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Spatial Immobility Related to the Family

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Do Geographic Proximity to the Parents and Intergenerational Support Exchange Matter for Migration Decisions within Germany?

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Abstract

Research on internal migration, defined as long-distance moves within one country, emphasizes the importance of local ties to the family, in particular to parents, regarding migration decisions. Family members close to the place of residence are considered to constitute local social capital which makes migrating away more costly and, therefore, less likely. Despite empirical support for this general association, so far it is largely unexplained what about family ties exactly binds individuals to a place. I started from the assumptions that intergenerational support is a manifestation of local social capital and that it requires spatial proximity to be exchanged. This work, therefore, used mediation analysis including explicit measures of instrumental and emotional support exchange between parents and their adult children of the cohorts 1971-73 and 1981-83 to explain the negative association between family ties and migration decisions. Logistic regressions are based on several waves of the German partnership and family panel *pairfam*. Living close to parents was indeed negatively associated with migrating a distance of more than 20 kilometres away and part of this association could be explained through one of the proposed mediators. The more instrumental support an adult child received from her/his parent, the less likely she/he was to migrate. Giving support, receiving help with childcare or supporting each other emotionally did not show any significance. Concluding, adult children apparently value the presence of their parents regarding migration decisions especially when they are supported instrumentally while the emotional bond might be well maintained even over larger distances.

Keywords: internal migration; family ties; intergenerational support; spatial proximity; parent-child relationship

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1 Introduction

1.1 Relevance and problem statement

Millions of individuals all over the world are on the move, between and within countries and continents, and they change the shapes of our societies (Niedomysl et al., 2017; United Nations, 2017). However, migrating is costly – financially and emotionally. Our home and the lives we build around it are valuable to us (e.g. Clark et al., 2017). If we migrate we have to leave these valuables behind (DaVanzo, 1981), even if we migrate long distances only within one country, so-called internal migration (Niedomysl et al., 2017). A large body of research focused on economic determinants enhancing or deterring internal migration. Social factors have been shown to influence internal migration to a large extent, too. Having family in close spatial proximity, in particular, appears to decrease the probability of moving drastically (Michielin et al., 2008; Mulder & Malmberg, 2011; Mulder & Wagner, 2012; Mulder & Malmberg, 2014; Ermisch & Mulder, forthcoming). While the importance of family ties in migration decisions seems to be broadly acknowledged, the underlying processes of this relationship are less clear. Evidence was brought up that the decreasing likelihood of migration due to geographically close parents can be partly explained by actual face-to-face contact between parents and their adult children (Ermisch & Mulder, forthcoming). However, it remains unclear why this contact matters. Existing literature, therefore, calls for a direct assessment of the characteristics of family ties that might explain their negative association with the likelihood of migrating (Mulder & Malmberg, 2014).

1.2 Research objective and research questions

This thesis takes intergenerational relationship characteristics into account in order to disentangle the effect of local family ties on the probability of migrating longer distances within a country. Different dimensions of support exchange, in particular the instrumental and emotional dimensions, might mediate and therefore (partly) explain the deterring effect of spatial proximity to the parents on the probability of migrating. Additionally, the role of provision of childcare through the grandparent is considered and analysed as a potential mediator. It is a special aspect of the downward flow, meaning from parents to children, of instrumental support.

Hence, the following research questions will be addressed: What is the effect of living close to parents on the probability of staying for their adult children? Is this association mediated by the frequency of instrumental and emotional support exchange as well as downward flows of caregiving between parents and their adult children? This thesis, therefore, extends the existing body of research through the inclusion of specific relationship characteristics as mediators. Tackling these research questions aims to bring light into the black box of why parents living close by likely bind individuals to their place of residence.

2 Theoretical background and previous findings

2.1 Theory

Internal migration seems to be closely related to location-specific capital (Hjälm, 2014; Mulder & Malmberg, 2014; Clark et al. 2017). Location-specific capital of economic or social nature, also denoted as local ties (e.g. Mulder & Wagner, 2012 or Mulder & Malmberg, 2014), constitutes an asset to an individual that cannot be taken to another location (DaVanzo, 1981). The underlying assumption is that individuals will only migrate when the

expected subjective benefits of the migration will exceed its costs (DaVanzo, 1981). Therefore, the existence of such capital should generally increase the probability of staying (David et al., 2010; Mulder & Wagner, 2012), because moving away from it reduces its assets (Kan, 2007) and therefore increases the cost of migration (DaVanzo, 1981).

Family seems to be a primary source of social capital (e.g. Michielin et al., 2008; Mulder & Malmberg, 2011). Bengtson (2001) argues that multi-generational relationships gained importance in recent years due to an expansion of shared time for multiple generations. Prolonged lives, growing significance of grandparents as caregivers, and strengthened solidarity are the main drivers of the increasing importance of intergenerational family bonds (Bengtson, 2001). Intergenerational relationships are hence a vital source of different dimensions of support, such as emotional and affective support as well as practical support which might be especially important in ageing societies (Bengtson & Roberts, 1991; Hank & Buber, 2009). In order to provide this help, spatial proximity and face-to-face contact between the relevant family members seem to be of crucial importance (Hank & Buber, 2009; Mulder & van der Meer, 2009; Zhang et al., 2012; Ermisch & Mulder, forthcoming). Living spatially close to each other is, therefore, part of the opportunity structure for intergenerational relationships (Bengtson & Roberts, 1991) and is considered a precondition for the exchange of support between parents and their children (Knijn & Liefbroer, 2006; Clark et al., 2017). Mulder (manuscript) also argues that the support exchange provided via face-to-face contact cannot entirely be replaced by technological means and therefore constitutes an indispensable factor in maintaining family relationships. Hence, local ties in general, but family ties in particular, seem to constitute a deterrent of migration (Michielin et al., 2008; Mulder & Malmberg, 2011; Mulder & Wagner, 2012; Mulder & Malmberg, 2014; Ermisch & Mulder, forthcoming). Based on the theory of location-bound capital (DaVanzo, 1981) and the considerations following intergenerational solidarity and its opportunity structure (Bengtson & Roberts, 1991), I hypothesise that *individuals living geographically close to their parents have a smaller likelihood of migrating away compared to individuals not living close to their parents (H1)*.

In order to disentangle the underlying mechanisms of the association between spatial proximity between parents and children and the likelihood of migrating, explicit measures of support exchange need to be considered (Mulder & Malmberg, 2014). These should directly assess the bond between parents and adult children and they assumingly mediate the association between living geographically close to parents and the likelihood of migrating. Support exchange is therefore considered manifestations of local social capital constituted through family. Ermisch & Mulder (forthcoming) accounted for frequency of face-to-face contact in order to identify intergenerational family bonds. The likelihood of moving distances larger than 40 kilometres was indeed partially explained by frequent contact and high involvement in the neighbourhood. However, to account for the multi-dimensionality of intergenerational solidarity (Roberts & Bengtson, 1991) and diverging needs for actual face-to-face contact in order to provide different kinds of support, frequency of face-to-face contact might be a measure that is still too unspecific. Exchange of instrumental support, which manifests in behaviour such as helping a relative with household tasks (e.g. van Gaalen & Dykstra, 2006), is almost impossible to realise without one being physically present (Knijn & Liefbroer, 2006). In line with the assumption of spatial proximity being a precondition for (some dimensions of) intergenerational support exchange, I hypothesise that *the frequency of instrumental support exchange between parents and their adult children partially mediates the relationship between spatial proximity to the parents and the likelihood of migrating. The more frequently instrumental support is exchanged, the smaller the likelihood of migrating (H2a)*.

One particular component of instrumental support exchange is intergenerational caregiving. In fact, caregiving from parents to their grandchildren seems to be one of the most frequent kinds of intergenerational support flows (Knijn & Liefbroer, 2006). Like instrumental support in general, intergenerational caregiving requires physical presence. Therefore, living spatially close to the parents is also a precondition for the provision of care. The reasoning of how intergenerational caregiving influences the association between spatial proximity to the parents and the likelihood of migrating follows the same ideas as for instrumental support and hence concludes in an analogous hypothesis. Due to data restrictions, I am only able to investigate the role of grandparental childcare provision for migration decisions but not in how far the likelihood of migrating is affected by whether or not an adult child cares for her/his parent. Therefore I hypothesise that *the frequency of grandparental childcare partially mediates the relationship between spatial proximity to the parent and the likelihood of migrating. Individuals receiving care for their children from their parent have a smaller likelihood of migrating compared to individuals without support for childcare (H2b)*.

In contrast to instrumental support exchange, emotional support exchange such as involvement in the personal life (e.g. van Gaalen & Dykstra, 2006) might to some degree indeed be substituted through the usage of information and communication technologies (ICTs) such as internet and smartphones (Sharaievska, 2017). The mediating role of emotional support is assumingly present, but weaker compared to the one for instrumental support. Therefore I argue that *the frequency of emotional support exchange between parents and their adult children partially mediates the relationship between spatial proximity to the parents and the likelihood of migrating, but less strongly than instrumental support does. The more frequently emotional support is exchanged, the smaller the likelihood of migrating (H3)*.

2.2 Previous findings

Previous research found clear evidence in favour of a deterring influence of spatial proximity to the parents on the likelihood of migrating long distances for the United Kingdom (Ermisch & Mulder, forthcoming), Sweden (Mulder & Malmberg, 2011; Mulder & Malmberg, 2014), and the Netherlands (Michielin et al., 2008; Mulder & Wagner, 2012). Individuals and couples in Sweden and the UK were significantly less likely to move long distances of 40 or 50 kilometres, when they lived in short distance to their parents, meaning within two kilometres distance (Mulder & Malmberg, 2014) or within a travel time of one hour (Ermisch & Mulder, forthcoming). For individuals living in the UK, the frequency of physical contact with the parents and interaction with neighbours were negatively associated with the likelihood of migrating away from the parents. However, both of these characteristics did not have such a strong relationship with migration behaviour as living close to the parents. Moreover, those not co-residing with a partner and being older also showed lower propensities of migrating. In contrast, higher education, being a private tenant compared to owning a home or being a social tenant, being not born in the UK, and living in a rural area enhanced moves over 40 kilometres (Ermisch & Mulder, forthcoming).

Mulder and Malmberg (2014) did not investigate the local ties of just one individual but accounted for local ties of both partners for married or cohabiting couples with children in Sweden. They tested two hypotheses of potentially competing local ties for partners against each other: the gender-role model, which hypothesises that family ties are more important for the female partner and work ties for the male partner, and the male-dominance hypotheses, which assumes that the male partner has more bargaining power for any local tie that is considered in the migration decision. Although the authors did not find evidence

for either hypothesis, the strength of the overall association between family ties and the likelihood of migrating was strikingly large compared to the other local ties considered (Mulder & Malmberg, 2014).

Several authors aimed at explaining changes in spatial proximity to the family through the consideration of major life events. Michielin et al. (2008) pointed out that specific life events might generate special needs for support from the family which in turn require geographic closeness between the family member in need and the one(s) willing to help. Therefore, the authors did not only investigate whether local family ties were a deterrent of migration for individuals living close to their kin, but also whether they were a trigger for migration towards family members in the Netherlands. Apart from finding results confirming the association between close spatial proximity to the parents and a smaller likelihood of migrating, the location of the parents seemed to be taken into account especially when the children's own needs increased, for example upon divorce (Michielin et al., 2008). Two papers focussed on the particular case of separation of co-residing couples and the importance of the two partners' local family ties in their migration decisions (Mulder & Malmberg, 2011 for Sweden; Mulder & Wagner, 2012 for the Netherlands). Family ties to the own mother, father, or siblings deterred partners of formerly co-residing married couples or co-residing couples with children in Sweden from moving out of the shared home and also from moving longer distances. The ties of the partner showed the opposite effect. Each partner's resources did not have such a substantial impact on the likelihood of moving (Mulder & Malmberg, 2011). For the Netherlands, these results were replicated. Having at least one parent living in the municipality of the formerly shared home and co-residing with all of the common children was negatively associated with the likelihood of moving (Mulder & Wagner, 2012).

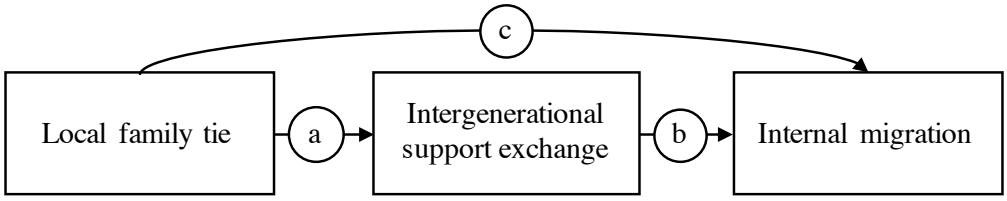
There is some research that investigated the relationship between instrumental support exchange, in particular upward and downward flows of care, and changes of spatial proximity between parents and adult children. Two opposing scenarios have been put forward: one for adults and parents living spatially distant and moving closer when the need for help emerged. One for adults and parents living spatially close and staying close more likely when caregiving in either direction was provided compared to when no caregiving was provided. Especially when the need for functional or instrumental support increased, parents and their children were likely to decrease their spatial distance to each other (e.g. Rogerson et al., 1997; Pettersson & Malmberg, 2009; Smits, 2010). Need for care was a particularly strong deterrent of migration away from the family (Michielin et al., 2008; Hank & Buber, 2009). While Michielin et al. (2008) proxied the potential need for intergenerational support through life events, such as childbirth and age of the parent, I aim at directly assessing the fulfilment of these needs and include them into my analysis.

Despite of a growing body of literature including local social ties into the analysis of internal migration decisions, only little progress has been made towards finding empirical evidence for why these social ties matter (for an exception see Ermisch & Mulder, forthcoming).

2.3 Conceptual model

The conceptual model depicted in Figure 1 summarises the associations that are analysed: Firstly, the effect of local family ties, in particular the ties of the parent, on the migration decision are examined. Secondly, I analyse in how far characteristics of the intergenerational relationship mediate the observed association. Intergenerational relationships are investigated with regard to two broader dimensions: On the one hand, the influence of instrumental support exchange, in general, and grandparental caregiving, in particular, on the primary association is analysed. On the other hand, this association is examined considering exchange of emotional support. The structure of the conceptual model follows the general

Figure 1 - Conceptual model



Source: Own figure based on model of basic causal chain of mediation by Baron & Kenny (1986, Figure 3)

model for mediation analysis with one direct (c) and two indirect paths (a) and (b) (Baron & Kenny, 1986).

3 Data and methods

3.1 Data and sample

I use longitudinal data of the German family panel *pairfam* of waves two to seven (Brüderl et al., 2017). Pairfam is a multi-actor panel study focussing on partnership and family relationships. From 2009 onwards, the survey is conducted annually and does not only address one respondent, the anchor, but also tries to include the respondents' partner(s), up to three (step-)parents, and children as respondents. With this, pairfam aims towards enabling detailed analyses of social relationships from different actors' points of view (Huinink et al., 2011). Pairfam contains extensive information on intergenerational relationships and support exchange as well as retrospective and continuously updated data on changes of residence and information on current distances between the own and the parents' dwelling (Brüderl et al., 2017). Following the example of Ermisch & Mulder (forthcoming), I analyse the association between intergenerational relationship characteristics on the probability of migrating between two subsequent years. In order to analyse the causes of migration, it is essential to use two different points in time and not only compare migrants and non-migrants after they have migrated or stayed but consider characteristics at the time of the migration or just before (Beauchemin, 2014). I cannot analyse migration behaviour in relation to intergenerational relationship characteristics for every wave since questions on support exchange are only included in every second wave from wave two onwards (Thönnissen et al., 2017). Therefore, the analyses are based on waves two and three, four and five, and six and seven with migration behaviour as the dependent variable of every uneven wave *t* and the independent variables of every even wave *t-1*. The baseline sample contained a total of N=18,315 observations. These stem from n=7,934 different individuals that participated in some or all of the three paired waves. In pairfam, participants can skip participation of one wave and re-participate in the next one without being eliminated from the panel (Suckow et al., 2010). Therefore, some participants might be included in the analysis for waves four/five but not necessarily for waves two/three, for instance.

Pairfam is a cohort study including respondents of three different birth cohorts: 1991-93, 1981-83, and 1971-73. Individuals of the youngest cohort have been eliminated from the analysis (38.55% dropped). As they are aged between 16 and 19 years at the first point of analysis, this subsample is supposedly systematically different in its migration behaviour compared to the two older cohorts. In contrast to most of the individuals of the two older cohorts, most members of the younger cohort still co-reside with at least one of their parents (83.46%). The mechanisms underlying migration away from the parents compared to leaving the parental home are probably very different as leaving the nest is a specific step of the

transition into adulthood (Billari & Liefbroer, 2010, for instance). Individuals of the older cohorts co-residing with either of their parents are excluded, too (n=995 dropped). Additionally, only the local ties to biological parents are considered (n=36 dropped).

The sample selection was furthermore restricted due to the following issues: First, some individuals did not have any parents alive in the waves under study (n=453). Another n=217 observations were eliminated as there was no contact with either parent. Unfortunately, for these cases no information on the distance between the child's and the parent's dwelling nor on intergenerational support exchange is available since these questions are only asked if contact to the parent was established. Lastly, some cases had to be excluded due to item non-response of the variables included in the analytical models (n=194). As this number is relatively small and imputations are difficult up to meaningless (for distance to parents, for instance), these cases were dropped. These eliminated observations (in total n=864; 8.45%) are not independent of some socio-demographic characteristics. Compared to individuals of the analytical sample they have received fewer years of education and have more children, on average, even when controlled for the birth cohort. Only in the 1971-73 cohort, males were significantly more often eliminated than kept in the sample. Not surprisingly, excluded individuals are more frequently member of the older birth cohort since with increasing age of the child the parents are more likely to have died. The generalisability of the results is therefore limited and attempts of doing so should be carried out with caution. Eventually, the analytical sample consists of N=9,359 observations for n=4,141 different individuals. A total of n=2,102 participants are selected for all three pairs of waves, while n=1,014 are included in two, and n=1,025 in one of the paired waves.

To analyse the influence of characteristics of the parent-child relationship on migration behaviour, I only take one intergenerational relationship characteristic per case into account even though an individual might have two parents with contact to (see Hank, 2007, for instance). If there is contact with only one parent or only one parent is alive, this parent is selected (n=2,745). The further selection of the parent-child characteristic is dependent on the parents' relationship status. For individuals whose parents do not co-reside (20.37%), one parent and her/his characteristics are included in the analysis. If dwellings of the parents are apart, the bond to only one parent is analysed. Obviously, with this, another potentially strong local tie might be ignored. However, for the sake of simplifying the model to a degree to which results can be meaningfully interpreted, the drawback is considered acceptable. The selection of the parent is based on relationship characteristics that assumingly describe the local tie, and they are ordered according to the likely strength of the local tie. First, for n=709 observations, the parent living closer to the respondent was selected. Next, the parent with a higher total frequency of instrumental support exchange (n=365) and a higher total frequency of emotional support (n=199) was chosen. A higher frequency of contact to the parent decided in n=31 cases which parent to select. For n=13 cases, exchange of care led to the choice of one of the parents. For n=71 parents who lived separately, there are no differences in any of the selection criteria. For those cases, I decided to prefer the mother over the father as it is frequently argued that women are more involved in intergenerational family issues than men, in particular with regard to caregiving and the provision of instrumental support (Knijn & Liefbroer, 2006; Das et al., 2017) and their tie is therefore considered more relevant. Eventually, for n=3,167 cases, the mother is selected for the analysis, while for n=966 observations, the father is considered.

For individuals whose parents do co-reside, the selection procedure is not based on choosing one parent, but on selecting the characteristic of the parent that is more pronounced. This procedure is based on the assumption that – given the dwelling of the parents is shared – any bond to that location has an impact on the migration decision, irrespectively to whom of the parents the characteristic belongs. Therefore, for each relationship characteristic, the

stronger of the two bonds is considered. The selection criteria are the same as for parents not co-residing. In n=1,556 cases, there were no differences between the values of the criteria in the sense that no difference between the intensity of the bond to the mother or the father for these factors is detectable. For the remaining n=3,865 cases, some relationship characteristics to the mother and some to the father are included.

3.2 Dependent variable

Data for the dependent variable describing internal migration behaviour are based on the data set *biomob_ehc* which is included in the scientific use file of *pairfam*. For each wave, the participant's current place of residence, changes of residence between the waves, and the distance between two consecutive dwellings are registered (Brüderl et al., 2017). The migration distance is calculated through a formula for orthodromes using coordinates of the two locations (see p.73 in Brüderl et al. (2017) for a more detailed explanation). Although the exact date of migration is known, too, I only use the information that migration occurred between two waves, as the distance to the parents is only known for the time of the interview. Internal migration in *t* is operationalised as a change of residence between a pair of consecutive waves which equals or exceeds a distance of 20 kilometres. Actual instrumental support exchange was shown to require very small distances of twenty or even five and less kilometres (Knijn & Liefbroer, 2006). Additionally, I defined the independent variable "living spatially close to the parents" (see section 3.3) quite conservative, too, and the migration distance does assumingly not need to be very large in order to decrease the utility of the local social capital of the old residence for the new residence. Therefore, a rather small migration distance is probably sufficient for weakening a family tie, which increases the costs of the migration and therefore should make migration less likely. Furthermore, only very few individuals migrated and the number of migrations decreases with increasing migration distance (see Table 4, Appendix). Opting for a threshold of 20 kilometres increases variation in the dependent variable compared to larger distances. Nonetheless, the practical determination of internal migration (long distance moves) versus residential mobility (short distance moves) remains ambiguous although their causes and consequences are theoretically considered to differ fundamentally from each other (e.g. Niedomysl et al., 2017). In previous literature, a threshold of 40 to 50 kilometres most often defined internal migration while the geographic distance to the parents was defined less strict compared to my proposed threshold, too (Mulder & Malmberg, 2014; Ermisch & Mulder, forthcoming, for instance). Hence, for validation of the results I conduct robustness checks using different thresholds of migration distance and distance to the parents.

3.3 Independent variables

All independent variables, as well as the control variables, are based on the anchor datasets of waves two, four, and six (*t-1*) which temporarily proceed the measurement of migration behaviour. Spatial proximity between the anchor and her/his parents is measured in travel time on a 5-point scale ranging from *we live in the same house* to *3 hours and longer*. A detailed distribution of the original variables and their distribution by migrating at least 20 kilometres can be found in Table 4 (Appendix). I set the threshold of living geographically close to the parents to *less than 10 minutes.* Knijn and Liefbroer (2006) demonstrated clearly that distances of more than five kilometres between parents and children already lead to a reduction of practical support exchange. Descriptive statistics of the variables included in the models are listed in Table 1.

For each of the mediating variables of intergenerational support exchange, one scale measuring support given from children to the parent and one for support received from parent is included (Table 1). Although it might be highly interesting to find out which sorts of

instrumental or emotional support precisely mediate the association between spatial proximity to the parent and migration behaviour, combining them into a scale simplifies the models and therefore reduces data requirements and facilitates interpretation of results. Each scale consists of different items that were assessed on a 5-point scale (originally 1-5, for the analysis *0: Never, 1: Seldom, 2: Sometimes, 3: Often, 4: Very often)*. The following items were selected accordingly to previous research analysing intergenerational relationship types which are based on the solidarity and conflict paradigm (e.g. van Gaalen & Dykstra, 2006).

Frequency of instrumental support given and received was measured through these three questions (displayed for given only; help received was asked analogously): *During the past 12 months, how often did you give help in preparing documents such as tax forms or in taking care of official business?, During the past 12 months, how often did you give help to the following persons with shopping, housework, or yardwork?,* and *During the past 12 months, how often did you give help to the following persons for the purpose of nursing or taking care of family members?*. As care given to the parent within the past 12 months (*yes/no*) predicts the likelihood of not migrating perfectly (see Table 4, Appendix), the influence of an upward flow of care on the likelihood of migrating could not be addressed

Table 1 - Descriptive statistics and proportion of migrations per category (N=9,359)

	Mean		Proportion migrated ≥20km
Migrated ≥20km	0.0105		
Parent lives within 10min travel time: no	0.6128		0.0139
Yes	0.3872		0.0050
Instrumental support given (0-16)	2.7437	(2.2957)	
Instrumental support received (0-12)	1.2745	(1.6809)	
No children <15 years in household	0.3843		0.0156
Parent provided childcare never or seldomly	0.2658		0.0084
Parent provided childcare at least sometimes	0.3498		0.0064
Emotional support given (1-5)	2.7805	(0.9148)	
Emotional support received (1-5)	2.6439	(0.9449)	
Contact at least several times per week: no	0.3821		0.0134
Yes	0.6179		0.0086
Single	0.1700		0.0088
LAT	0.0860		0.0298
Lives with partner	0.7440		0.0086
Cohort 1981-83	0.4449		0.0151
Cohort 1971-73	0.5551		0.0067
Wave 2	0.3781		0.0150
Wave 4	0.3294		0.0094
Wave 6	0.2924		0.0058
Female	0.5662		0.0108
Male	0.4338		0.0101
Years of education	13.5247	(2.9282)	
Born in Germany: no	0.1246		0.0103
Yes	0.8754		0.0105
Lives in rural area (<20.000 inh.): no	0.5254		0.0120
Yes	0.4746		0.0088
Homeowner: no	0.8472		0.0122
Yes	0.1528		0.0007

Note: Standard deviations in parentheses
Source: pairfam, release 8.0 (Brüderl et al., 2017)

directly. Instead, this measure is additionally included in the scale of giving instrumental support (4: yes / 0: no). Constructing average scales for instrumental support given and received was not feasible as the reliability coefficients Cronbach's Alpha were too low (.41 for support given; .34 for support received). Therefore, sum scales were generated. The scale measuring the frequency of giving instrumental support consists of four items and ranges from 0 - *never given/received any support/not applicable* to 16 *–given/received every support very often* ($\bar{x}_{given}$=2.74, sd=2.29). The scale indicating the frequency of receiving instrumental support ranges from 0 to 12 and consists of three items since grandparental childcare is assessed directly and not included in this scale ($\bar{x}_{received}$=1.27; sd=1.68). Both instrumental support scales are skewed to the right (1.23 for given; 1.51 for received).

The frequency of receiving help with childcare from either parent is assessed through the same frequency scale as general support exchange. Individuals not living with children under the age of 15 years were not asked this question. Therefore, the mediator variable distinguishes between individuals who *do not share a household with at least one child under 15 years* (38.43%), who have children and the *parent takes care never or seldomly* (26.58%), and who have children and the *parent takes care at least sometimes* (34.98%). I transformed the original variable into these three categories in order to simultaneously account for the fact that, firstly, many of the respondents are most likely not in need of support with childcare when children are older. Some families might, secondly, rely on grandparental childcare more frequently than others and, lastly, even if the parent does not take care of the grandchild regularly, some families might still value frequent contact for the sake of maintaining a close relationship between grandchild and grandparent (Oppelaar & Dykstra, 2004).

Lastly, an average scale for emotional support exchange was constructed which consists of the following items: *During the past 12 months, how often did you give advice regarding personal problems?* and *During the past 12 months, how often did you talk to the following persons about their worries and troubles?* Cronbach's Alpha exceeded .70 for both directions of support flows (.72 for help given; .78 for help received) and can, therefore, be considered reliable (Schnell et al., 2013). Both scales are almost distributed normally, however slightly more emotional support was reported to be given than received ($\bar{x}_{given}$=2.78, sd=0.91; $\bar{x}_{received}$=2.64; sd=0.94).

In addition to the explanatory and the mediator variables, some control variables are included (Table 1). These indicate socio-demographics that constitute local capital or facilitate migration through higher personal resources. I include a measure for frequency of contact between parent and child as they assumingly need to live spatially close to each other in order to have frequent face-to-face contact (Mulder, manuscript) and face-to-face contact partially explained the likelihood of migrating (Ermisch & Mulder, forthcoming). The variable includes contact concerning visits, letters, phone calls, and similar and is therefore not the most precise indicator for explaining differences with regard to migration probabilities. Nonetheless, it might be a suitable measure for the intensity of the parent-child relationship. The generated dummy variable indicates if individuals had *contact with their parent at least several times per week* (61.79%). Furthermore, one assumingly essential component of local social capital next to the biological family is a co-residing partner. On the one hand, living with a partner probably deters migration because the migration decision becomes more complex since the two partners need to evaluate potentially conflicting costs and benefits of migration together (e.g. Cooke, 2008). On the other hand, having a living-apart-together relationship (LAT) in which the couple does not co-reside might enhance it. Individuals within a LAT might be more likely to migrate with the aim of moving in together (e.g. Krapf, 2017). Partnership status is operationalised through a variable with the categories *single* (17%)*, LAT* (8.60%)*,* and *lives with partner* (74.40%). Migration rates are also known to be

strongly age-dependent (e.g. Bernard et al. 2014). As age in pairfam is very unevenly distributed due to its cohort structure, no measure for age but cohort (*1971-73* vs *1981-83* (44.49%)) and *wave* are included. Together, they indicate the age of the respondent (e.g. Rabe-Hesketh & Skrondal, 2012). Additionally, I control for gender of the respondent (*male* (43.38%)). The empirical evidence for gender differences in migration probabilities is mixed because they seem to be highly dependent on the current life stage and life events, such as moving upon divorce (Mulder & Malmberg, 2011; Mulder et al., 2012) or leaving the parental home (Mulder et al., 2002). As I do not control for life events that are related to migration and only observe the overall association of gender with migration behaviour, the role of gender in my analysis is not very clear. Furthermore, the educational level of the participant measured in *years of education* is included in the analysis ($\bar{x}$=13.52, sd=2.92). Generally, individuals with higher education tend to migrate more frequently (Fischer & Malmberg, 2011) because they can expect that migration financially pays off while this is not so much the case for lower educated (Sjaastad, 1962). Moreover, the models control whether the adult child was *born in Germany* (87.54%) and if the adult child lived in a rural area (*more than 20,000 inhabitants*) (47.46%). It has been shown that the intensity of family ties with regard to migration decisions varied between individuals with different cultural backgrounds (Zorlu, 2009) and that the spatial distance between parents and their adult children was strongly dependent on the degree of urbanisation of the area they lived in (van der Pers & Mulder, 2013). Both of these associations have been explained with varying family norms between cultures and regions. Lastly, local capital is higher for individuals that own a home compared to individuals renting their dwelling. Homeowners have more to lose when they migrate (Fischer & Malmberg, 2001). The variable is coded as a dummy variable distinguishing between *renters* (84.72%) and *homeowners* if the respondent reported to own or co-own the home they lived in.

3.4 Analytical approach

To test my hypotheses, several logistic regression models were estimated in which migration in *t* is the dependent variable *Y*, proximity to the parents in *t-1* is the main independent variable *X*, and intergenerational support exchange in *t-1* are the mediator variables ***M***. Several control variables of *t-1* are included in each model.

The classic approach towards mediation analysis was developed by Baron and Kenny (1986): In a first step, the association between the independent variable *X* and the mediator variables ***M*** and should be tested (path (a) of the conceptual model (Figure 1)). *X* has to influence *Y* through ***M*** in order to consider ***M*** as mediators. Baron and Kenny (1986) propose to use ***M*** as the dependent variable in a regression model with *X* as the independent variable. As for this analysis, there are four different *M*, their relationship to *X* is analysed through bivariate analysis methods. Next, *X* needs to be shown to affect *Y* (path (c)). This regression is being used for testing hypothesis H1 (Model 1). In the last step, *Y* should be explained by running a model with *X* and ***M*** as independent variables (Model 2). If the hypothesised mediator variables ***M*** indeed mediate the association of *X* and *Y,* the estimator for *X* should decrease in its size and significance compared to the first model (Baron & Kenny, 1986). In order to compare the size of an estimator over different models or samples in logistic regression models, the logits or odds ratios must not be compared directly. Any additional independent variables that are associated with *Y* change the size of the estimator of *X* although they might be completely independent of it (Mood, 2010). To investigate whether or not the inclusion of ***M*** leads to a decrease in the estimator of *X*, the average marginal effects (AMEs) of *X* are compared between the two regression models (Mood, 2010). This would mean that ***M*** can indeed explain part of the *X*-*Y* association (H2 and H3).

For my analysis, I worked with STATA (version 15.1) and the commands *logit* and *margins*. Some individuals are included several times in the analysis and the observations of one individual are probably serially correlated which would underestimate standard errors and overestimate significance of the variables (Andreß et al., 2013). Therefore, I controlled for the clustering of observations over respondents.

4 Results

First, the proportions of individuals migrating at least 20 kilometres are descriptively analysed by different values of the independent variables. Next, the inferential analyses are presented accordingly to the steps of the classic approach towards mediation analysis (Baron & Kenny, 1986).

4.1 Descriptive results

Table 1 does not only contain information on the distribution of the dependent and independent variables but as well on the proportion of moves of at least 20 kilometres by their values. These descriptive results are promising with regard to my expectations. Overall, in 1.05% of all the cases, a migration of at least 20 kilometres occurred between two consecutive waves. The proportion of cases in which individuals migrated is much higher for those that did not live within 10 minutes travel time from their parents (1.39%) compared to those who did (0.50%). Additionally, the annual migration rate was smaller when grandparents took care of their grandchildren at least sometimes (0.64%) compared to those only helping seldomly or never with childrearing (0.84%) or those not living with children under the age of 15 years (1.56%). Differences between groups with regard to the partnership status, age, degree of urbanisation and homeownership were also in line with my expectations. However, virtually no difference between migration proportions could be observed between males (1.01%) and females (1.08%) and those being born in Germany (1.05%) compared to those being born abroad (1.03%).

4.2 Spatial proximity to the parent and support exchange (*X-M*)

First, the association between the independent variable distance to the parent and the mediators is analysed. As the independent variable is binary, bivariate analyses were conducted using indifference tables and Pearson χ^2-tests. All of the mediator variables were dependent on the level of *X* on a significance level of p=.05 (Table 2). Following the theoretical argumentation that spatial proximity is a precondition for support exchange between parents and children, the results support the assumption that *X* influences the mediator variables. Step one of the approach towards mediation analysis (Baron & Kenny, 1986) can be considered as fulfilled.

Table 2 - Pearson χ^2-tests for the independent variable and the mediator variables

	Pearson χ^2	p-value	Cramer's V
Instrumental support given	600.505	0.000	0.253
Instrumental support received	592.161	0.000	0.251
Care for grandchild received	598.841	0.000	0.253
Emotional support given	16.915	0.031	0.043
Emotional support received	30.535	0.000	0.057

Source: pairfam, release 8.0 (Brüderl et al., 2017)

4.3 Model without mediators (*X*-*Y*)

Second, hypothesis H1 was tested with the first logistic regression model which does not include the mediator variables ***M***. Table 3 (Model 1) displays the average marginal effects (AMEs) of the estimators. The result empirically supports the hypothesis of a negative association between living spatially close to the parent and the likelihood of migration. The AME of living within 10 minutes travel time to the parent on migrating was -.0068 ($p = 0.003$). Although this estimator seems to be tiny per se, it should be seen in relation to the overall very small migration rate (1.04%) (see Ermisch & Mulder, forthcoming). Individuals living farther away from their parents, therefore, have a considerably higher likelihood of migrating compared to individuals living close to their parents. Next to a significant negative estimator for spatial proximity to the parents, (partly) owning a home strongly reduced the propensity of migrating at least 20 kilometres (AME = -0.0116, $p = 0.000$). Age, too, was negatively associated with migration behaviour since being part of the older cohort and later calendar time (wave) showed negative and significant AMEs. Being in an LAT-relationship compared to not having a partner (AME = 0.0155, $p = 0.003$) and increasing years of education (AME = 0.0013, $p = 0.000$), in contrast, significantly increased the likelihood of migration. These associations are in line with the expectations. The frequency of any kind of contact, migration background, and living in a rural area were, however, not significantly associated with migration behaviour.

4.4 Model with mediators (*X*-*M*-*Y*)

Last, the mediator variables ***M*** were included into the baseline model to test hypotheses H2 and H3 (Table 3, Model 2). The frequency of receiving instrumental support from the parent was significantly associated with the likelihood of migrating. As was hypothesised in H2a, the more instrumental support an adult child received from her/his parent, the smaller was her/his likelihood of migrating (AME = -0.0023, $p = 0.015$). In contrast to my expectations, the frequency of instrumental and emotional support given to as well as receiving emotional support from the parent were not significantly associated with the likelihood of migrating at least 20 kilometres. Additionally, there was no difference between those with and without young children in the household regarding their migration behaviour, irrespectively of whether or not the parent cared for these grandchildren. Hence, hypotheses H2b and H3 need to be rejected.

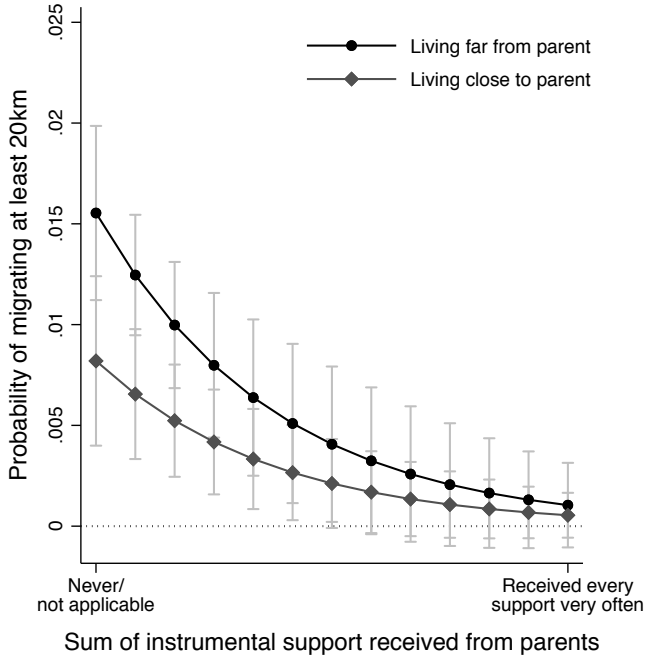
In order to draw any conclusions about the role of support exchange as mediator for the association between proximity to the parents and migration behaviour, I compared the AME of proximity to the parent between model M1 and M2 (Mood, 2010). The AME of living spatially close to the parent on the likelihood of migrating between model M1 and model M2 (AME = -0.0058, $p = 0.013$) decreased by 0.0096 points and in its significance ($\Delta p = 0.010$). Including measures for instrumental and emotional support exchange, therefore, reduced the strength and significance of the estimator for geographic proximity to the parents on migration probability. Thus, part of the main association seems to be explained through downward flows of instrumental support between the generations and hypothesis H2a can therefore be partially supported. Furthermore, the inclusion of the mediators did not have a substantial impact on the significance nor the direction of the other variables of the model despite slightly changing sizes of their coefficients (see Table 3). Figure 2 visualises the predicted probabilities of migrating at least 20 kilometres for individuals living within and farther than 10 minutes travel time from their parents at different frequencies of instrumental support received, all other covariates at their means. It clearly underlines the negative association between receiving instrumental support and the probability of migrating while

Table 3 - Logistic regressions with migrating ≥20km as dependent variable (AMEs)

Distance migrated	(1) Without mediators *≥20km*	(2) With mediators *≥20km*
Parent lives within 10min travel time	-0.0068**	-0.0058*
	(0.0023)	(0.0023)
Instrumental support given	-	-0.0001
		(0.0005)
Instrumental support received	-	-0.0015*
		(0.0007)
Care for grandchild received (ref. no children <15 years in household)	-	
Parent provided childcare never or seldomly	-	-0.0018
		(0.0028)
Parent provided childcare at least sometimes	-	-0.0004
		(0.0029)
Emotional support given	-	-0.0016
		(0.0017)
Emotional support received	-	0.0027
		(0.0016)
Contact to parent at least several times a week	-0.0029	-0.0021
	(0.0025)	(0.0026)
Partnership status (ref. single)		
LAT	0.0155**	0.0152**
	(0.0051)	(0.0051)
Living with partner	0.0012	0.0015
	(0.0024)	(0.0023)
Cohort (ref. 1981-83)		
1971-73	-0.0065**	-0.0058*
	(0.0022)	(0.0023)
Wave (ref. two)		
Wave four	-0.0085**	-0.0083**
	(0.0030)	(0.0030)
Wave six	-0.0121***	-0.0120***
	(0.0028)	(0.0028)
Male	-0.0004	-0.0002
	(0.0022)	(0.0024)
Years of education	0.0013***	0.0013***
	(0.0004)	(0.0004)
Born in Germany	0.0015	0.0019
	(0.0029)	(0.0029)
Rural area	0.0011	0.0014
	(0.0023)	(0.0023)
Homeowner	-0.0116***	-0.0114***
	(0.0014)	(0.0014)
N	9,359	9,359
Number of clusters (n)	4,141	4,141
Pseudo R^2	0.0966	0.1066
Prob. > χ^2	0.0000	0.0000

Note: Standard errors in parentheses (corrected for clustered individuals); *** p<0.001, ** p<0.01, * p<0.05
Source: pairfam, release 8.0 (Brüderl et al., 2017)

Figure 2 - Predicted probabilities of migrating ≥20km at representative values of the frequency of receiving instrumental support



Source: pairfam, release 8.0 (Brüderl et al., 2017)

simultaneously accounting for lower migration propensities for those living close to their parent compared to those living farther away.

4.5 Robustness check

Arguably, the thresholds used for operationalising "moving away" and "living spatially close to the parents" are to some degree arbitrary and therefore disputable (Niedomysl et al., 2017). Van der Pers & Mulder (2013) for example argue that a distance of 20 kilometres to the parents can be considered to still be within daily reach and internal migration was often defined using thresholds of 40 or 50 kilometres (Mulder & Malmberg, 2014; Ermisch & Mulder, forthcoming, for instance). Therefore, I ran my models using several combinations of different thresholds of migration (5, 10, 20, 30, and 40 kilometres) and proximity to parents (within 10 and within 30 minutes travel time) to test for the robustness of the findings. Overall, the pattern of the results remained stable over the models. Including the mediator variables always decreased the negative AME of living close to parents on the likelihood of migrating in its strength and its significance (see Appendix, Table 5 and 6). In all the models, receiving instrumental support from the parent was the only type of support exchange that was significantly associated with the propensity of migrating. However, there are few divergences compared to models 1 and 2: For the combination of living within 30 minutes travel time and the likelihood of migrating more than 5 kilometres (without mediators), living close was not significantly associated with the migration propensity while frequency of overall contact was (Model 11, Table 6). The AME of frequency of overall contact to the parent was also significant in the model of 10 minutes travel time to the parent and migrating at least 5 kilometres without mediators, despite a significant AME for living close to the parent (Model 3, Table 5). Migrating 5 kilometres does probably not change the travel time to the parent so strongly that it would affect the migration decision of the child. For these cases frequency of contact might be a more precise indicator of the intergenerational bond between

parent and child. Overall, the results still can be considered quite stable since the mentioned exceptions can be explained reasonably.

5 Conclusion and discussion

Despite broad acknowledgement of the consideration of the location of family members for migration decisions, the underlying mechanisms of why living in close spatial proximity of family deters migration have only rarely been explored in previous research. In line with existing literature, this research finds support for a strong linkage between local ties of adult children to their parents and the likelihood of migrating away for the geographic context of Germany. Additionally, I was able to partly explain this association through instrumental support flows from parents to their children using mediation analysis. I expected that having parents living close by facilitates intergenerational support exchange, in particular instrumental support and grandparental caregiving but less emotional support, and therefore increases the local capital of the current place of residence which makes migration away more costly and therefore less likely.

Living within 10 minutes travel time from the parent strongly reduced the likelihood of migrating at least 20 kilometres. In accordance with my general expectation, introducing direct measures of intergenerational support exchange decreased the strength of this association. This supports the idea that intergenerational support flows can partly explain why local ties to parents matter to migration decisions. Although I expected any kind and direction of support to be negatively associated with the likelihood of migrating, only receiving instrumental support from the parent decreased it. In contrast, neither giving instrumental support to the parent, receiving care for the own child from the parent, nor any direction of emotional support exchange showed a significant association with migration behaviour.

Apparently spatial proximity might not be a precondition for exchanging emotional support. Keeping in touch via telephone, smartphone, or internet might indeed be sufficient for maintaining the relationship. Therefore, mutual emotional support could matter less for migration decisions than support that requires physical presence. Furthermore, the direction of support provision seems to be highly relevant for migration decisions for which the location of the parents is considered. Previous literature showed that especially when the needs of the adult children changed, upon divorce or the birth of a child, for instance, distance to the parents was decreased while this was not so much the case for changing needs of the parents (Michielin et al., 2008). This might explain the null-result of the frequency of giving instrumental support despite the perfect prediction of not migrating when an adult child cared for her/his parent which was included in this measure. Maybe, only receiving support contributes to the local social capital which in turn deters migration away from this location. Giving support to someone else might not be considered so valuable that it has an impact on migration decisions. Considering this argumentation, it is even more surprising to not find a significant association between grandparental caregiving and the likelihood of migrating. The direction of influence of the presence of children and the role or grandparents as informal caregivers on the likelihood of migrating is complex. On the one hand, families with school-aged children supposedly have smaller migration rates compared to childless or families with very young children as the costs of migration are higher (Fischer & Malmberg, 2011; Ermisch & Mulder, forthcoming). Simultaneously their need to be taken care of by the grandparent should be considerably smaller if not even absent and contact between grandchildren and grandparents was shown to decrease with increasing age of the grandchild (Geurts et al., 2009). On the other hand, however, younger children do not have the bond to school but are still in need of caretaking. Therefore, the variable in the model might not be

differentiated enough to disentangle the effect between a higher likelihood of staying because of obligations towards school or because of dependencies towards the parent as caregiver for younger children. The associations might equal each other out.

Another possible explanation for this finding might be inverse causality. Families or individuals might conduct adjustment moves towards parents in anticipation or response of becoming parents as they know they cannot live too far away from their parent if they want to receive informal help with childcare (Michielin et al, 2008). In general, the direction of the relationship between geographic proximity to the parent and the likelihood of migrating might well be inverse to what I hypothesised (see Michielin et al., 2008 for a paper that examined the location of parents as deterrent of and attraction factor for migration). Moreover, unobserved characteristics of the sample persons, such as valuing close family relationships, for instance, might influence proximity to the parents, the mediators and the likelihood of migrating (endogeneity). This would mean that the results cannot be interpreted causal but they are just significant due to the lack of relevant variables in the models. Testing for this problem empirically, however, is difficult (see Ermisch & Mulder (forthcoming) for a first attempt to address potential endogeneity in their analysis). Within the extent of this paper I therefore do not conduct such tests. Instead, I again emphasise the theoretical assumption that spatial proximity to the parents is a precondition for exchanging support, meaning support can only be given when spatial proximity is already established, and therefore, directly and indirectly, functions as a deterrent of migration. Ermisch & Mulder (forthcoming) as well as Heylen et al. (2012) did find empirical indications for this direction of causality in their analyses, too.

There are some limitations concerning the data, sample and variable selection. This analysis used data from the longitudinal multi-actor study pairfam. Such studies are affected by panel attrition, meaning not all respondents continue participating in all waves. One major source of panel attrition is migration because it complicates re-location and therefore re-contacting the respondent at subsequent waves (Buck, 2000; Lepkowski & Couper, 2002). Therefore, the sample might be biased with regard to migration itself and the results should be generalised with caution. Furthermore, the cohort structure of the data results in an awkward age distribution and the sample selection was not completely independent of essential socio-demographics, such as education or number of children. Further research could use sample corrections such as weights in order to mitigate this problem. In addition and in contrast to migration analyses using register data that cover a whole population, the absolute number of migrants within this sample is considerably small. This easily overstretches the data and the number of variables and combinations of variables that could be included in the models was limited (Field, 2009; Mulder & Wagner, 2012).

Another concern are local ties that could not be account for due to lack of suitable variables in the selected waves, such as ties to siblings and friends (Belot & Ermisch, 2009; Mulder & van der Meer, 2009) or to work (Fischer & Malmberg, 2001). I neither had information on duration of residence to use as proxy for these factors or indicate a strengthening of the local capital over increasing time at the place of residence (Fischer & Malmberg, 2001; Ermisch & Mulder, forthcoming). Parents are of course only one source of social capital and local ties to other relevant individuals or the workplace might compete with the tie to the parent or strengthen the bond to the current place of residence even more (Mulder, manuscript). Moreover, not only do single family members influence one's decision to migrate, but intrapersonal relations among these family members, such as between other siblings and the parent, might affect it, too (e.g. Knijn & Liefbroer, 2006; Rainer & Siedler, 2009). Consequently, the strength of the association found between living close to the parent and the likelihood of migrating might be overestimated. It might not exclusively be due to

the presence of parents that one migrates less likely but due to the presence of friends or the place of work that were not accounted for directly.

Concluding, I was able to extend existing research on the relevance of local social ties for internal migration decisions through including direct measures for intergenerational support exchange between parents and their adult children. Using survey data for analysing internal migration behaviour has the crucial advantage of having access to personal information that goes beyond information of register data, such as intergenerational relationship characteristics and personal beliefs or values. Only with these information, a more in-depth analysis of why family ties matter for migration is possible (Buck, 2000) and the research questions could not have been answered. The panel structure of pairfam also enabled the incorporation of information from different points in time which is indispensable when examining the causes of migration (Beauchemin, 2014). Moreover, proposing and testing mediation effects brought some light into the black box of why living close to family, in particular to a parent, deters migration. Adult children seem to value the instrumental support they receive from parents when evaluating whether or not to migrate away. Future research might build upon the presented results especially with regard to the inclusion of further relationship characteristics and other local ties as well as intra-generational relationships. Conducting the analyses for other geographical contexts might reveal in how far the welfare state regime interacts with the relevance of instrumental support flows in migration decisions. It was oftentimes argued that support from the state and the family are interrelated (e.g. Hank & Buber, 2009). The age range of the analytical sample could be extended, as well, in order to be able to investigate the role of caring for the parent in migration decisions. The number of adult children caring for their parents was considerably small since the need for elderly care should be larger for individuals of older birth cohorts.

Although a large part of the association between spatial closeness to parents and the likelihood of migrating is still to be explained the results highlight the importance of the social environment when considering internal migration. More importantly even, this work can be considered an important step towards understanding the underlying mechanism of the binding effect of family. Merely acknowledging that family ties deter migration is not enough if we want to fully grasp how cities and regions are being shaped the way they are. A broader knowledge about the fundamental processes might improve the basis for regional population predictions or decision making regarding planning, for instance.

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Appendix

Table 4 - Proportions of migrations of different distances and distributions of original variables

Variable	Mean	Proportion migrated ≥20km
Migrated ≥20km (n=98)	0.010	
≥5km (n=225)	0.024	
≥10km (n=152)	0.016	
≥30km (n=78)	0.008	
≥40km (n=66)	0.007	
Travel time to parent		
We live in the same house	0.095	0.007
Less than 10 minutes	0.293	0.004
10 to less than 30 minutes	0.222	0.008
30 mins to less than 1 hour	0.116	0.011
1 to less than 3 hours	0.118	0.019
3 hours and longer	0.157	0.020
Care given to parent: no	0.979	1.000
Yes	0.021	0.011
Care for grandchild received		
No children <15 years in household	38.43	0.016
Never	16.08	0.010
Seldom	10.50	0.006
Sometimes	16.14	0.009
Often	12.93	0.005
Very often	5.910	0.002
Frequency of contact		
Daily	0.241	0.006
Several times per week	0.377	0.011
Once per week	0.217	0.015
1-3 times per month	0.111	0.013
Several times per year	0.033	0.013
Less often	0.021	0.005

Source: pairfam, release 8.0 (Brüderl et al., 2017)

Table 5 - Logistic regressions with different threshold of migration distance and 10 minutes travel time to parent (AMEs)

	(3) *≥5km*	(4) *≥5km*	(5) *≥10km*	(6) *≥10km*	(7) *≥30km*	(8) *≥30km*	(9) *≥40km*	(10) *≥40km*
Parent lives within 10min travel time	-0.0109**	-0.0088*	-0.0106***	-0.0089**	-0.0049*	-0.0042	-0.0048**	-0.0043*
	(0.0035)	(0.0036)	(0.0028)	(0.0029)	(0.0020)	(0.0022)	(0.0018)	(0.0019)
Instrumental support given	-	-0.0007	-	-0.0006	-	0.0002	-	0.0000
		(0.0008)		(0.0006)		(0.0004)		(0.0004)
Instrumental support received	-	-0.0036**	-	-0.0025*	-	-0.0024**	-	-0.0020**
		(0.0014)		(0.0012)		(0.0009)		(0.0007)
Care for grandchild received (ref. no children <15 years in household)								
Parent provided childcare never or seldomly	-	-0.0055	-	-0.0012	-	-0.0029	-	-0.0016
		(0.0043)		(0.0036)		(0.0024)		(0.0022)
Parent provided childcare at least sometimes	-	-0.0077	-	-0.0023	-	-0.0006	-	0.0013
		(0.0043)		(0.0035)		(0.0027)		(0.0026)
Emotional support given	-	-0.0006	-	-0.0006	-	-0.0019	-	-0.0025
		(0.0023)		(0.0020)		(0.0016)		(0.0014)
Emotional support received	-	0.0007	-	0.0027	-	0.0024	-	0.0023
		(0.0023)		(0.0019)		(0.0015)		(0.0013)
Contact to parent at least several times a week	-0.0078*	-0.0038	-0.0044	-0.0028	-0.0034	-0.0026	-0.0022	-0.0013
	(0.0037)	(0.0039)	(0.0030)	(0.0031)	(0.0022)	(0.0023)	(0.0020)	(0.0021)
Partnership status (ref. single)								
LAT	0.0274***	0.0266***	0.0213***	0.0210***	0.0131**	0.0127**	0.0107**	0.0106**
	(0.0070)	(0.0068)	(0.0061)	(0.0060)	(0.0046)	(0.0045)	(0.0041)	(0.0041)
Living with partner	0.0070*	0.0084*	0.0043	0.0047	0.0016	0.0020	0.0019	0.0020
	(0.0035)	(0.0034)	(0.0029)	(0.0028)	(0.0021)	(0.0020)	(0.0019)	(0.0019)
Cohort (ref. 1981-83)								
1971-73	-0.0206***	-0.0192***	-0.0124***	-0.0117***	-0.0063**	-0.0052*	-0.0044*	-0.0041*
	(0.0032)	(0.0035)	(0.0026)	(0.0029)	(0.0019)	(0.0021)	(0.0018)	(0.0020)

Table 5 continued

	(3) *≥5km*	(4) *≥5km*	(5) *≥10km*	(6) *≥10km*	(7) *≥30km*	(8) *≥30km*	(9) *≥40km*	(10) *≥40km*
Wave (ref. two)								
Wave four	-0.0172***	-0.0169***	-0.0099**	-0.0096**	-0.0076**	-0.0073**	-0.0066**	-0.0065**
	(0.0044)	(0.0044)	(0.0037)	(0.0037)	(0.0027)	(0.0027)	(0.0025)	(0.0025)
Wave six	-0.0267***	-0.0266***	-0.0169***	-0.0168***	-0.0102***	-0.0100***	-0.0092***	-0.0092***
	(0.0042)	(0.0041)	(0.0034)	(0.0034)	(0.0026)	(0.0026)	(0.0024)	(0.0023)
Male	-0.0009	-0.0020	0.0009	0.0013	-0.0007	-0.0007	-0.0005	-0.0005
	(0.0032)	(0.0035)	(0.0027)	(0.0029)	(0.0019)	(0.0021)	(0.0018)	(0.0019)
Years of education	0.0013*	0.0012*	0.0011*	0.0011*	0.0015***	0.0014***	0.0012***	0.0012***
	(0.0005)	(0.0006)	(0.0004)	(0.0005)	(0.0004)	(0.0004)	(0.0003)	(0.0003)
Born in Germany	0.0050	0.0054	0.0007	0.0013	0.0035	0.0037	0.0030	0.0032
	(0.0041)	(0.0042)	(0.0036)	(0.0036)	(0.0022)	(0.0022)	(0.0021)	(0.0020)
Rural area	0.0032	0.0040	-0.0007	-0.0002	0.0006	0.0009	0.0003	0.0004
	(0.0033)	(0.0034)	(0.0027)	(0.0028)	(0.0020)	(0.0020)	(0.0018)	(0.0018)
Homeowner	-0.0233***	-0.0228***	-0.0155***	-0.0152***	-0.0090***	-0.0088***	-0.0076***	-0.0075***
	(0.0026)	(0.0026)	(0.0022)	(0.0022)	(0.0013)	(0.0013)	(0.0012)	(0.0012)
N	9,359	9,359	9,359	9,359	9,359	9,359	9,359	9,359
Number of clusters (n)	4,141	4,141	4,141	4,141	4,141	4,141	4,141	4,141
Pseudo R^2	0.0864	0.0941	0.0848	0.0913	0.1126	0.1279	0.1044	0.1219
Prob. > χ^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: Standard errors in parentheses (corrected for clustered individuals); *** p<0.001, ** p<0.01, * p<0.05
Source: pairfam, release 8.0 (Brüderl et al., 2017)

Table 6 - Logistic regressions with different threshold of migration distance and 30 minutes travel time to parent (AMEs)

	(11) *≥5km*	(12) *≥5km*	(13) *≥10km*	(14) *≥10km*	(15) *≥20km*	(16) *≥20km*	(17) *≥30km*	(18) *≥30km*	(19) *≥40km*	(20) *≥40km*
Parent lives within 30min travel time	-0.0067	-0.0041	-0.0108***	-0.0086**	-0.0081**	-0.0069**	-0.0072**	-0.0064**	-0.0064**	-0.0058**
	(0.0036)	(0.0037)	(0.0031)	(0.0032)	(0.0025)	(0.0027)	(0.0022)	(0.0024)	(0.0020)	(0.0021)
Instrumental support given	-	-0.0009	-	-0.0007	-	-0.0000	-	0.0002	-	0.0001
		(0.0008)		(0.0007)		(0.0005)		(0.0004)		(0.0004)
Instrumental support received	-	-0.0038**	-	-0.0025*	-	-0.0023*	-	-0.0023*	-	-0.0020**
		(0.0014)		(0.0012)		(0.0010)		(0.0009)		(0.0008)
Care for grandchild received (ref. no children <15 years in household)										
Parent provided childcare never or seldomly	-	-0.0052	-	-0.0014	-	-0.0021	-	-0.0032	-	-0.0019
		(0.0043)		(0.0036)		(0.0027)		(0.0023)		(0.0022)
Parent provided childcare at least sometimes	-	-0.0078	-	-0.0020	-	-0.0000	-	-0.0003	-	0.0016
		(0.0043)		(0.0036)		(0.0031)		(0.0028)		(0.0028)
Emotional support given	-	-0.0004	-	-0.0004	-	-0.0016	-	-0.0019	-	-0.0024
		(0.0023)		(0.0020)		(0.0017)		(0.0016)		(0.0014)
Emotional support received	-	0.0009	-	0.0025	-	0.0024	-	0.0021	-	0.0021
		(0.0023)		(0.0019)		(0.0016)		(0.0015)		(0.0013)
Contact to parent at least several times a week	-0.0093*	-0.0051	-0.0043	-0.0029	-0.0025	-0.0018	-0.0026	-0.0020	-0.0016	-0.0009
	(0.0037)	(0.0038)	(0.0029)	(0.0031)	(0.0024)	(0.0026)	(0.0022)	(0.0023)	(0.0019)	(0.0021)
Partnership status (ref. single)										
LAT	0.0270***	0.0264***	0.0209***	0.0207***	0.0151**	0.0149**	0.0128**	0.0124**	0.0104*	0.0104*
	(0.0070)	(0.0067)	(0.0060)	(0.0060)	(0.0051)	(0.0051)	(0.0045)	(0.0045)	(0.0041)	(0.0041)
Living with partner	0.0072*	0.0085*	0.0045	0.0049	0.0015	0.0017	0.0018	0.0022	0.0020	0.0021
	(0.0035)	(0.0034)	(0.0029)	(0.0028)	(0.0024)	(0.0023)	(0.0021)	(0.0020)	(0.0019)	(0.0019)
Cohort (ref. 1981-83)										
1971-73	-0.0206***	-0.0192***	-0.0123***	-0.0117***	-0.0064**	-0.0058*	-0.0063**	-0.0052*	-0.0044*	-0.0040*
	(0.0032)	(0.0035)	(0.0026)	(0.0029)	(0.0022)	(0.0023)	(0.0019)	(0.0021)	(0.0018)	(0.0020)

Table 6 continued

	(11) *≥5km*	(12) *≥5km*	(13) *≥10km*	(14) *≥10km*	(15) *≥20km*	(16) *≥20km*	(17) *≥30km*	(18) *≥30km*	(19) *≥40km*	(20) *≥40km*
Wave (ref. two)										
Wave four	-0.0173***	-0.0171***	-0.0100**	-0.0097**	-0.0086**	-0.0084**	-0.0076**	-0.0074**	-0.0066**	-0.0066**
	(0.0045)	(0.0045)	(0.0037)	(0.0037)	(0.0030)	(0.0030)	(0.0027)	(0.0027)	(0.0025)	(0.0025)
Wave six	-0.0269***	-0.0268***	-0.0170***	-0.0169***	-0.0122***	-0.0121***	-0.0102***	-0.0101***	-0.0092***	-0.0092***
	(0.0042)	(0.0041)	(0.0034)	(0.0034)	(0.0028)	(0.0028)	(0.0026)	(0.0026)	(0.0024)	(0.0023)
Male	-0.0012	-0.0022	0.0008	0.0012	-0.0004	-0.0002	-0.0006	-0.0007	-0.0005	-0.0006
	(0.0032)	(0.0034)	(0.0027)	(0.0029)	(0.0021)	(0.0024)	(0.0019)	(0.0021)	(0.0018)	(0.0019)
Years of education	0.0014*	0.0013*	0.0011*	0.0010*	0.0012***	0.0012**	0.0013***	0.0013***	0.0011***	0.0011***
	(0.0005)	(0.0006)	(0.0004)	(0.0005)	(0.0004)	(0.0004)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Born in Germany	0.0052	0.0054	0.0016	0.0021	0.0022	0.0025	0.0041	0.0042*	0.0035	0.0036
	(0.0042)	(0.0042)	(0.0035)	(0.0035)	(0.0027)	(0.0028)	(0.0021)	(0.0021)	(0.0019)	(0.0019)
Rural area	0.0024	0.0033	-0.0010	-0.0004	0.0010	0.0014	0.0007	0.0011	0.0003	0.0005
	(0.0033)	(0.0033)	(0.0027)	(0.0027)	(0.0023)	(0.0023)	(0.0020)	(0.0021)	(0.0019)	(0.0019)
Homeowner	-0.0234***	-0.0228***	-0.0155***	-0.0151***	-0.0115***	-0.0113***	-0.0089***	-0.0087***	-0.0076***	-0.0074***
	(0.0026)	(0.0026)	(0.0022)	(0.0022)	(0.0014)	(0.0014)	(0.0013)	(0.0013)	(0.0012)	(0.0013)
N	9,359	9,359	9,359	9,359	9,359	9,359	9,359	9,359	9,359	9,359
Number of clusters (n)	4,141	4,141	4,141	4,141	4,141	4,141	4,141	4,141	4,141	4,141
Pseudo R^2	0.0836	0.0920	0.0848	0.0910	0.0999	0.1091	0.1201	0.1341	0.1107	0.1272
Prob. > χ^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: Standard errors in parentheses (corrected for clustered individuals); *** p<0.001, ** p<0.01, * p<0.05
Source: pairfam, release 8.0 (Brüderl et al., 2017