ fertility biographies (from ages 16 to 39). Second, we include only daughters who were their mother’s first child (49% of the initial sample), randomly selecting one daughter in cases of twins or triplets. Third, mothers and daughters enter the population at risk of moving closer as soon as they are no longer living in the same municipality (see Figure 1). We exclude mother–daughter dyads who never moved away from each other ( $n=4,427$ ; 20% of the sample).<sup>3</sup> We omit immigrants (roughly 5% of the sample) owing to incomplete information on their moves, their fertility, and their mothers’ moves. The final sample consists of 16,742 mother–adult daughter dyads who lived in different municipalities at least once during the observed period.

### The Dependent Variable: Moving Closer to Each Other

Our dependent variable is whether the mother or the daughter made a residential move that led them to live close to each other. We define the dependent variable as

<sup>3</sup> To provide information on the selectivity of the dyads included in the analysis, we estimated selection into living apart as a function of the daughter’s and mother’s characteristics. Model results are provided in Table A3 (all tables and figures designated with an “A” are available in the online appendix).

moving to the same municipality because we believe this measure is more accurate and informative than an arbitrary minimum distance between two municipalities. Belgium is a small country that can be crossed by car in two to three hours. It counts 581 municipalities with an average area of 52 square kilometers and an average density of 773 inhabitants per square kilometer (Statistics Belgium 2015). The distance between municipalities ranges from 0 to 284 kilometers, with a mean of 90 kilometers and a median of 83 kilometers.<sup>4</sup> The size of the country and its division into French-speaking and Dutch-speaking areas contribute to short moving distances because people stay in their language communities (for a detailed discussion, see Schnor and Mikolai 2020). Thus, defining the dependent variable as a minimum distance between municipalities, such as 15 kilometers, would omit several moves from the risk window and reduce the number of observed events.

All moves result from one of three possibilities: (1) the daughter moved to her mother's municipality, (2) the mother moved to her daughter's municipality, or (3) both the mother and the daughter moved at the same time to a third municipality. In the first set of models, our dependent variable equals 1 if the daughter and mother were again living in the same municipality because either or both moved. In a second set of models, we define our dependent variable separately for mothers and their adult daughters: we analyze the likelihood of the daughter moving to her mother's municipality separately from the likelihood of the mother moving to her daughter's municipality. In both sets of models, we account for repeated events. Once the mother and the daughter were living in the same municipality, they left the risk population. They reentered the risk set if they later moved apart (see Figure 1).

### Main Predictors: Fertility History and Control Variables

We face several challenges in accurately modeling different phases of the adult daughter's childbearing and child-rearing. First, as explained earlier, moves might have occurred either in anticipation of fertility events or in response to them. To account for both possibilities, our dependent variable needs to cover the periods before and after childbirth. Our dependent variable models the year before, the year of, and the years following pregnancy. Second, fertility is a repeatable event. Our dependent variable includes a reference to parity-specific transitions. Children's support needs—and their entitlement to public education under Belgian law—vary depending on their age. To account for these characteristics, we construct a time-varying variable for modeling childbearing and child-rearing phases with the following categories: childless, one year before first pregnancy, first pregnancy, higher order pregnancy, first child aged 0–2.49 years, higher order child younger than 2.5 years, youngest child aged 2.5–6 years, and youngest child aged 7+ years.

We include *age* for adult daughters and mothers. The age categories for adult daughters are 16–23, 24–29, 30–35, and 36–39. The age categories for mothers are younger than 49, 49–59, and 60 or older.

<sup>4</sup> A distance of 0 kilometers means that two municipalities' town halls were less than 1 kilometer apart, which applied to only one case (Molenbeek-Saint-Jean and Koekelberg located in Brussels).

We calculate the *distance* between the mother and the daughter before an eventual move as the logged distance between their respective town halls because of the skewed distribution of this variable. If the adult daughter, the mother, or both moved abroad, we assume that the distance was greater than any distance between two points in Belgium, imputing this distance with a value of 1,000 kilometers.

To measure the mother's and daughter's *union status*, we include for each a time-varying dummy variable equal to 1 if the individual was in a residential partnership and 0 otherwise. To examine *family structure*, we link time-variant information about the adult daughter's number of siblings with the siblings' number of children. Here, we aim to measure possible conflicts or competing time constraints for a mother with other adult children, grandchildren, or both. The variable is built from the mother's perspective and is categorized as no other children, other children but no grandchildren, and other children with grandchildren.

We include a control for *prior experience living apart* because these individuals might have been more mobile than average. This variable equals 0 for the first episode of living apart (i.e., in a different municipality) and 1 for dyads again at risk of moving closer to each other (i.e., they moved apart after living in the same municipality).

*Mother's educational level* is measured by the census using the following categories: lower secondary, higher secondary/postsecondary, and tertiary. Although this information is available only every 10 years when the censuses were conducted (i.e., in 1991, 2001, and 2011), it seldom changed over time for the mothers. Thus, we use the information on the mother's educational level in 1991. If the information is missing for this year, we use the information from 2001. For each adult daughter, we have a measure of her educational level at ages 15, 25, and 35. Because we cannot construct a truly time-varying measure of the daughter's education, we do not include the daughter's education in the models. For similar reasons, the information on other socioeconomic characteristics (e.g., employment or housing) is available only every 10 years. Our cohort design therefore does not allow us to include these characteristics in the model.

### The Model: An Event-History Approach

We implement an event-history model for recurrent events. Event-history models allow us to discern how (upcoming) fertility events and subsequent child-rearing phases could trigger the mother's and the adult daughter's mobility and how their sociodemographic characteristics shaped this relationship. Given the accuracy of dates (measured in days) in the DEMOBEL, we employ a continuous-time event-history approach using Cox models for recurrent events (Cox 1972).

A mother and her daughter became at risk of moving to the same municipality the moment one of them moved away from the other (see Figure 1). Within the observation window, the individuals could move closer or farther from each other several times. Observations are censored at the earliest of the following events: the mother's death, the daughter's death, or January 1, 2015.

We first run a joint model on the mother's and daughter's geographical convergence that does not distinguish whether it was the mother or the daughter moving to the other's municipality. The dependent variable measures the waiting

time until the adult daughter, the mother, or both moved to the same municipality. This specification (Model a) investigates the fertility phase at which the mother and the daughter were more likely to be living in the same municipality again. However, in this joint model, we cannot distinguish whether the results are driven by the mother's or the daughter's mobility. Therefore, we run two separate Cox models—one for the adult daughter's mobility (Model b) and another for the mother's mobility (Model c)—to provide a more comprehensive accounting of the proximity dynamics from both perspectives. For Model b, the dependent variable measures the waiting time between the mother and daughter first moving apart and the daughter moving to her mother's municipality. For Model c, the dependent variable measures the waiting time between the point when the mother and the daughter first moved apart and the point when the mother moved to her daughter's municipality.

Formally, the hazard of moving to the other individual's municipality for each of these specifications can be defined as

$$h(t, \mathbf{X}) = h_0(t) \exp\left\{\sum_{i=1}^q \beta_i \mathbf{X}_i\right\}.$$

Here,  $h_0(t)$  is the baseline hazard, specified as the number of days since the mother and daughter moved apart.  $\mathbf{X}$  represents the vector of the covariates we include in the model, and  $\beta$  are the regression coefficients.

We implement different specifications of nested models to simplify comparisons of the results across models. Specifically, Model 1 includes only information on the daughter's childbearing and child-rearing phases, thus measuring the gross impact of childbearing and child-rearing on mother–daughter proximity. Model 2 additionally controls for prior experience of living in a different municipality to account for the impact of individuals who were more mobile than average. In Model 3, we add the logged move distance, the mother's partnership status, the mother's and daughter's age categories, the mother's educational level, and the variable for family structure to evaluate whether these characteristics might explain the possible impact of the daughter's childbearing and child-rearing on mother–daughter proximity. Finally, Model 4 adds the daughter's union status, a complex and important variable. On the one hand, because the daughter's union status is highly correlated with childbearing, it can be considered a bad control (Elwert and Winship 2014). On the other hand, if the daughter separated or divorced, this variable might be seen as a good indicator of the daughter's need for her mother's support. For these reasons, we include daughter's union status separately in the last model specification. All standard errors are corrected for the dyadic-level clustered structure of the data.

## Results

### Descriptive Results

Table 1 illustrates the number of observations and person-years for each time-constant and time-varying independent variable. Table 2 shows the number of events

**Table 1** Descriptive statistics for time-invariant and time-variant variables

		Number/Person-Years	%
<b>Time-Invariant Variable</b>			
Number of moves	First moving episode	107,594	73
	Repeated moving episode	40,293	27
<b>Time-Varying Variables</b>			
Daughter's childbearing and child-rearing phases	Childless	48,325	33
	One year before 1st pregnancy	8,296	6
	First pregnancy	6,735	5
	Higher order pregnancy	17,160	12
	First child aged 0–2.49 years	5,227	4
	Higher order child aged 0–2.49 years	13,400	9
	Youngest child aged 2.5–6 years	29,802	20
	Youngest child aged 7+ years	18,943	13
Daughter's age	16–23	15,980	11
	24–29	53,971	36
	30–35	55,575	38
	36+	22,361	15
Mother's age	<49	38,910	26
	49–59	82,097	56
	60+	26,880	18
Distance between mothers and daughters	≤10 kilometers	57,242	39
	>10 and ≤50 kilometers	66,632	45
	>50 and ≤240 kilometers	16,716	11
	Mother or daughter lives abroad	7,297	5
Family structure	Mother has no other children	37,752	26
	Mother has other children, no grandchildren	73,133	49
	Mother has grandchildren from other children	37,002	25
Mother's union status	Lives with a partner	112,023	76
Daughter's union status	Lives with a partner	107,363	73
Mother's educational level	Lower secondary	80,410	54
	Higher secondary, postsecondary	37,699	25
	Tertiary	28,802	19
	Missing	976	1
Number of Mother–Daughter Dyads		16,742	
Number of Moving Episodes		22,471	
Time at Risk (in years)		147,887	

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and the failure rates of moving to the same municipality by the daughter's childbearing and child-rearing phases and by model type. Additional descriptive analyses in the online appendix will give readers a better sense of the Belgian context. Table A1 shows the distances between each mother–daughter dyad in our sample at each childbearing and child-rearing phase; Table A2 shows mothers' and adult daughters' move distances by childbearing and child-rearing phases. Finally, to explore the timing dynamics, we provide the Kaplan–Meier hazard function for each model specification (Figure A1).

**Table 2** Failure rates by the adult daughter's childbearing and child-rearing phases and by the type of model

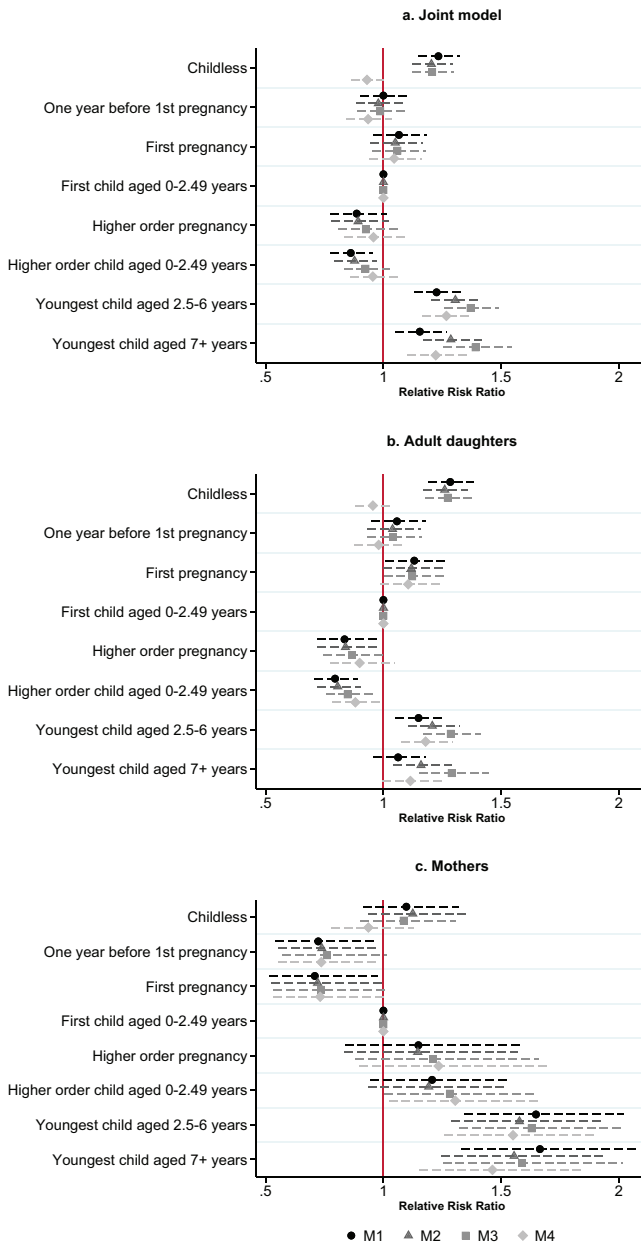
	Joint Sample		Daughter's Sample		Mother's Sample	
	Number of Failures	Failure Rate	Number of Failures	Failure Rate	Number of Failures	Failure Rate
Childless	4,007	.0829	3,553	.0635	575	.01
One Year Before 1st Pregnancy	577	.0696	518	.0547	66	.0066
First Pregnancy	485	.072	440	.0556	50	.006
Higher Order Pregnancy	1,030	.06	892	.0415	155	.0067
First Child Aged 0–2.49 Years	253	.0484	209	.0303	50	.0067
Higher Order Child Aged 0–2.49 Years	563	.042	444	.0236	125	.0062
Youngest Child Aged 2.5–6 Years	1,598	.0536	1,295	.0278	370	.0075
Youngest Child Aged 7+ Years	923	.0487	763	.0226	248	.0074
Total	9,436	.0638	8,114	.0404	1,639	.0078

Overall, the descriptive results show that mothers and daughters tend to live relatively close, less than 10 kilometers from each other. In addition, their moves tend to be short, at 11–20 kilometers (Tables A1 and A2). Daughters lived closest to their mothers during the childless phase, the longest phase observed. In the childbearing and child-rearing phases, the distance between mothers and daughters increased. Both mothers and daughters were most mobile during the childless phase (Table 2). Daughters were moving the longest distances while childless and reducing the mean distance of their moves as they progressed through the subsequent phases (Table A2). Mothers were quite unlikely to move throughout most of their daughters' childbearing and child-rearing phases, but they became more mobile during the last two child-rearing phases (Tables 2 and A2).

### Multivariate Results

To better illustrate the results from different specifications of nested models, we present in Figure 2 the relative risk of the childbearing and child-rearing phases variable for the joint model (panel a), the daughter model (panel b), and the mother model (panel c), as well as for each model specification 1 to 4. Complete regression results are available in Tables A4–A6. In all specifications the reference category for the daughter's childbearing and child-rearing phases is having a first child younger than 2.5 years (and not pregnant with a second child). Finally, for each type of model and for each model specification, we present both Bayesian and Akaike information criteria (last row in Tables A1–A4) to compare goodness-of-fit indicators.

Panel a of Figure 2 shows the relative risk of the mother–daughter dyad again living in the same municipality at different phases of the adult daughter's childbearing and child-rearing years. An adult daughter and her mother were more likely to be living in the same municipality again if the daughter was childless than if she had children (Models 1, 2, and 3). However, once we control for the adult daughter's



**Fig. 2** Relative risk of moving to the same municipality for both the mother and the daughter (panel a), for the adult daughter only (panel b), and for the mother only (panel c) at different phases of the adult daughter’s childbearing years. The reference category is having a first child aged 0–2.49 years. Model 1 (M1): null model. Model 2 (M2): childbearing and child-rearing phases and number of moves. Model 3 (M3): childbearing and child-rearing phases, number of moves, adult daughter’s age, mother’s age, mother’s partnership status, and mother’s educational level. Model 4 (M4): childbearing and child-rearing phases, number of moves, adult daughter’s age, mother’s age, mother’s partnership status, mother’s educational level, and adult daughter’s partnership status. Robust confidence intervals are calculated. The other variables are left at their original values.



partnership status (Model 4), this difference disappears. Focusing on the daughter model (panel b), we observe that a childless daughter had a higher risk of moving to her mother's municipality than a daughter with a young first child, unless we control for the adult daughter's partnership status. Results for the mother model (panel c) indicate that a mother whose adult daughter was childless had a higher risk of moving to her daughter's municipality. This effect disappears when we control for the adult daughter's and mother's ages compared with the baseline. Comparing the results across all three models (panels a–c) reveals that they were driven by the adult daughters' mobility: having a partner reduced the relative risk of a childless adult daughter moving to her mother's municipality.

When we consider the relative risk of the mother and the daughter again living close in the joint model (Figure 2, panel a), we find that the period of the daughter's first pregnancy did not differ from the period when the daughter had a single child younger than 2.5 years. However, the daughter model (panel b) indicates that the adult daughter was more likely to move to her mother's municipality when she was pregnant with her first child than she was when the first child was aged 0–2.49 years. This result does not hold for higher order pregnancies, for which the relative risk of the daughter moving closer to her mother's municipality is lower than the baseline. This finding might signal that proximity was perceived to be especially important in anticipation of a transition to parenthood. In line with this result, the mother model consistently showed that a mother whose adult daughter was in her first pregnancy was less likely to move to her daughter's municipality than a mother whose daughter had a first child younger than 2.5 years.

Findings from the joint model and the daughter model (Figure 2, panels a and b) suggest that when the adult daughter had two or more children and the youngest was under 2.5 years, the relative risk of the mother and the daughter again living in the same municipality was lower than it was when the adult daughter had only a single child of that age. Conversely, in the mother model (panel c), the mother's risk of moving to her daughter's municipality increased when the daughter had two or more children and the youngest was under 2.5 years. This result is particularly strong after we control for the adult daughter's age, the mother's age, the mother's partnership status, and the mother's educational level (Model 3).

The joint model (Figure 2, panel a) shows that when the adult daughter's youngest child was aged 2.5–6 years, the relative risk of the mother and the daughter again living in the same municipality was higher than that for the reference category. This result holds in the daughter and mother models (panels b and c, respectively).

Finally, in the joint model (Figure 2, panel a), when the adult daughter's youngest child was aged 7+ years, the relative risk of the mother and the daughter again living in the same municipality was higher than it was when the adult daughter's first child was aged 0–2.49 years. The results of the adult daughter model (panel b) are similar to those in the joint model. However, once we control for the adult daughter's union status (Model 4b), the relative risk of an adult daughter with children aged 7+ years moving to her mother's municipality is no longer statistically different from the risk for an adult daughter with a first child aged 0–2.49 years. This finding might indicate that a possible change in union status (e.g., a separation) might influence the adult daughter's mobility, as highlighted studies found (Das et al. 2017; Spring et al. 2021).

All in all, the mother's and daughter's mobility tended to be opposite during certain childbearing and child-rearing phases, such that the adult daughter was more likely to be mobile when her mother was less mobile. Specifically, while childless or during her first pregnancy, the adult daughter was more likely to move closer to her mother. Conversely, the mother was more likely to move closer during the adult daughter's higher order pregnancies or when the adult daughter had more than one child. However, the mother's and daughter's mobility tendencies seem to have been similar—with both of them more or less likely to move closer—during certain other childbearing and child-rearing phases. Specifically, both seemed to move closer to the other when the adult daughter's child was older than 2.5 years.

### Robustness Checks

To ensure the robustness of our results, we performed several additional checks. Given the debate about endogeneity and the interdependence of mother–adult daughter proximity and the adult daughter's childbearing and child-rearing phases, we reran our specifications while allowing for unobserved frailty. Here, unobserved frailty is an indirect measure of selection on time-constant individual unobservable characteristics in the model (Kulu and Steele 2013; Lillard 1993). The model results did not differ from those of simpler models presented earlier, and controlling for prior experience of living apart already accounted for most heterogeneity (for complete results, see Table A7). Therefore, we chose to display the simpler models. Furthermore, we tested an alternative specification of living close: a maximum distance of 10 kilometers between town halls of their respective areas of residence (see Figure A2; complete regression results are available upon request). Results of this analysis show that adult daughters move closer to their mothers if the move is short (within 10 kilometers) and does not disrupt their everyday lives. However, they are less likely to make a long-distance move (>10 kilometers) after their second pregnancy.

### Discussion

The current study investigated how different phases of an adult daughter's childbearing and child-rearing years affected mother–daughter geographical proximity. We explored the Belgian context, taking advantage of new but increasingly available register data for that country. We selected mother–daughter dyads who were already living in different municipalities and measured their risk of moving to the same municipality across different phases of the adult daughter's childbearing and child-rearing years. We estimated three types of models: in the first, we modeled the mothers' and the adult daughters' moves jointly; in the second, we modeled only the adult daughters' moves; and in the third, we modeled only the mothers' moves. We found that the adult daughter was more likely to move to her mother's municipality when she was childless and unpartnered or during her first pregnancy, and she was less likely to do so during a higher order pregnancy or when her youngest child was aged 0–2.49 years. Conversely, the mother was more likely to move to her adult daughter's municipality if her adult daughter's youngest child was at least 2.5 years old.

Our study contributes to the growing literature on the role of family ties in (im)mobility. First, it is the first to provide a detailed examination of the relationship between childbearing and child-rearing phases and daughter–mother proximity. Second, it explores both the mother’s and the adult daughter’s mobility using a life course approach covering most of the daughter’s reproductive years (ages 16–39). Our results highlight the importance of considering both the adult daughter’s and the mother’s mobility perspectives, given that the different phases of the adult daughter’s childbearing and child-rearing years affected mobility differently for the two generations. Furthermore, most previous knowledge on this topic was from the Scandinavian context. Thus, this study also contributes to the literature by examining mother–adult daughter proximity in the context of a continental welfare regime (Esping-Andersen 1990).

On a more speculative note, our findings seem to show that an adult daughter was more likely to move closer to her mother in *anticipation* of the challenges of motherhood—that is, during her first pregnancy or before having a second child. The mother, however, was more likely to move closer to her adult daughter *depending on the ages and number of her* (grand)children—that is, when the adult daughter had at least two children, one of whom was a toddler.

In line with previous studies, we found that the adult daughters’ residential relocation was more likely during her first pregnancy (Kulu and Steele 2013; Michielin et al. 2008; Vidal et al. 2017). One possible explanation for this finding is that because the mother’s proximity might increase her adult daughter’s likelihood of having children (Compton and Pollak 2014; Pink 2018), an adult daughter who moves in anticipation of her entry into motherhood might do so because she is already planning to have several children and sees value in living closer to her mother during this phase of her life. Thus, an adult daughter may be less likely to move during a higher order pregnancy or while her second or higher order child is a toddler because her mother is already living close. Additionally, if an adult daughter in this situation is living far from her mother, she may be less likely to move because her first child is already in school or because she is juggling work and caring for at least two children. Finally, in line with the location-specific capital accumulation theory, the adult daughter might be more likely to move when she has not yet developed enough links within the community through her children. Conversely, the adult daughter may tend to move less when having several links with the community through her children.

The results for mothers showed that a mother was more likely to move closer to her adult daughter at the earliest after the birth of the second grandchild, specifically when the youngest grandchild was school-age. One possible explanation for this finding is that this group of mothers is more selected—that is, their daughters did not move close to them sooner. As a consequence, the decision to move may be driven by the mother’s preferences to increase her contact with her grandchildren (Svensson et al. 2015)—for instance, retiring earlier to enable such a move (Van Bavel and De Winter 2013)—or by the adult daughter’s compelling need for additional instrumental and emotional support. The location-specific capital accumulation theory (DaVanzo 1981) suggests that relative to daughters, mothers may move less often because mothers have more location-specific capital. However, during certain phases, mothers move toward their daughters. Thus, family ties seem more important than location-specific capital under certain conditions.

Some limitations need to be acknowledged. First, although we included the mother's educational level, we could not include the adult daughter's educational level or employment trajectory because of data limitations. Future research should explore how work trajectories might influence mothers' and adult daughters' mobility during this life phase. Second, we used a general measure of family structure controlling for the presence of both other children and grandchildren. Third, by analyzing those dyads that had already moved apart previously, we introduce selection into the analysis. In fact, moving away from parents—especially for the first time—is too costly for some, even in a small country like Belgium, where residential mobility might be easier. Finally, although mother–daughter dyads are a particularly good tie for studying the relationship between mobility and fertility, not all mother–daughter bonds are strong. Exploring variation in these bonds is beyond the purpose of this study and remains for future studies to examine.

The current study illuminates how an adult daughter's childbearing and child-rearing phases may change the spatial proximity of a mother and her daughter. This study is the first to analyze both the daughter's and mother's mobility perspectives, highlighting the importance of adopting a linked-lives approach (Giele and Elder 1998) and exploring beyond the association between mobility and the transition to parenthood to consider the link between mobility and higher order births, as well as subsequent child-rearing phases. ■

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