Anticipated (Grand-)Parental Childcare Support and the Decision to Become a Parent

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Abstract Based on a cost-reduction argument, this study explored whether anticipated childcare support from their mothers influenced adult daughters' decisions to have their first child. Using six waves of the German Family Panel (pairfam), discrete-time hazard models ($N = 3155$ women) were estimated for the transition to the decision to have the first child. Anticipated childcare support from the women's mothers was approximated by the travelling distance between adult daughters and their mothers, a measure whose suitability was tested empirically. The results indicated that women in a position to anticipate having access to childcare support in the future decided to make the transition to parenthood earlier. This finding highlights both the strength of social interaction effects on fertility decision-making and the importance of intergenerational relationships for individual fertility histories already at their very beginning.

Keywords Transition to parenthood · Social interaction · Grandparental support · Fertility decision-making

1 Introduction

Grandparental childcare support to adult children has been (and remains) widespread in Germany. Grandparents look after more than one-third of children under the age of three (Kügler 2007). Approximately every third grandmother is involved in childcare activities on a regular basis (i.e. weekly or more often), and every second grandmother provides some form of childcare at some point during the year (Attias-Donfut et al. 2005; Hank and Buber 2009). Grandparents even adapt

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their retirement preferences (Hochman and Lewin-Epstein 2013) as well as the timing of their retirement (van Bavel and de Winter 2013) to fit with their adult children's fertility behaviour. In general, these parental time transfers are thought to relieve the adult children and consequentially reduce their costs of childbearing (Aassve et al. 2012; Thomese and Liefbroer 2013).

Knowing about this tremendous (grand-)parental involvement and the attendant benefits for their adult children immediately gives rise to the question whether those adult children who anticipate having access to childcare support from their parents in the future are more likely to decide to have a first child earlier. If this were the case, adult children who may anticipate childcare support from their parents would be considerably advantaged compared to those who cannot. This would be an important finding for research on both intergenerational relationships and fertility decision-making. This study highlights the relevance of downward transfers from the older generation at the very beginning of the younger generation's fertility histories. More precisely, it clarifies that parental childcare support not only matters for fertility decisions after it already has been experienced, such as having one's second or third child after the first child has already been cared for by its grandparents (Thomese and Liefbroer 2013). Rather the simple anticipation of such support facilitates and therefore positively affects the decision to become a parent in the first place.

My study assessed this question for the first time and therefore concentrates on the most likely recipient of childcare support, the adult daughter, and the most likely provider, her mother (i.e. the maternal mother). The empirical analysis was based on 3155 women from six waves of the German Family Panel and discrete-time hazard models for the transition to the decision to make the transition to motherhood using 11,427 person-years. The dependent process was operationalized as a combination of engagement in preceptive behaviour (Miller and Pasta 1995), which gets very close to the timing of the actual decision, as well as being pregnant at the time of the interview. Anticipated maternal childcare support was approximated by an extraordinarily detailed measure of travelling distance between daughters and their mothers. In other words, I will interpret it as a proxy of women's anticipation of (grand-)maternal childcare availability. Although travelling distance lacked the central concept of anticipation, an empirical test confirmed that it reflects anticipated maternal childcare support very well. Additionally, as geographical proximity may be related to fertility-relevant parental pressure, I net out the effect of social pressure.

2 Theoretical Background

Previous research has repeatedly shown that both men and women anticipate that children will produce diverse costs (Fawcett 1988) and that these anticipated costs negatively influence the transition to parenthood (Liefbroer 2005). I argue that the reason for adult children to anticipate future childcare support from their parents, and thus to incorporate their parents' availability and willingness to be caregivers into their decision-making, is that the expectation to receive support *lowers their*

anticipated costs of childbearing (e.g. Aassve et al. 2012; Mathews and Sear 2013; Thomese and Liefbroer 2013). Therefore, I expect that anticipated childcare support (regardless of whether or not such support materializes) will facilitate the decision to become a parent and, as a consequence, positively influence the timing of the decision (Keim et al. 2013). This argument is very general in nature and does not lose strength if usage of comprehensive formal childcare is anticipated, too.

2.1 The Certainty of the Realization of Anticipated Childcare Support

How certain can adult children be that their parents in fact will enact their anticipation? This question pertains to the parents' motivation and availability (or ability) to assist with childcare. Theoretical considerations unpacking the *motivational structure* are provided by evolutionary, sociological, and economic theories (Coall and Hertwig 2010).

The *evolutionary* perspective rests on the notion of inclusive fitness. (Grand-)parents provide childcare support because they want to further their genes. In this respect, childcare promotes child survival and consequently the survival of their genes (Hrdy 2009). The *sociological* perspective emphasizes parents as a "reserve army", family safeguards, or kin keepers (Dubas 2001; Hagestad 1986; Rosenthal 1985). It highlights the idea that parents' supportiveness in times of need is an "implicit understanding" (Hagestad 2006, 325) shared by adult children and their parents. The *economic* perspective stresses the cost–benefit nexus of fertility (Becker 1991). On the one hand, parents may act altruistically, incorporating their adult children's utility into their own (joint) utility function. Parents' caring for their offspring's children reduces the adult children's costs of childbearing, thus raising parents' utility (Goodfellow and Laverty 2003; Piliavin and Charng 1990). On the other hand, parents may assist with childcare in the interest of long-term reciprocity (Hollstein and Bria 1998). In return for their time transfers when their grandchildren are young, they expect to receive time transfers from their adult children in the form of care when they eventually become frail (Künemund et al. 2005; Silverstein and Giarrusso 2010). Taken together, all three disciplines provide strong arguments to assume that parents should meet the anticipation of their adult children (certainly to varying degrees) when they are requested.

Moreover, these theoretical considerations, from a couples' perspective, allow the specification of the intra-familial dyad along which time transfers will most likely flow. The *evolutionary* perspective suggests that of all grandparents, mostly the grandmothers (Hawkes et al. 1998; Hrdy 2009), and more specifically those on the mother's side, will primarily provide support because the maternal grandmother can be most sure of her genetic relationship to her grandchildren (Coall et al. 2014). The *sociological* perspective implies that because of the gendered nature of the grandparent role "as essentially a maternal one" (Hagestad 1986), grandmothers are expected to be more involved with their grandchildren, as they feel more responsible for intra-familial issues (Mulder and van der Meer 2009; Rosenthal 1985). Taken together with the concept of the mother link (i.e. stronger and closer links between mothers and their daughters over the life course; Dubas 2001; Fischer 1991), maternal grandmothers are seen as particularly important providers of care

for their adult daughters' offspring (Thomese and Liefbroer 2013). The *economic* perspective suggests that daughters are more likely than sons to receive childcare support, as they are more likely to act reciprocally, as females mostly provide care for their elders (Kaptijn et al. 2013; Pillemer and Suitor 2006). These theoretical considerations lead to the following assumptions: among adult children, daughters are most likely to receive support; among parents, women's mothers most likely will provide support. Therefore, within a couple's decision-making process about whether and when to have their first child, the woman's mother is most likely to be the prominent parent.

2.2 Geographical Proximity to Parents and Realized Childcare Support

Besides the parents being alive, the primary precondition for receiving parental childcare support is geographical proximity between adult children and their parents. Previous research has shown repeatedly that in the presence of young children the probability of receiving childcare support from grandparents is positively associated with geographical proximity: the shorter the distance between adult children and their parents, the greater the probability of such support (Belsky and Rovine 1984; Jappens and van Bavel 2012; Kaptijn et al. 2013; Kügler 2007; Waynforth 2012). The greater the geographical distance, the more time is consumed by travel, which renders flexible childcare less and less feasible. Applied to the anticipation of receiving childcare support, the results of this research suggest a negative relationship between geographical distance and anticipation.

2.3 Residential Distances Between Adult Children and Their Parents

This raises the question about the general distribution of geographical distances between the generations. In Germany, most people live close enough to their extended family to visit members of different generations on short notice. This begins already at the initial move out from the parental home, for which the median distance has been estimated at less than 10 km (Leopold et al. 2012). Over the life course, moves predominantly remain local and rarely exceed 20 km (Wagner 1989). Wagner (1989, 168) shows that at the age of 30, around 40% of those raised in villages and 60% of those raised in cities continued to reside in the same place. Isengard (2013) shows that over 60% of residential distances between parents and their adult children do not exceed 25 km; around 18% even denote co-residence. Tremendous residential distances of more than 100 km apply to around 22%. These numbers suggest that the generations are not very regionally dispersed.

2.4 Alternative Explanations

The suggested positive relationship between geographical proximity and the decision to become a parent, however, could be accounted for by two alternative explanations: social pressure and endogeneity. First, previous research has shown that parents may be a source of *social pressure* when they demand grandchildren or urge their adult children not to have children yet (Balbo and Mills 2011; Barber and

Axinn 1998; Bernardi 2003; Fried and Udry 1980; Keim et al. 2013). Importantly, the assertiveness of this pressure is strengthened by direct face-to-face contact, and more so if the contact is frequently repeated (Cialdini and Goldstein 2004; Rossier and Bernardi 2009). Social pressure is a dimension of social influence (Rossier and Bernardi 2009) and Latané et al. (1995) showed that the strength of social influence is an inverse function of geographical distance. In turn, the assertiveness is indirectly a function of geographical proximity, as geographical proximity translates into more frequent direct face-to-face contact (Frankel and DeWit 1989; Lawton et al. 1994; Hank 2007). Therefore, social pressure by parents might only be effective at influencing adult children's decision-making, or at least making it more effective, if exerted in face-to-face interaction.

Second, although the preceding provides evidence that adult children and their parents tend to live geographically close, this proximity might be *endogenous* to fertility decision-making. In other words, anticipated parental childcare support may have factored into decisions about where to live. If this was the case, it would have at least two empirical implications. First, to assert the receipt of the support, those women anticipating childcare support should refrain from relocating too far away from their mothers when they move. Second, in case they earlier moved to a destination which does not (easily) allow for maternal childcare support, they should move closer before becoming pregnant. Previous research suggests that relocations with regard to fertility events occur quite frequently. Importantly, however, couples relocate mostly during pregnancy or soon after the birth of a baby (Feijten and Mulder 2002). These moves overwhelmingly remain local (Michielin and Mulder 2008), and their objective tends to be a more spacious dwelling or a more family-friendly environment (Del Boca et al. 2014; Feijten and Mulder 2002; Kulu and Washbrook 2014). Nevertheless, given that couples have to or want to move, they could also use such a move to optimize their anticipated caregiving configuration by moving closer to a potential caregiver, e.g. the woman's mother.

2.5 Closely Related Previous Research

Previous research closely related to my research question has been both qualitative and quantitative. Qualitative research has shown that German parents are important interaction partners at their children's transition to parenthood (Keim et al. 2009, 2013). A crucial factor within their children's decision-making process about their transition to parenthood was their parents' future availability to provide childcare. The overwhelming majority of respondents declared that "parental support is expected as normal" (Keim et al. 2013, 8). Where such support was known to be lacking, this was considered a hindrance to childbearing and a major reason for not having children yet.

Quantitative empirical evidence was based on two studies using the German Socio-Economic Panel Study (GSOEP). Both approximated anticipated maternal childcare support using geographical proximity to the maternal mother. However, there are two important differences to the current study that both very likely lead to an underestimation of the effect of anticipated maternal childcare support. First, both studies used the birth of a first child as the dependent event. Yet this indicates a

later point in time than that of the actual decision about whether to have a baby and can thus be expected to be more subject to endogeneity, as the preparatory moves during pregnancy might have been used to move closer to the mother. Second, geographical proximity was measured as a binary indicator, mixing qualitatively different living situations. Focusing on the years 1996–2000, Hank and Kreyenfeld (2003) found that if their mother resided in the same house, in the neighbourhood, or in the same city/village but not more than a 15-min walk away, women's transition rate to parenthood increased by 32%. Focusing on the years 1992–2007, Arránz Becker and Lois (2013) found that if a woman's mother or father lived in the respondent's household or vicinity, the transition rate increased by 36%. However, it should be noted that inspecting these effects was not the primary concern of these studies.

3 Data and Methods

I employed six annual waves (2008–2013) of the German Family Panel (pairfam) (Huinink et al. 2011; Brüderl et al. 2015a). The data were based on a stratified random sample of three birth cohorts (1971–73; 1981–83; 1991–93) and provided information on 12,402 respondents. All following analyses employ design weights to correct for disproportionate sampling (i.e. oversampling of age groups) across cohorts (Brüderl et al. 2015b).

The goal of the subsequent sample selection procedure was to create a sample that allowed me to investigate the anticipation argument for those for whom the theoretical considerations predicted it most likely to hold: women who are equipped with the biological and social means to decide to make the transition to parenthood and whose mothers are still alive. The richness of the surveyed fertility-relevant information allowed me to select this sample very precisely, proceeding in nine steps.

First, I restricted the gross sample to 6373 female respondents. Second, I restricted the sample to the 4150 women from the two youngest cohorts. I did not incorporate information from the third cohort to avoid introducing bias, because only a very small group of 292 childless women, on average 38 years old, remained after this (entire) sample selection procedure. Substantively, since they were in the last quarter of their fertile period and potentially facing biological challenges getting pregnant, their fertility decision-making very likely differed considerably from that of the two younger cohorts. Another more technical reason was that this group provided only 7.3% of the information mass for describing the later phases of the fertile period compared to the information that is used to describe the earlier phases. As a result, introducing the third cohort would have added a considerable amount of uncertainty in the estimation procedure. Third, as I was interested in the decision to make the transition to parenthood, I only considered the 3372 women who were childless and not pregnant at their first observation. Fourth, 84 homosexual women were omitted from the analyses. Fifth, I excluded 112 women who were known to be infertile or who had a partner who was known to be infertile. Sixth, seven respondents were not subject to the analyses because they were observed only once

with 14 years, one year before the process time began. Seventh, I excluded 14 respondents because the living distance to their mother was unknown to them. Eighth, I removed all women's observation years after the dependent event applied. The final sample comprised 3155 women with 11,427 person-years of observation.

3.1 Dependent Variable: Decision to Have the First Child

The event of interest was a woman's decision to become a mother, i.e. trying to become pregnant by pursuing proceptive behaviour (Miller and Pasta 1995). I operationalized the timing of this decision on an annual basis using a twofold approach. First, the dependent variable took a value of 1 in the respective survey year if the respondent declared that she had tried to become pregnant during the last 12 months (204 events). This question, however, was not asked of pregnant respondents. For them, second, the dependent variable took a value of 1 for their previous year of observation because then the decision to become a mother was most likely made closer to the previous wave (announcing a pregnancy after around the third month; time to pregnancy around three months). I attributed those latter events to one wave earlier (230 events). In total, this procedure yielded 434 events.

3.2 Approximation of Anticipated Maternal Childcare Support

I approximated anticipated maternal childcare support by its central precondition: women's geographical proximity to their mothers. I operationalized geographical distance as travelling time, which was categorically measured by the question "How much time do you need to get to your mother's dwelling (on a normal day, using normal means of transportation)?" Travelling time is superior to metric distances, which are often calculated on the basis of geocoded distances "as the crow flies", as it captures the actual time consumption by the travel (Phibbs and Luft 1995). I combined these answer categories with detailed information about living arrangements to build a measure of five travelling (or living) distances: "same house (also same household and students denoting the maternal home as a second household)", "less than 10 min", "10 min to less than 30 min", "30 min to less than 60 min", and "more than 60 min".

Although the travelling distance to the mother promises to be the best approximation of anticipated maternal childcare support currently available and has been applied before for this purpose (Arránz Becker and Lois 2013; Hank and Kreyenfeld 2003), its appropriateness has not been tested empirically. Theoretically, the expectation is that the closer adult daughters live to their mothers, the more likely it is that they will anticipate maternal childcare support because smaller distances should render the receipt easier (all else being equal). To test this expectation, I employed a question asked in all but the fifth wave to respondents aged 20 and older. It refers precisely to the anticipation of childcare, the element that is not explicitly captured (but assumed to be approximated) by the travelling distance.

In a two-step procedure, respondents were first asked to what extent having access to flexible childcare support was a necessary condition when they were

deciding whether to have their first child (“I need access to flexible childcare options for the child”). Answer categories ranged from “Not at all” to “Absolutely” on a five-point scale). Next, they were asked whether they evaluated this prerequisite as being fulfilled. The phrase “flexible childcare options” denotes only the pool of potential caregivers (both informal and formal) rather than specific individuals. However, previous research provides evidence for which types of relationships are likely to be considered when respondents evaluate who in their local support network is eligible to provide childcare. In Germany, other informal providers of childcare besides the closest kin (i.e. the child’s own parents and grandparents) are seldom utilized. Siblings, friends, and neighbours are rarely used sources of childcare support (Hank et al. 2004). Alt and Teubner (2007) found that grandparents were involved in care (at least one day of a typical week) for 34% of children under three years old. The share of other caregivers was far smaller. Siblings were involved in 5% of cases, friends in 5%, and extended kin in 3% of cases.

Taken together, the preceding provides good arguments to assume that (1) daughters consider their mothers to a large extent when determining their pool of potential caregivers and (2) the availability of the woman’s mother should be the dominant factor in identifying “flexible childcare options”. For the empirical analysis, I retrieved the last observed values of these two steps for each respondent. Then, I estimated the share of those that anticipated access to assistance with childcare (the second question) over the five categories of travelling distance, among those that viewed having access as a prerequisite (the first question; at least value 3; $N = 2291$). Figure 1 shows the results.

The relation between anticipated childcare and travelling distance to the mother corroborates the expectation and thus justifies its use as an approximation. The longer the travelling time, the less adult daughters anticipate that their mothers will provide them with childcare support. In other words, the greater the distance, the less the mother is considered to be in the pool of caregivers—and because she is such an important caregiver, the less adult daughters have the impression that they have sufficiently flexible childcare available to make the decision. This holds for adult daughters who reside apart from their mothers. The low affirmation share of those sharing the same location, leading optically to an inverse U-shaped relation, is counter to the theoretical expectation. Why should daughters residing closest to their mothers anticipate their help (almost) the least? Theoretical arguments suggest that their share affirming flexible childcare should be the highest.

The most likely answer to this question lies in the extent to which those residing with their mothers have already considered the transition to parenthood as an action alternative. Previous research on fertility decision-making has repeatedly shown that a feeling of being ready for parenthood often precedes the birth of the first child (Buber-Ennsner and Fliegenschnee 2013; Keim 2011). This, however, is typically only reached after a certain degree of maturation into adulthood has taken place. An integral part of this maturation process is establishing one’s independence (Goldscheider et al. 2014; Luetzelberger 2014). To gain this independence, as is common for individualistic Northern European countries, in Germany, adult daughters leave their parental home rather early (Billari and Liefbroer 2010).

Fig. 1 Sensitivity analysis of the approximation ($N = 2291$). *Note:* data are from the German Family Panel (pairfam), own calculations, weighted results

Therefore, (still) residing in the parental household characterizes a situation in which the transition to parenthood typically is not considered an action alternative. As a result, for most respondents in this situation, the answer to the question about “flexible childcare options” should denote rather a kind of thought experiment, an abstract event taking place far in the future, because becoming a parent is (at least) two steps ahead of them (first independence by moving out, then having a child), or even three if they do not have a partner yet. On average, those living at home estimate their transition to motherhood as coming 7.4 years after their last observation, which supports the argument that these women have not thought too much about the details of a situation that will take place far in the future. Taken together, this absence of having deliberated about parenthood, for which the positive endpoint would be a feeling of being ready to start a family, is the reason that mothers have not yet become salient as a potential source of childcare support.

This explanation is supported by two empirical findings. First, for some, a rather small group ($N = 74$), who are older, have a partner in a longer relationship, have deliberated with him about childbearing, and have come to the conclusion that, as a couple, they are ready to become parents themselves (expecting to become parents within the next 3.3 years), the mother has become salient as a source of support for her daughter. This is shown in Fig. 1 in the single square at 67% that shows the highest share of affirmation overall. This corroborates the overall theoretical expectation of a decreasing anticipation of childcare support with increased travelling time. Second, the mother becomes more salient as a childcare giver the more independent the adult daughter’s housing situation becomes, given a negligible change in distance. On the one hand, this finding is reflected in the

large leap in anticipation shares between the first two categories. On the other hand, it is supported by further analyses, in which I split the category “same location” into “same household” ($N = 556$), “same house, parental/self-owned apartment” ($N = 55$), and “same house, rented apartment” ($N = 30$). Comparing the resulting shares indicated a step-by-step increase in affirmation with increasing independence from the mother. “Same house, rented apartment” featured the highest share (68%) while “same household” was the lowest (31%).

The suitability of travelling distance as an approximation of anticipated maternal childcare support, carried out in the same manner, was further supported in additional analyses shown in Table 5. Travelling distance was not substantively related to the extent of (educational or occupational) career commitment. Therefore, I suspended the hypothesis that a negative effect of travelling distance would instead be an effect of the strength of career considerations, because those who lived further from their mothers could have been more dedicated to their careers and therefore delayed the transition to motherhood. Furthermore, travelling distance was not related to fertility-relevant characteristics such as tie strength to mother, ideal number of children, and realistic number of children as shown in Table 8.

3.3 Parental Pressure

As highlighted in the theory section, a positive effect of geographical proximity to the mother on the transition rate to the decision to become a parent might not only have measured anticipated childcare support, but also reflected the likelihood (and/or the perceived intensity) of a woman’s mother’s social pressure to have grandchildren. To net out social pressure from the approximation of anticipated childcare support, I took the respondents’ perception of this pressure explicitly into account. This measure was used previously to detect the effect of perceived social pressure on fertility intentions (Balbo and Mills 2011) and the realization of positive intentions (Kuhnt and Trappe 2013) in Germany. Preceded by questions about long-term fertility plans and short-term fertility intentions, the pertinent question was: “My parents think that I should have a child”. Answer categories ranged from “disagree completely” to “agree completely” on a five-point scale. In alignment with previous research (Kuhnt and Trappe 2013), I built a categorical variable denoting complete disagreement as “no”, the three middle categories as “mildly”, and complete agreement as “strongly” perceived pressure (cf., Liefbroer and Billari 2010).

3.4 Control Variables

Control variables comprised indicators at the familial, regional, and individual level. At the familial level, I controlled for mother’s age, conflict with her, as well as number of siblings. Mother’s age was sought to approximate her availability in terms of labour market attachment as well as health status (Aassve et al. 2012). Due to the survey design, the pairfam data did not entail more proxy information about maternal characteristics that would have allowed us to model her availability more precisely. Pairfam used a multi-actor design that surveyed the parents individually.

Unfortunately, of the 3155 women, only 42.2% had any information available from their mothers. Relationship quality has been shown to be a poor predictor of whether a woman's mother would provide childcare support, except in the case of conflict-laden relationships (Keim 2011). Therefore, a binary variable indicated whether the respondent and her mother either fought with each other or were angry at each other "often" or "always" (compared to "never", "seldom", and "sometimes"). To control for family-size values (Murphy and Knudsen 2002) and the mothers' potential unavailability due to parallel childcare claims from siblings (Kaptijn et al. 2010), I included the number of siblings.

At the regional level, I controlled for the urbanization of the municipality using the BIK region classification (BIK Aschpurwis + Behrens GmbH 2015) provided by the pairfam data. These indicators were sought to control for generations living closer to each other in urbanized areas due to more comprehensive labour, educational, and housing market opportunities (Isengard 2013), as well as to control for differing fertility levels between rural and urban areas (Hank 2001). I distinguished between rural regions up to 50,000 inhabitants (rural), periphery between 50,000 and 500,000 inhabitants (periphery smaller), periphery above 500,000 inhabitants (periphery larger), city centres between 50,000 and 500,000 inhabitants (city smaller), and city centres above 500,000 inhabitants (city larger). In addition, a binary variable indicated whether the respondent was located in Eastern Germany. This controlled for differing fertility profiles between the two parts of Germany, especially the tendency for women in the Eastern part to have children younger (Goldstein and Kreyenfeld 2011).

At the individual level, I included six important determinants of the transition to parenthood identified repeatedly by previous research. First, highest educational degree distinguished between basic secondary school or less (9 or fewer years of education), intermediate secondary school (10 or 11 years of education), or upper secondary school (12 or more years of education). Second, a binary indicator controlled for full-time educational enrolment as being in general secondary school or studying at a university, university of cooperative education, business school, or technical school. This indicator was sought to control for norms of role transition, i.e. completing education before starting a family (Blossfeld and Huinink 1991). Without controlling for educational enrolment, it might well be that living in the same location as the mother has a negative effect on the transition rate because a large part of those living in the same location were pursuing their education and postponed having a baby for this reason. Third, I controlled for relationship status and, fourth, for marital status. Fifth, I applied an indicator varying between 0 and 1 that captured the importance of the professional sphere (education or career) relative to other spheres of life (leisure time activities, social contacts, relationship, and family formation). Respondents were asked to distribute 15 tokens to these spheres of life to denote their relative importance (Bauer and Kneip 2013). This indicator was utilized to control for a general tendency to delay childbearing because of prioritizing one's career. Sixth, I controlled whether the respondent was full-time employed. Process time was measured in years beginning from the age of 15 onwards. Table 1 provides an overview of the variables.

Table 1 Description of variables ($N = 3155$)

	Mean	SD	Percentage missing	Range
Decision	.04			0–1
Mother lives within (ref.: more than 60 min)				
Same location	.65			0–1
Up to 10 min travel time	.06			0–1
10–30 min travel time	.06			0–1
30–60 min travel time	.05			0–1
Process time				
Years ^a	6.71	4.69		1–19
Familial characteristics				
Perceived social pressure (ref.: mild)				
None	.78		14.70	0–1
Strong	.08			0–1
Conflict with mother	.23		2.05	0–1
Mother's age (in years)	48.21	6.21	3.26	31–73
Siblings (ref.: none)				
1	.49		.35	0–1
2	.21			0–1
3+	.11			0–1
Regional characteristics				
Settlement structure (ref.: larger city)				
Rural	.25			0–1
Periphery (smaller)	.23			0–1
Periphery (larger)	.11			0–1
City (smaller)	.18			0–1
East Germany	.17			0–1
Individual characteristics				
In a partnership	.51			0–1
Married	.04		.56	0–1
In education	.51		.40	0–1
Full-time employed	.21		.07	0–1
Importance of professional life	.29	.12	.10	0–1
Education (ref.: high)				
Low	.45		.14	0–1
Intermediate	.21			0–1
Person-years (overall)	11,427			

Data are from the German Family Panel (pairfam), own calculations

^aYears since age 15 with age 15 denoting the first year

As shown in Table 1, although it covers the larger part of the fertile period, the overall mean age of 20.7 years (at age 15 process time start with 1) indicates that the sample emphasizes its earlier phases. This feature results from the study's design as

a sample of birth cohorts. Since the analysis sample comprised only those who were childless and not pregnant at their first observation, fewer respondents could be retained from the cohort born between 1981 and 1983 ($N = 1112$) than from the cohort born between 1991 and 1993 ($N = 2043$). For the following analyses, this means that the younger cohort captures rather births to less-educated respondents and the older cohort rather captures births to more-educated respondents.

3.5 Multiple Imputation of Missing Data

Overall, the variables contained few missing cases. However, the operationalization of social pressure was surveyed only four times: in the first, second, fourth, and sixth wave. As a result, this variable had missing values in 14.7% of the person-years. Importantly, the missing mechanism was known, missing by survey design, and could be assumed to be unrelated to either the dependent variable or any of the independent variables. Therefore, I applied multiple imputation by a sequence of chained equations and generated 20 imputations (Royston and White 2011; Young and Johnson 2015) to both cohorts separately and combined them afterwards (Gelman et al. 1998). Means and standard deviations after imputation were almost identical to those presented in Table 1.

3.6 Statistical Model

I employed discrete-time event history analysis using logistic regression (Allison 1982). A woman's time-contingent propensity to make the decision to have her first child was given by the hazard rate λ_{it} . This hazard rate was the conditional probability that a woman i 's decision to have her first child occurred at time t —under the condition that the woman was still childless. I started with a baseline model (Model 1) to establish the effect of anticipated maternal childcare support controlling only for process time and regional characteristics. In Model 2, I added indicators for social pressure as well as familial and individual characteristics to both better estimate the effect and to inspect the extent to which it remained. The models were specified as

$$\log\left(\frac{\lambda_{it}}{1 - \lambda_{it}}\right) = \alpha + \beta_1 r_t + \beta_2 r_t^2 + \beta_3 w_{it} + \beta_4 x_{it} + \beta_5 y_{it} + \beta_6 z_{it} + \varepsilon_{it}. \quad (1)$$

In this equation, α denotes the constant and r_t the linear and r_t^2 the squared process time; w_{it} is a vector for the dummies measuring anticipated maternal childcare support for woman i at time t ; x_{it} is a vector for the familial, y_{it} for the regional, and z_{it} for the individual characteristics; β_1 to β_6 denote the corresponding coefficients; and ε_{it} denotes the error term. Overall, this methodological approach is like an intention-to-treat analysis (Hollis and Campbell 1999) in which the treatment constitutes (grand-)mother's help with childcare and the intention, i.e. the assignment to receive the treatment, corresponds to having a (grand-)mother living nearby. However, the intention to be treated does not lead to ending up having been treated without exception. This is for various reasons mentioned earlier, e.g. the (grand-

)mother has other time-consuming obligations or a bad health status. Therefore, employing distance rather than help as the treatment probably leads to an underestimation of the effect.

3.7 Endogeneity and Robustness Checks

Before turning to the results of the discrete-time hazard models, I precede with an empirical investigation of the endogeneity argument outlined in the theory section. The data allowed me to assess the argument's two empirical implications, comparing the previous moving behaviour between those who decided to have their first child and those who did not; 2389 respondents had information available for at least one earlier wave of observation than their last or the one in which they made their decision. For 647 respondents, I observed a location change (67 who decided to have their first child, 580 who did not). Because of the low case numbers, I only considered the latest move. On a related note, it has to be borne in mind that a move might also have happened before the first observation, which I was not able to assess, as the whole migration history of the distances between mothers and their daughters is not available in the pairfam data. The latter is also the reason why I was not able to test the argument in a satisfactory way empirically that daughters may remain close to their mothers because of the future childcare support they anticipate to receive. However, analyses based on 20-year-olds from the first cohort ($N = 693$) indicate that those who never moved out of reach (i.e. stayed within 30 min travelling time) are no different from those who did, with regard to the two measures introduced earlier, estimating the importance of flexible childcare options ($p = 0.53$) as well as estimating the availability of flexible childcare options ($p = 0.31$). There are also no differences when I compare the answers at later ages (up to 23 years). This at least suggests that staying close is not primarily driven by anticipating childcare support. Furthermore, it should be noted that daughters who migrated outside Germany are not part of the analysis. This, however, seems to be a rather rare phenomenon, as official statistics for the year 2010 show that only around 0.3% of all 18- to 25-year-old German women migrated (Statistisches Bundesamt 2012). As outlined earlier, the first empirical implication predicted that those who made the decision should have been more reluctant to bridge distances that would have rendered receiving maternal childcare support rather difficult. To test this conservatively, I denoted travelling distances of at least 30 min as such costly distances impeding on maternal time transfers. Empirically, this first implication did not seem to apply, as the data indicated the opposite: 19.4% of those having made the decision and 7.6% of those not having made the decision moved beyond a travelling distance of 30 min (this difference is statistically significant at $p < 0.03$). The second empirical implication was that those who made the decision and who lived at a rather long travelling time before to be more likely to have moved closer prior to the decision to set the stage. For this, I found both no substantive and no statistical difference ($p = 0.26$) between the groups: 4.5% of those who had decided to have a baby and 1.6% of those who had not decided to have a baby moved into close proximity (i.e. from beyond 30 min to within 30 min). Furthermore, the average time lag between the last move and the last

observation in the data is 1.12 waves for those who did not make the decision and 0.96 waves for those who made the decision (see Table 6 for the distributions). This difference is neither substantively nor statistically significant ($p = 0.29$). These conclusions are further confirmed by a multinomial regression model under control of age, having a partner, being married, education level, and still being in education ($N = 2363$; using non-imputed data). The dependent variable differentiates between the categories “remaining below 30 min distance”, “remaining beyond 30 min distance”, “moving from beyond to below”, and “moving from below to beyond”. The results are presented in Table 7. Having made the decision to have the first child did not have a statistically significant effect on having moved closer ($p = 0.35$) nor of having moved farther ($p = 0.16$). Taken together, these findings suggest that women who decided to make the transition to parenthood rather did not prepare this decision by adjusting their residential location beforehand to facilitate their future receipt of maternal childcare support.

Furthermore, I conducted a series of robustness checks shown in Table 4. The results presented in the following section are robust to: (1) including the pairfam subsample DemoDiff (a sample including additional respondents from East Germany; person-years: 11,999); (2) including men in the analysis (24,541); (3) excluding singles (5823); (4) including the third cohort (12,250); (5) excluding co-residency in the youngest cohort (4702); and (6) excluding unplanned pregnancies from the youngest cohort (11,341).

4 Results

Table 2 shows the estimated coefficients of the two discrete-time hazard models for the transition to the decision to make the transition to parenthood (i.e. respondent either declaring having tried to become pregnant during the last 12 months or being pregnant at the time of the interview). I will concentrate on the main results, as the control variables merely confirmed what already had been well known from previous research.

Model 1, controlling for age and regional characteristics, establishes the effect of anticipated maternal childcare support for adult daughters. More precisely, it conveys three important findings. First, it shows that those adult daughters who reside outside the parental home within a distance rendering flexible maternal childcare support feasible (i.e. up to 30 min travelling time) may profit from this distance. They may be more likely to anticipate such support and thus are more likely to make the decision, compared to those who live more than one hour away and whose mothers therefore rather do not offer a feasible option for flexible childcare support. Statistically, however, both indicators do not differ (two-sided t test testing for the two estimates being different is not significant; $p = 0.15$). Substantively, this comes as no surprise, as it is very likely that at a travelling time of around 10 min the perceived marginal costs of travelling some more minutes are considerably lower than at around 30 min. In other words, a threshold of 30 min should better discriminate between women who do and do not anticipate childcare support from their mothers than a threshold of 10 min. The second finding

Table 2 Discrete-time hazard models for women's transition to making the decision to have the first child ($N = 3155$)

	Model 1		Model 2	
	Est.	SE	Est.	SE
Process time				
Years ^a	.32	(.07) ***	.17	(.08) *
Years squared	– .01	(.00) *	– .00	(.00)
Mother lives within (ref.: more than 60 min)				
Same location	– .30	(.13) *	– .06	(.15)
Up to 10 min travel time	.73	(.16) ***	.34	(.17) *
10–30 min travel time	.87	(.16) ***	.62	(.17) ***
30–60 min travel time	.19	(.20)	– .23	(.22)
Familial characteristics				
Perceived social pressure (ref.: mild)				
None			– .46	(.20) *
Strong			.59	(.17) **
Conflict with mother			.08	(.15)
Mother's age (in years)			– .03	(.01) **
Siblings (ref.: none)				
1			.26	(.17)
2			.32	(.19) ⁺
3+			.89	(.22) ***
Regional characteristics				
Settlement structure (ref.: larger city)				
Rural	.47	(.15) **	.23	(.17)
Periphery (smaller)	.39	(.16) *	.19	(.17)
Periphery (larger)	.22	(.20)	.07	(.21)
City (smaller)	– .02	(.17)	– .09	(.19)
East Germany	.70	(.12) ***	.98	(.14) ***
Individual characteristics				
In a partnership			1.68	(.20) ***
Married			1.74	(.15) ***
In education			– .52	(.19) **
Importance of professional life			– 2.64	(.66) ***
Full-time employed			.15	(.14)
Education (ref.: high)				
Low			1.02	(.17) ***
Medium			.53	(.14) ***
Constant	– 5.74	(.34) ***	– 4.68	(.78) ***
Person-years		11,427		11,427
Events		434		434

Data are from the German Family Panel (pairfam), own calculations, weighted results. Logistic regression coefficients are shown. Standard errors in parentheses. Model 2 is based on 20 sets of imputed data

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

^aYears since age 15 (age 15 denotes the first year)

corroborates this: those who live between 30 and 60 min away do not differ from those living more than 60 min away. Third, those living with their mothers in the same house (or even the same household) are markedly less likely to decide to have a baby than those for whom their mother is likely to be hardly or not at all available for flexible childcare support. At first, this seems to contradict the theoretical expectation, as living in the same location represents the shortest distance, and thus should render childcare support very easy and, as a result, positively influence the decision to become a mother. However, this living situation is at the same time characterized by strong normative expectations to first complete one's education and to gain independence before having the first child. The data show that most respondents living in the same location actually reside in the same household and are younger, do not have a partner yet, let alone being married, and, importantly, are still in education. Therefore, once Model 2 controlled for these compositional differences by introducing familial and especially individual characteristics such as educational attainment and partnership status, the negative effect of living in the same location vanished.

Narrowed down to the essence of this study, the anticipation argument, these three findings lead to an ideal–typical distinction between *three qualitatively different situations*: not anticipating maternal support although it would be feasible, anticipating such support, and not anticipating such support because it would not be feasible. In a further model specification that is very similar to Model 2, I combined the travelling distance indicator to reflect these three groups (same location, within 30 min travelling time, over 30 min travelling time). This specification is shown in Table 3. The strength is remarkable, but rather medium-sized compared to the strength of the other effects. Whereas it is comparable to the strength of, e.g. perceiving strong parental pressure vs. mild parental pressure, and to the strength of a medium level of education vs. a high level of education, it is clearly weaker than the strength of established determinants of fertility such as being married or having been raised in a large family (i.e. three or more siblings) vs. being an only child.

However, to inspect more closely how the living distance affects the timing of the decision to become a mother (i.e. respondent either declaring having tried to become pregnant during the last 12 months or being pregnant at the time of the interview), I extended the specification of Model 3 interacting the categories of travelling distance with the process time. The results are shown in Model 4 as well as graphically in Fig. 2 using predicted probabilities. This model specification refines the previous findings in three ways. First, the functional form differs between those who do not live within the same location and those who do. Whereas those who live at a distance feature the known inverted U-shape (resembling the baseline rate specification of Models 1–3), which increases over time and then declines, those who do almost remain at a constantly low level. This adds to the earlier discussion that living with the mother does not constitute a suitable situation to have the first child, indicating that this holds across the whole span of observation. Second, this specification confines the differences between living within 30 min of travelling time and more than 30 min shown before to the time window between 19 and 32 years (confidence intervals overlap before and thereafter). Furthermore, it shows that the differences between these two categories increase over time, more

Table 3 Discrete-time hazard models for women's transition to making the decision to have the first child ($N = 3155$)

	Model 3		Model 4	
	Est.	SE	Est.	SE
Mother lives within (ref.: more than 30 min)				
Same location	.01	(.15)	7.00	(1.79)**
Up to 30 min travel time	.54	(.14)***	5.07	(2.09)*
Process time				
Years ^a	.18	(.08)*	1.27	(.30)***
Years squared	– .00	(.00)	– .05	(.01)***
Mother lives within × process time				
Same location × years			– 1.28	(.32)***
Same location × years squared			.05	(.01)***
Up to 30 min travel time × years			– .77	(.36)*
Up to 30 min travel time × years squared			.03	(.01)*
Person-years		11,427		11,427
Events		434		434

Data are from the German Family Panel (pairfam), own calculations, weighted results. Logistic regression coefficients are shown. Standard errors in parentheses. The models are based on 20 sets of imputed data. Controls are the same as in Model 2, and their coefficients were almost identical

[†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

^aYears since age 15 (age 15 denotes the first year)

precisely from 3.7 to 6.5 percentage points. Third, from age 32 onwards, the effects seem to level off, as the differences between the categories disappeared. Taken together, Model 4 provides evidence for an age-dependent positive impact of being able to anticipate (flexible) maternal childcare support. A concluding example should make this clear. A 28-year-old average woman living within 30 min of travelling time to her mother is with a probability of 11% more than two times as likely to decide to have her first child as a woman of the same age who lives more than 30 min away and for whom the models predicts a probability of 5.3%.

5 Discussion

Based on theoretical arguments from sociology, economics, and evolutionary biology, this study explored whether women who anticipated future childcare support from their mothers were more likely to make the decision to have their first child. The timing of this decision was operationalized using a twofold approach, with respondents either declaring having tried to become pregnant during the last 12 months or being pregnant at the time of the interview. Empirical evidence based on discrete-time hazard models ($N = 3155$) using six waves from the German

Fig. 2 Age-dependent predicted probabilities for women to decide to have the first child ($N = 3155$). *Note:* data are from the German Family Panel (pairfam), own calculations, weighted results. Predicted probabilities based on Model 4. All variables at their means, except distance measure and process time

Family Panel revealed that a proxy measure of anticipation of such support positively influenced the transition rate to the decision for motherhood. More precisely, while it was shown that this impact concentrated on the age span 19–32, the probability to make the decision was twice as high for those women thought to anticipate support compared to those who were not.

Anticipated maternal childcare support was approximated using detailed ordinal information on its primary precondition: geographical proximity, measured as the travelling (or living) distance between the adult daughter and her mother. Although this strategy has been employed by previous research (Arránz Becker and Lois 2013; Hank and Kreyenfeld 2003), I provided the first empirical investigation of both whether it approximated this anticipation at all and whether travelling distance was endogenous to the decision for parenthood. The empirical evidence suggested that the approximation of anticipated childcare support from the woman's mother by means of travelling distance was warranted.

This study contributes to the literature on intergenerational relationships and fertility decision-making in two ways. First, more generally, it corroborates previous sociological and demographic research in pointing out the importance of social interaction for fertility decisions. Importantly, however, it goes beyond previous

contributions in this specific line of research by demonstrating its effectiveness at the earliest point in time in women's fertility histories, at the decision to make the transition to motherhood. This was possible by exploiting a measure of proceptive behaviour rather than either the timing of a live birth or the timing of the conception leading to a live birth, which are the events typically employed.

Second, more specifically, it more accurately estimated the strength of a social interaction effect between adult daughters and their mothers at the transition to parenthood (Arránz Becker and Lois 2013; Hank and Kreyenfeld 2003). I achieved this using two novelties. On the one hand, the effect was net of maternal (or parental) pressure for grandchildren, which was necessary to control for when approximating anticipated maternal childcare using travelling distance to the mother, because travelling distance and social pressure were thought to be negatively correlated. Therefore, not controlling for social pressure would likely overestimate the effect (due to multiple imputation, an empirical test of this contention was not possible as it would have involved a comparison of nested but not same-sample logistic regression coefficients). On the other hand, the effect of anticipated childcare support from the woman's mother was calculated only for whom it applied to due to a comprehensive sample selection. The results of the multivariate analyses showed that the situation in which flexible maternal childcare support would have been theoretically expected to be the highest also featured characteristics known to discourage the decision to become a parent very strongly, primarily being enrolled in education (Blossfeld and Huinink 1991). Consequently, measures that incorporate living in the mother's household into the operationalization of anticipating childcare support would likely underestimate its effect.

This study had some empirical limitations. First, although I was able to exploit an extraordinarily rich indicator of geographical proximity (net of social pressure), it remained a proxy for anticipated maternal childcare support and did not allow for statements about the actual availability of the future grandmother (i.e. the likelihood of realization), which is likely part of the formation of an anticipation. Using available information, I controlled for basic characteristics of the mother such as her age, conflict with her daughter, and number of children. Other important characteristics that have been shown to affect the likelihood of grandmothers' provision of childcare in the presence of grandchildren, like her labour market attachment, health, number of other grandchildren, education, and partnership status (Hank and Buber 2009; Kaptijn et al. 2013), were not available due to the survey design. Furthermore, it is very likely that the individual strength of anticipation varies with the envisioned amount of support, which I was not able to measure. Second, although the results corroborated the assumption that the travelling distance was not endogenous to fertility at the time the decision was made, the sample on which this conclusion was based included only a fraction of the respondents and only the latest move. To more rigorously test this argument, complete histories of distances between adult daughters and their mothers since they first left home up to their main childbearing ages would be needed. In some years, this will be feasible using the pairfam data. Third, due to the survey design, the sample did not represent

the complete fertile age span. Only ages 15–33 were included. Therefore, it should be noted that the generalizability of the findings is limited to this age span.

The way in which this study contributed to scientific knowledge about social interaction effects on fertility decision-making promotes a very promising avenue for future research. Contributions analysing the nexus between social interaction and fertility decision-making in developed countries remain rather fragmented. Currently, we know from quantitative studies that the most prominent interaction partners like parents, siblings (Lyngstad and Prskawetz 2010), friends (Balbo and Barban 2014), and colleagues (Pink et al. 2014) influence individuals' fertility decisions. Using the results of these studies as input parameters in an integrated account would provide exceptional insights for both demography and sociology. Methodologically, a suitable technique to pursue this goal is an empirically calibrated agent-based model (Billari and Prskawetz 2003). Most importantly, this would allow estimating the societal impact of fertility-relevant social interactions in a counterfactual way on, e.g. the total fertility rate or the mean age at first birth. From this, the strength of the individual influences exerted by the different interaction partners could be compared to determine how they combine into aggregate patterns. With these separate studies available that provide the best individual estimates of social interaction effects to date, perhaps now the time has come to integrate them into a unique analysis.

Lastly, this study emphasizes the continuing importance of the older generation for the fertility decisions of the younger generation. On the one hand, this has become evident from the anticipation argument. Women in the position to anticipate having access to maternal assistance with childcare in the future were more likely to make the decision to have their first child than those whose mothers were not (as easily) available to them. On the other hand, women perceiving strong social pressure from their parents made their decisions faster. Taken together, the findings showed that the older generation was subjected to expectations on the part of the younger generation, but that this also held the other way around—and both directions of expectations were elements of the younger generation's fertility decision-making process.

Compliance with Ethical Standards

Conflict of interest The author has no conflict of interest to declare.

Appendix

See Tables 4, 5, 6, 7 and 8.

Table 4 Discrete-time hazard models for robustness checks

	(0) Model 2		(1) Including DemoDiff		(2) Including both sexes		(3) Including only partnerships	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Process time								
Years ^a	.17	(.08)*	.21	(.08)*	.27	(.06)***	.24	(.10)*
Years squared	-.00	(.00)	-.00	(.00)	-.01	(.02)**	-.01	(.00)
Mother lives within (ref.: more than 60 min)								
Same location	-.06	(.15)	-.02	(.15)	.11	(.12)	-.05	(.17)
Up to 10 min travel time	.34	(.17)*	.31	(.17) ⁺	.42	(.13)**	.39	(.18)*
10–30 min travel time	.62	(.17)***	.57	(.18)**	.51	(.13)***	.54	(.18)**
30–60 min travel time	-.23	(.22)	-.31	(.22)	.04	(.17)	-.29	(.23)
Familial characteristics								
Perceived social pressure (ref.: mild)								
None	-.46	(.20)**	-.42	(.19)*	-.48	(.14)**	-.53	(.20)**
Strong	.59	(.17)**	.53	(.16)**	.43	(.12)***	.64	(.19)**
Conflict with mother	.08	(.15)	.12	(.15)	.20	(.12) ⁺	-.05	(.20)
Mother's age (in years)	-.03	(.01)**	-.04	(.01)**	-.04	(.01)**	-.03	(.01)*
Siblings (ref.: none)								
1	.26	(.17)	.18	(.17)	.06	(.11)	.35	(.18)*
2	.32	(.19) ⁺	.26	(.19)	-.00	(.13)	.42	(.20)*
3+	.89	(.22)***	.82	(.22)***	.47	(.15)**	1.01	(.24)***
Regional characteristics								
Settlement structure (ref.: larger city)								
Rural	.23	(.17)	.27	(.16)	.13	(.12)	.17	(.18)
Periphery (smaller)	.19	(.17)	.28	(.17)	-.06	(.13)	.19	(.18)
Periphery (larger)	.07	(.21)	.12	(.21)	.05	(.15)	-.02	(.22)

Table 4 continued

	(0) Model 2		(1) Including DemoDiff		(2) Including both sexes		(3) Including only partnerships	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE
City (smaller)	-.09	(.19)	.01	(.19)	-.10	(.13)	-.18	(.20)
East Germany	.98	(.14)***	.85	(.14)***	.73	(.10)***	1.06	(.15)***
Individual characteristics								
In a partnership	1.68	(.20)***	1.81	(.19)***	1.95	(.14)***	/	/
Married	1.74	(.15)***	1.69	(.14)***	1.65	(.10)***	1.64	(.14)***
In education	-.52	(.19)**	-.50	(.20)**	-.33	(.14)*	-.56	(.21)**
Importance of professional life	-2.64	(.66)***	-2.57	(.68)***	-2.46	(.48)***	-3.08	(.71)***
Full-time employed	.15	(.14)	.14	(.14)	.08	(.10)	.14	(.14)
Education (ref.: high)								
Low	1.02	(.17)***	.98	(.17)***	.71	(.11)***	.99	(.18)***
Medium	.53	(.14)***	.48	(.13)***	.38	(.10)***	.54	(.14)***
Constant	-4.68	(.78)***	-4.75	(.78)***	-4.87	(.57)***	-4.42	(.83)***
Person years	11,427		11,999		24,541		5,823	
Events	434		455		781		400	
	(4) Including third cohort		(5) Excluding co-residency in cohort 1		(6) Excluding unplanned pregnancies from cohort 1			
	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Process time								
Years ^a	.24	(.05)***	.76	(.18)***	.15	(.08) ⁺		
Years squared	-.01	(.00)***	-.03	(.01)***	-.00	(.00)		
Mother lives within (ref.: more than 60 min)								
Same location	-.17	(.14)	-.30	(.23)	-.08	(.15)		

Table 4 continued

	(4) Including third cohort		(5) Excluding co-residency in cohort 1		(6) Excluding unplanned pregnancies from cohort 1	
	Est.	SE	Est.	SE	Est.	SE
Up to 10 min travel time	.15	(.15)	.39	(.18)*	.39	(.17)*
10–30 min travel time	.46	(.16)**	.64	(.19)***	.62	(.18)***
30–60 min travel time	– .37	(.20)	– .22	(.24)	– .21	(.22)
Familial characteristics						
Perceived social pressure (ref.: mild)						
None	– .42	(.17)*	– .46	(.21)*	– .46	(.19)*
Strong	.61	(.14)***	.58	(.18)**	.68	(.15)***
Conflict with mother	.12	(.14)	– .39	(.21) ⁺	.05	(.16)
Mother's age (in years)	– .02	(.01)*	– .03	(.02)*	– .02	(.01)*
Siblings (ref.: none)						
1	.31	(.15)*	.57	(.19)**	.26	(.17)
2	.28	(.17)	.48	(.22)*	.29	(.20)
3+	.92	(.20)***	.89	(.27)**	.84	(.22)***
Regional characteristics						
Settlement structure (ref.: larger city)						
Rural	.08	(.15)	.21	(.20)	.22	(.17)
Periphery (smaller)	.02	(.15)	.14	(.20)	.16	(.17)
Periphery (larger)	– .11	(.20)	– .07	(.24)	.02	(.21)
City (smaller)	– .10	(.16)	– .09	(.21)	– .08	(.19)
East Germany	.95	(.13)***	1.05	(.17)***	1.02	(.14)***
Individual characteristics						
In a partnership	1.79	(.19)***	2.41	(.35)***	1.66	(.19)***
Married	1.60	(.13)***	1.63	(.15)***	1.69	(.15)***

Table 4 continued

	(4) Including third cohort		(5) Excluding co-residency in cohort 1		(6) Excluding unplanned pregnancies from cohort 1	
	Est.	SE	Est.	SE	Est.	SE
In education	-.43	(.18)*	-.76	(.30)*	-.51	(.19)**
Importance of professional life	-2.96	(.58)***	-3.91	(.72)***	-2.50	(.65)***
Full-time employed	.20	(.12)	.08	(.09)	.16	(.14)
Education (ref.: high)						
Low	.91	(.15)***	.99	(.23)***	1.05	(.18)***
Medium	.35	(.13)**	.48	(.15)**	.54	(.13)***
Constant	-5.04	(.67)***	-6.53	(1.44)***	-4.64	(.59)***
Person years		12,250		4,702		11,341
Events		513		359		427

Data are from the German Family Panel (pairfam), own calculations, weighted results. Logistic regression coefficients are shown. Standard errors in parentheses. All models are based on 20 sets of imputed data

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

^aYears since age 15, with age 15 denoting the first year

Table 5 Relationship between travelling distance and career commitment ($N = 2712$)

Mother lives within	Mean	SE
Same location	.31	(.00) *
Up to 10 min travel time	.26	(.01) ***
10–30 min travel time	.25	(.01) ***
30–60 min travel time	.29	(.01)
More than 60 min	.30	(.00)

Difference in mean values is statistically tested against the reference category “more than 60 min”

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 6 Distribution of respondents who changed residence by the number of years that precede the last observation

	Respondents not having made the decision to have a first child		Respondents having made the decision to have a first child	
	Frequency	Percent	Frequency	Percent
Same year	231	40.2	33	50.0
1 year before	166	28.9	14	21.2
2 years before	91	15.9	9	13.6
3 years before	48	8.4	8	12.1
4 years before	38	6.6	2	3.1
<i>N</i>	574	100	66	100

Table 7 Multinomial regression on moving behaviour ($N = 2350$)

	Est.	SE
Remaining below 30-min distance	(Base outcome)	
Remaining beyond 30 min distance		
Decision	– 1.14	(.18)***
Process time	.05	(.01)***
In a partnership	– .03	(.10)
Married	– .11	(.23)
Education (ref.: high)		
Low	– 1.97	(.13)***
Medium	– 1.03	(.11)***
In education	.18	(.11) ⁺
Constant	.50	(.16)**
Moving from beyond to below		
Decision	.67	(.71)
Process time	.19	(.08)*
In a partnership	.52	(1.13)
Married	1.90	(.85)**

Table 7 continued

	Est.	SE
Education (ref.: high)		
Low	− 14.43	(.66)***
Medium	− .07	(.87)
In education	2.94	(.84)***
Constant	− 8.73	(1.50)**
Moving from below to beyond		
Decision	.65	(.47)
Process time	.01	(.04)
In a partnership	.73	(.45)
Married	− 25.01	(.33)***
Education (ref.: high)		
Low	− .44	(.53)
Medium	.21	(.43)
In education	− 1.62	(.69)*
Constant	− 3.58	(.58)***

Note: data are from the German Family Panel (pairfam), own calculations, weighted results. Multinomial logistic regression coefficients are shown. Standard errors in parentheses

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 8 Fertility-relevant characteristics across living distances

Mother lives within	Tie strength to mother ^a		Ideal number of children		Realistic number of children	
	Mean	SE	Mean	SE	Mean	SE
Same location	4.38	(.02) ***	2.12	(.03) ***	1.89	(.02)
Up to 10 min travel time	4.31	(.06)	2.06	(.05)	1.77	(.05)
10–30 min travel time	4.16	(.06)	2.08	(.05)	1.80	(.05)
30–60 min travel time	4.20	(.07)	2.18	(.07)	1.95	(.06)
More than 60 min	4.25	(.03)	2.19	(.03)	1.92	(.02)
<i>N</i>	2889		2845		2649	

^aValues range from 1 = “not close at all” to 5 = “very close”. Difference in mean values is statistically tested against the reference category “more than 60 min”

* $p < .05$, ** $p < .01$, *** $p < .001$

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