

Moving in or Breaking Up? The Role of Distance in the Development of Romantic Relationships

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Abstract Most romantic relationships start with a living apart together (LAT) phase during which the partners live in two separate households. Over time, a couple might decide to move in together, to separate, or to remain together while maintaining their nonresidential status. This study investigates the competing risks that partners in a LAT relationship will experience the transition to coresidence or to separation. We consider the amount of time LAT partners have to travel to see each other to be a key determinant of relationship development. For our statistical analyses, we use seven waves of the German Family Panel Pairfam (2008/2009–2014/2015) and analyze couples in the age group 20–40 years. We distinguish between short-distance relationships (the partners have to travel less than one hour) and long-distance relationships (the partners have to travel one hour or more). Estimating a competing risks model, we find that couples in long-distance relationships are more likely to separate than those living in close proximity. By contrast, the probability of experiencing a transition to coresidence is lower for LAT couples in long-distance than for those in short-distance relationships. Interaction analyses reveal that distance seems to be irrelevant for the relationship development of couples with two nonemployed (unemployed, in education or other inactive) partners.

Keywords Living apart together · Long-distance relationships · Transition to coresidence · Separation · Travel time · Relationship progression · Cohabitation

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1 Introduction

Most couples start their partnership with some form of nonresidential dating (Meggiolaro 2010). These living apart together (LAT) relationships have received considerable attention in recent sociological and demographic research. In the (mainly European) literature, the term LAT is used to describe unmarried partnerships in which the partners have an intimate relationship but do not live together (Duncan and Phillips 2010; Kiernan 2004; Heuveline and Timberlake 2004; Mortelmans et al. 2015). Although it has been discussed in the literature whether LAT is an alternative to marriage and cohabitation, the majority of LAT relationships can be seen as a stage on the way to making a stronger commitment and establishing a more institutionalized relationship (Liefbroer et al. 2015). In this sense, LAT is a standard sequence in relationship development, which is often followed by cohabitation and marriage. Although this order might vary for some couples, it seems to be a common pattern of relationship progression (Pasteels et al. 2017). Instead of establishing a joint household, nonresidential relationships can also take a path that leads to separation. But there is little existing research on the question of why some couples increase their investment in their relationship by moving in together, while others break up and a third group keeps their LAT status. We consider the amount of time LAT partners have to travel to see each other to be a key determinant of relationship development. Currently the knowledge about the prevalence of long-distance relationships is limited. Our data on younger birth cohorts in Germany indicate that more than 25% of LAT partnerships have long travel times, defined here as one hour or more. This number is expected to rise in the future because mobility demands of jobs are increasing (Schneider et al. 2008). As it appears that the number of couples who have to travel long distances to see each other is already non-negligible, we are interested in the question of how travel time affects partnership formation and development.

The aim of this study is to contribute to the literature by analyzing the competing risks that a couple in a LAT relationship will either break up or move in together. Most existing studies have considered the transition to coresidence and union dissolution as single events. Analyses on partnership formation have often focused on first unions; i.e., the transition from being single to entering a first coresidential union or a first marriage (Katus et al. 2007; Mulder et al. 2006; Poortman 2007; Kroeger et al. 2015; Konietzka and Tatjes 2014; Cherlin 2014). These papers conceptualized union formation as one step in the transition to adulthood. Other studies have focused on the transition from a LAT to a coresidential union, regardless of the union order (Sassler and Miller 2011; Régnier-Loilier et al. 2009; Régnier-Loilier 2016). By considering moving in and separation as competing events, we take a broader view of partnership development that goes beyond the conventional approach of focusing on one event at a time. Only a few existing studies have analyzed partnership progression by comparing couples who separated, who moved in together or who remained in their nonresidential status (Sassler et al. 2016; Meggiolaro 2010; Régnier-Loilier 2016). Some of these studies have been descriptive (Lois and Lois 2012), or considered relationship developments based on small sample sizes and a short-time window (Dorbritz and Naderi 2012).

For our statistical analyses, we use seven waves (2008/2009–2014/2015) of the German Family Panel Pairfam (2192 relationship-years). We distinguish between short-distance (the partners have to travel less than one hour to see each other) and long-distance relationships (the partners have to travel one hour or more). Estimating a discrete-time competing risks model, we analyze whether couples in long-distance LAT relationships differ significantly from those in short-distance LAT relationships in terms of their separation risk and their risk of entering a coresidential relationship.

2 The Prevalence of LAT Relationships and Distance

In recent years, interest in LAT relationships has increased considerably among social scientists (for an overview, see Mortelmans et al. 2015). However, in the literature the definition of the term LAT relationship has been inconsistent (Lyssens-Danneboom and Mortelmans 2014). We follow Haskey (2005) in defining a LAT relationship broadly as a steady relationship in which unmarried partners live in two separate households. This excludes those couples who have a joint household but one partner lives in a second household during the week because the workplace is too far away for daily commuting. In western European countries, about 10% of the population live in a LAT relationship (Liefbroer et al. 2015). The exact numbers of LAT partnerships differ across countries and also depend on the operationalization (Régnier-Loilier 2015).

There is an ongoing debate about whether the LAT relationship has become a partnership ideal and thus represents an alternative to marriage; or whether the phenomenon is mainly a relationship stage (Duncan et al. 2014). While several studies have argued that LAT relationships are perceived as ideal by some older adults (Roseneil 2006; Levin and Trost 1999; Haskey and Lewis 2006; Duncan et al. 2013; Régnier-Loilier et al. 2009), the empirical findings indicate that most LAT partners plan to live together at some point in the future (Liefbroer et al. 2015), especially among younger respondents (Pasteels et al. 2017). This indicates that the majority of couples perceive being in a LAT arrangement as a temporary stage in the development of their relationship. Evidence showing that the vast majority of LAT couples are young adults (see Fig. 1 for Germany) also suggests that the LAT phase represents a stage in the progression to family formation. In Germany, among couples in their early twenties LAT is the most prevalent partnership form and drops to levels below 10% for respondents in the beginning of the thirties.

A factor that is crucial for the organization of LAT relationships is the travel time between the partners' places of residence. For couples in long-distance relationships, having fewer opportunities to have face-to-face contact is a central issue (Aylor 2003). Studies in social psychology have shown that living far apart is a challenge for partners in a romantic relationship because they tend to have fewer opportunities for physical and sexual intimacy than couples who live together or nearby (Guldner and Swensen 1995). How many couples are in a long-distance relationship is difficult to estimate because most surveys do not contain information on distance. Moreover, the definition of what constitutes a long distance differs

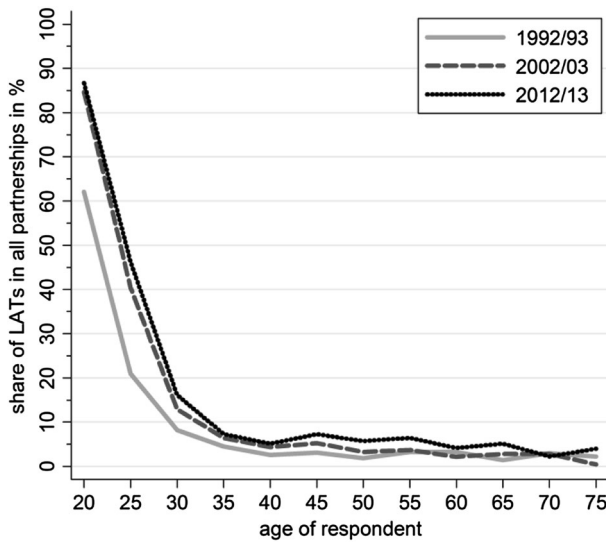


Fig. 1 Share of LATs in all partnerships in Germany 1992/93, 2002/03, and 2012/13. *Note* LAT—living apart together relationships. *Source* German Socioeconomic panel, own calculations. Adapted from Asendorpf (2008)

across studies. Studies for the USA have shown that one-third of college students are in a long-distance relationship (Aylor 2003). For Great Britain, Ermisch and Siedler (2009) estimated that about 12% of LAT partners lived more than 50 miles apart from each other. Unfortunately, in the British Household Panel Survey, there is no clear identification of LAT partners. Thus, the authors had to rely on information about first best friends of the opposite sex that met on a regular basis. Our own calculations based on weighted data from the German Family Panel pairfam indicate that in the survey year 2008/2009, 3.9% of all respondents, and one-fifth of couples in a LAT relationship, were in a long-distance relationship (cf. Table 3 in the “Appendix”). It should be noted, however, that the Pairfam data capture only the cohorts born in 1991–1993, 1981–1983, and 1971–1973.

3 Prior Research Findings

LAT relationships can take different developments: couples can dissolve their union, start to coreside or remain in their LAT status. To our knowledge, no study analyzed these different outcomes for long-distance relationships in a competing risks setting. Empirical research that explicitly accounts for distance between partners focused on union dissolution and was mainly done in the field of psychology. The findings of the studies were mixed. Stafford and Merolla (2007) showed for college students in the USA that long-distance couples were more stable than short-distance couples. Another study on USA couples initially found that long-distance partners were less likely than short-distance partners to have split up (Kelmer et al. 2013). However, in a follow-up survey, it was shown that these

couples were as likely to have separated as their counterparts who were living in close proximity. Another study showed that long-distance couples had higher separation risks than those living in the same city (Cameron and Ross 2007). Related to that, Kley (2015) found higher union dissolution risks for German women who had to commute long distances to work.

A number of studies did take a competing risks perspective but neglected long-distance relationships. A study in the USA shows that half of sexual relationships in the age group 18–39 years had ended by 12 months, while 27% of respondents reported that they moved in together with their most recent sexual partner (Sassler et al. 2016). The authors showed, e.g., that indicators of social class disadvantage were positively related to transitions to coresidence. A study in Italy, that considered direct marriage as another relationship outcome, found a positive association between sexual frequency and entry into cohabitation (Meggiolaro 2010). In a study on French LAT couples, 22% of individuals in a LAT relationship reported that they are still together with their partner within three years (Régnier-Loilier 2016). After six years, the share was reduced to 12%. For Germany, Schnor (2015) found that 24% of couples in a first union and 35% of couples in a higher order union had started living together within the first two years of their relationship. 33% of first and higher order unions had dissolved in the two-year period.

Some studies focus on the transition to coresidence without considering separation. Wagner and Mulder (2015) found some evidence for the relevance of future plans with the partner: couples who intended to marry or to have a child within the next two years were more likely to start coresidence than couples who did not plan to start a family or to marry. This implies that moving in together is part of the general process of family formation. In line with this, research on the transition from being single to cohabiting or marrying has also shown that the decision to share a household is often made in conjunction with other life course events, such as a childbirth or a pregnancy, the completion of education, or a residential move (Guzzo 2006; Lichter et al. 2014). A number of studies have identified motives for establishing a joint household, however without a focus on distance (e.g., Rhoades et al. 2009; Kopp et al. 2010). One qualitative study indicates that partners moved in together because of convenience and because they wanted to improve their housing situation; economic rationales were also mentioned but less prominent (Sassler and Miller 2011).

In sum, the existing literature implies that only little is known about the association between distance and moving in together. Results of prior studies on distance and union dissolution were mixed. Research on the development of LAT relationships without a focus on distance indicates that costs and reward considerations as well as the relationship stage are important elements for establishing a joint household and also for the dissolution of LAT relationships.

4 Theoretical Considerations

In the following, we employ the New Household Economics (Becker et al. 1977; Becker 1981) and Social Exchange Theory (Lewis and Spanier 1979; Rusbult 1980) to derive hypotheses about the association between distance, separation and moving

in together. Both theoretical approaches suggest that relationship decisions are based on cost and benefit considerations of relationship statuses for each partner.

4.1 Long-Distance Relationships and Separation

First, we are interested in the question why some LAT couples remain together, while others break-up. From an exchange theoretical perspective, relationship stability depends largely on relationship quality and barriers to separation (Lewis and Spanier 1979). Because partners in a LAT relationship have not invested into a shared household nor do they have the legal commitments associated with marriage, LAT couples may find it easier to dissolve their union. In line with this, it has been empirically shown that LAT partners who separate experience lower levels of stress and conflict before breaking up than partners in a marital or a coresidential union, especially if they have children (Schneider 1990). In such a situation of low barriers to separate, the quality aspect gains in importance—if the costs of the partnership exceed the rewards (in comparison with an alternative, such as a different partner or being single), the couple breaks up. Also microeconomic considerations, although usually formulated for couples with a joint household, suggest that couples dissolve their union if the (long-run) costs are larger than the (long-run) benefits of the partnership (Becker et al. 1977).

The distance between partners' residences affects the cost of maintaining a LAT relationship and thus the probability of union dissolution. One aspect is the direct cost of travelling, e.g., maintaining a car, paying for a bus, train or plane ticket. Travel is also associated with opportunity costs (Mincer 1963), as the time spent traveling can be used to engage in paid work or other activities only to some extent.¹ In a LAT relationship, the direct and indirect costs of traveling increase with distance; i.e., meeting up is usually more expensive for partners who live far apart than it is for couples who live in closer proximity. An aspect associated with increased psychological cost of long-distance partnerships is travel-related stress. Research on travel to work shows that commuting to a distant workplace on a regular basis is time consuming and that this kind of travel is thus associated with increased stress and a decreased sense of well-being (Stutzer and Frey 2008). Apart from travel-related stress, social psychologists have found that the frequent phases of separation in a long-distance partnership are associated with increased levels of psychological distress (Guldner 1996). Psychological distress may in turn lead to a reduction in the couple's coping capacities and an increase in the risk of separation (Bodenmann and Cina 2006). In sum, maintaining a long-distance relationship is more costly than maintaining a short-distance relationship.

Apart from costs, union dissolution depends also on the rewards of a relationship. The literature on the benefits of long-distance compared to short-distance relationships is somewhat inconsistent. On the one hand, several psychological studies found that college couples in long-distance relationships reported similar (Dargie et al. 2015) or even higher (Kelmer et al. 2013) levels of relationship quality compared to couples who live in close proximity. It has been suggested that in long-distance

¹ Although travelling time can be used in productive ways, less than 25% of respondents under age 45 report that "travel time is very worthwhile" (Urry 2006).

relationships some form of idealization of the partner takes place (Stafford 2005; Jiang and Hancock 2013). If partners do not see each other in everyday situations, they might have a more positive image of each other (Sahlstein 2004). Couples who live far apart may also have fewer conflicts, because, for example, they appreciate the time they spend together more than short-distance partners (Stafford 2005). Having fewer conflicts is associated with higher levels of relationship satisfaction and union stability (Weiß and Wagner 2010). On the other hand, there are reasons to believe that the benefits of a long-distance partnership are lower than they are for conventional couples. Partnerships are rewarding because the partners want to share their lives and spend their time with each other. When the partners live far apart, the opportunities to physically meet and interact are reduced, which negatively affects partnership utility. Although communication technologies, e.g., video calls, are widely used to maintain long-distance romantic relationships, they cannot fully compensate for physical absence. Holmes (2004) has argued that partners who have to travel long distances to see each other might have difficulties in establishing intimacy, because intimacy is by definition related to physical proximity. In interviews, LAT partners have reported that they feel less closeness and intimacy with each other when they are apart, and that they suffer from loneliness and jealousy (Sahlstein 2006). In line with this, German men living in a long-distance LAT partnership reported lower relationship quality compared to cohabiting partners (Feldhaus and Schlegel 2015). This association did not occur among short-distance LATs.

Although the literature is unclear about the association between distance and the rewards of a relationship, the costs of maintaining a long-distance relationship are on average higher compared to short-distance relationships. Therefore, we expect to find that living far apart will increase the probability that a couple in a LAT relationship separates (hypothesis 1).

4.2 Long-Distance Relationships and the Start of Coresidential Unions

Our second research question is why some couples remain in their LAT status while others progress to establishing a joint household. Exchange theoretical ideas suggest that the establishment of a joint household can be seen as investment into a relationship. Investments are partnership specific resources that lose their value (at least partly) in case of separation. For the case of moving in together, the investments could be the joint purchase of furniture, the payment of the cost of moving, etc. Whether a partner invests into the relationship depends on both partnership satisfaction and the quality of alternatives to the relationship (Rusbult 1980). Translated to the establishment of a joint household, couples have a higher probability to move in together if they rate their relationship quality as high and each partner believes that the cost-rewards balance in their relationship is more advantageous compared to alternatives. From a microeconomic perspective, one advantage of forming a common household for couples is the opportunity to profit from economies of scale: pooling resources in a single household usually improves the economic situation of both partners (Becker 1981). If the expected costs of keeping two separate households are larger than the cost of moving in together, partners start to coreside.

Taking into consideration how distance is associated with the start of coresidence is complex because distance affects both the cost of moving and the cost of keeping the LAT relationship. Concerning the cost of moving, research has shown that the greater the distance, the higher the costs. First, the partner incurs costs because he or she has to live farther away from his or her social network of family and/or friends (Dahl and Sorenson 2010; Mulder and Malmberg 2014). The requirement that at least one of the partners gives up his or her local social capital decreases the probability of a move (Kan 2007). Second, the material costs of moving in together can be high for couples who live far apart because the direct expenses of relocation are high (Niedomysl and Fransson 2014; Schwartz 1973). Partners who are employed are attached to the local labor market. Such local ties to work should reduce the probability of migrating (Mulder and Malmberg 2014). Moreover, we assume that finding a new (and adequate) job is more difficult across a great distance. In case that only one partner moves, the question who of the partners moves might be more an issue that needs to be debated and bargained in long-distance than in short-distance couples (see Abraham et al. 2010 for an example of bargaining of migration decisions within coresidential partnerships). At the same time, as already discussed for separation, keeping a LAT relationship is more costly for long-distance than for short-distance couples because the average expenses for commuting are higher. That means that both components that affect the establishment of a coresidential union, i.e., the cost of moving and the cost of commuting, are higher for long-distance than for short-distance couples. We argue, however, that it is difficult for couples to assess the amount of all (including future and past) commuting costs. Therefore, we assume that especially in the beginning of a relationship the high expected cost of a long-distance move leads to a postponement of the transition to coresidence.

In sum, although commuting costs are higher for long-distance couples, we assume that the consequences of a long-distance move are more drastic and thus affect the decision to moving in together to a greater extent than commuting costs. At the same time, starting to coreside is on average less expensive for couples who live in close proximity. Thus, we expect that partners in short-distance relationships are more likely to move in together (compared to remaining in an LAT relationship) than couples in a long-distance relationship (hypothesis 2a). Moreover, in order to account for local ties to work of long-distance couples, we expect that the formation of a joint household depends on partners' labor force status. Nonemployed individuals or those in education are more flexible, and the cost of migrating should be lower for them than for employed partners. Therefore, we expect that moving in together with a long-distance partner is less likely if both partners are employed (hypothesis 2b).

5 Empirical Analysis

5.1 Data

In order to investigate the risk of starting a coresidential union or of ending a LAT relationship, we estimate discrete-time competing risks models. The analyses are

based on longitudinal data from the German Family Panel Pairfam,² release 7.0 (Huinink et al. 2011; Brüderl et al. 2016; Nauck et al. 2014) from 2008/2009 to 2014/2015. The panel is conducted annually among randomly selected men and women in three age groups. The interviewed cohorts were born in 1991–1993, 1981–1983, or 1971–1973. In the first wave, 12,402 respondents (so-called anchors) participated in Pairfam. The prospective design of the study allows us to follow respondents and their partners over a seven-year period. The youngest group of anchor persons was between 15 and 17 years old at the time of the first interview. Romantic relationships in this life stage usually do not lead to coresidential unions in Germany (Konietzka and Tatjes 2014). With our focus on relationship developments of young couples, we consider in our analyses the age group 20–40 years. The sample consists of respondents living in two-sex, nonmarital LAT relationships; i.e., we excluded respondents who were single, married, in a coresidential or a same-sex union when the partnership was first observed. Moreover, because of our focus on the progression of relationships, we considered only those respondents who stated that they had not lived with their current partner before; i.e., we focused on the first coresidence with the current partner. An advantage of Pairfam is that also partners were surveyed and we use information provided by the female partner on her number of children.³ Other characteristics of the partner, e.g., labor force status and age, were reported by the anchor. It has been argued that partnership events—in our case, moving in together and separation—depend on both partners' behavior and characteristics (Kenny and Cook 1999; Zhang and Van Hook 2009). We therefore believe that taking the dyadic perspective improves our understanding of LAT partnership development.

To identify couples in LAT relationships, we selected those respondents who gave an affirmative answer to the question “Do you have a steady relationship at the moment?” The issue of whether it is sensible to compare the development of early-stage dating relationships and long-term LAT relationships has been broadly discussed in the literature. Some authors have chosen to analyze only LAT relationships of a specific duration, ranging from at least six months (e.g., in the study of Ermisch 2000) to two years (e.g., in Castro-Martín et al. 2008). Responses to the question on a “steady relationship” in the Pairfam data allow us to consider the subjective evaluation of the relevance and the stage of a partnership for each anchor person, independent of relationship duration.

5.2 Methods

The events of interest in the discrete-time competing risks model are (a) separation or (b) the transition to coresidence. The process time is partnership duration at the

² This paper uses data from the German Family Panel pairfam, coordinated by Josef Brüderl, Karsten Hank, Johannes Huinink, Bernhard Nauck, Franz Neyer, and Sabine Walper. Pairfam is funded as a long-term project by the German Research Foundation (Deutsche Forschungsgemeinschaft—DFG).

³ Multi-actor designs might produce bias because secondary respondents' participation can be selective. For partners, it has been hypothesized that their participation might be positively related to partnership quality. A study on pairfam indicated, however, that partner participation is independent from partnership quality (Schröder et al. 2013).

time of the interview. We use the information provided in the biopart dataset of Pairfam (Brüderl et al. 2016). These data contain information on the year and the month of the start of the LAT relationship, start of coresidence and the end of a relationship. As we only have information on distance at the time of the interview and not on a monthly basis, we create a relationship-year dataset that includes one observation for each partnership per interview. In our analyses, we consider 2192 relationship-years and 1156 relationships. To adjust for multiple observations of persons, we calculate panel robust standard errors. As can be seen in the bottom rows in Table 1, we observe 391 separations and 505 transitions to coresidence in the data. Most of the couples in our data remained in LAT relationships in-between waves (1296 relationship-years). In the multiple regression analysis, we specified a multinomial logit model for nominal responses (Rabe-Hesketh and Skrondal 2012; Allison 1982). In order to account for the moderating effect of employment status, we run a model with interaction effects between couples' combined employment status and distance. The information on distance and other partnership characteristics (at time t) are used to estimate the competing risk of event occurrence in the following survey waves (at time $t + 1$).

5.3 Explanatory Variables

The key independent variable in our model is the distance between the partners. In the mobility literature, most researchers have used a measure that refers to a one-way distance. There are, however, different measurements. First, in the literature we find a differentiation in the basic unit of interest: some studies have considered the absolute number of kilometers or miles between the places, while others have considered the travel time needed to get from one place to the other (Pfaff 2014; Clark et al. 2003). Others have defined a dichotomous variable to distinguish long from short distances. Again, in the literature we find various suggestions: some authors defined long distance as more than one hour of travel time from the individual's own dwelling to the partner's dwelling, while others have defined it as more than two hours of travel time (e.g., Régnier-Loilier 2015; Dorbritz and Naderi 2012). Sandow (2014) defined long-distance commuters as those who have to travel more than 30 km. In social-psychological studies, authors have often used the self-reported existence of a long-distance relationship (Billedo et al. 2015; Pistole et al. 2010; Guldner and Swensen 1995; Van Horn et al. 1997).

In the Pairfam survey, all of the respondents in a LAT relationship were asked how long it takes them on average to get from their place of residence to their partner's home in terms of hours and minutes.⁴ The responses varied from one minute to 25 hour.⁵ Figure 2 shows that the vast majority of respondents were traveling less than one hour to meet their partner. For the multiple regression analyses, we created a dichotomous variable that takes the value of one for the

⁴ The full question text is: "On average, how long does it take you to get from your place of residence to your partner in hours and minutes? (On a normal day, means of transportation usually used.)"

⁵ In the relationship-year dataset, the travel-time variable has 4.1% missings. The referring observations were excluded from the analysis.

Table 1 Descriptive statistics. Column percent of relationship-years.

	Short-distance LAT (<1 h travel distance)	Long-distance LAT (1 h or more travel distance)	Total
Partnership status at time $t + 1$			
LAT partnership	58.7	60.3	59.1
Coresidence	24.6	18.9	23.0
Separated	16.7	20.9	17.8
Duration of LAT relationship			
<1 year	28.3	29.4	28.6
1 to <2 years	25.5	26.7	25.8
2 to <3 years	15.2	14.7	15.1
3 to <4 years	10.4	10.5	10.4
4 + years	20.7	18.7	18.7
Woman's age (mean)	25.7	25.8	25.7
Woman's age squared (mean)	687.2	694.4	689.2
Man's age (mean)	27.7	27.9	27.8
Man's age squared (mean)	800.3	808.7	802.6
Couple's combined employment status			
Both employed	48.7	36.6	45.4
One employed	34.2	39.7	35.7
Both nonemployed	17.2	23.7	19.0
Children of female partner			
No children	80.8	88.2	82.8
1 or more children	19.2	11.9	17.2
Region			
Western Germany	61.5	62.6	61.8
Eastern Germany	38.5	37.4	38.2
Partnership satisfaction			
Low	29.0	31.4	29.7
Medium	45.6	48.4	46.4
High	25.4	20.2	24.0
Number of partnerships			1156
Number of relationship-years	1593	599	2192
Percent relationship-years	72.7	27.3	100
Number of separations	266	125	391
Number of entries into coresidence	392	113	505

Source Pairfam, male and female anchors and their partner, between 20 and 40 years. Waves 1–7

LAT—living apart together relationships

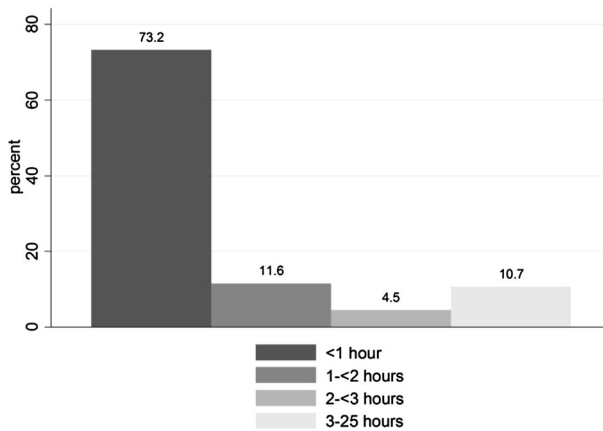


Fig. 2 Average travel time to partner in hours (one-way travel distance). *Source* Pairfam, relationship years, male and female anchors and their partner, age group 20–40 years. Waves 1–7

respondents who were traveling one hour or more, and of zero otherwise. We have also done some sensitivity analyses with other thresholds for long distance, e.g., travel times of 1.5 and two hours. In the multiple regression analysis, this does not change our findings substantially. A specification with three distance categories (<1 h, 1 to <2 h, 2 h or more) showed a significant difference in the regression results between short distances and the other two categories, but no significant difference between the medium and long-distance categories (results not shown here). This indicates that the cost and rewards of medium and long-distance relationships are similar and our 1-hour threshold seems to be empirically acceptable. In our data, 27.3% of the relationship-years had been spent in a long-distance relationship, while 72.7% had been spent in a short-distance relationship (see Table 1).⁶

Another central aspect of the decision to move is partners' local ties to work. We created a three-stage variable for both partners' combined employment status. *Both employed* includes couples with two working partners (full-time or part-time). *One employed* encompasses couples with one working partner and one who is nonemployed (either in education, unemployed or other inactive, e.g., parental leave). The third category refers to couples in which both partners are nonemployed. It would be interesting to differentiate also between combinations of inactive, unemployed and those partners in education. However, with more categories, we ran into sample size problems. In short-distance LAT couples, we find the largest share in the *both employed* category (48.7%), while in long-distance LAT, *one employed* (39.7%) is slightly more frequent than *both employed* (36.6%). The employment status of each partner individually is presented in Table 4 in "Appendix."

In addition to travel time and employment status, we include a number of control variables that might be related to the life course stage of partners and to the

⁶ Figure 5 in "Appendix" illustrates in more detail how the travel time in hours is distributed in the group of long-distance relationships. The findings indicate that only a small share of couples was traveling more than 10 hours to see each other.

progression of their relationship. The distribution of these variables is shown in Table 1. First, we consider the length of the relationship. This is a relevant aspect of both the transition to coresidence and to union dissolution (Asendorpf 2008; Sassler et al. 2016). We define five categories: <1 year, 1 to <2 years, 2 to <3 years, 3 to <4 years, and 4 years or more. This allows us to identify possible nonlinear effects of duration on the start of coresidence or separation. Moreover, we control for the male and the female partner's age and age squared at the time of interview. Another covariate in our models refers to the children of the female partner.⁷ Because the couples in our sample have never been living together, we refer to children from previous relationships. For individuals with resident children, it has been shown that they are less prone to repartner (Poortman 2007) and to coreside with a new partner (Régnier-Loilier et al. 2009) than those who have no resident children. Parents might have a preference to postpone union formation after separation because they anticipate that this is better for their children. Another reason for the negative child effect could be that parents with coresident children are less attractive for potential partners (Beaujouan 2012). Moreover, because family formation patterns in the eastern and the western parts of Germany continue to differ (Konietzka and Tatjes 2014), we control for whether a respondent lives in the east. Finally, we control for partnership satisfaction reported by the anchor person. Following our argumentation in the theoretical section of this paper, we expect that living in a long-distance relationship could produce psychological distress leading to a decrease in the quality of the partnership, and an increase in the risk of separation. We measure relationship quality via the following question: "Overall, how satisfied are you with your relationship?" The scale ranged from zero to 10, and the responses were strongly skewed, with a mean value of 7.9 in our sample. In our models, we distinguish between low (0–7 points: 29.7%), medium (8 and 9 points: 46.4%), and high satisfaction (10 points: 24.0%). Like the other variables, the satisfaction variable was measured in the wave before the information on partnership outcomes was collected.

6 Results

Table 2 presents the results of the discrete-time competing risks model specified as multinomial logistic model. Because the interpretation of the parameters of a multinomial logit model is not straightforward, we present the average marginal effects (AME). The average marginal effect is the mean of the marginal effects for each combination of covariates in the dataset. It represents the average change in the probability of seeing a specific outcome when we alter the respective independent variable from the reference to a different category based on our sample. In the multinomial logistic regression model, the two outcomes of interest are *start of coresidence* and *separation*. The reference outcome in the model is *remaining in a*

⁷ The information on partners' children does not identify whether the children live in the same household. Because most children live with their mother, we use information on female partners' biological children.

Table 2 Multinomial logistic regression model. Average marginal effects

	Start of coresidence	Union dissolution	Remaining in LAT relationship (reference)
Duration of LAT relationship			
<1 year	-0.143***	0.011	0.133***
1 to <2 years	0	0	0
2 to <3 years	-0.045	-0.014	0.059*
3 to <4 years	-0.103***	-0.076***	0.179***
4 + years	-0.065**	-0.035	0.100***
Woman's age	0.040**	-0.015	-0.025
Woman's age squared	-0.001*	0.000	0.000
Man's age	0.081***	-0.013	-0.069***
Man's age squared	-0.001***	0.000	0.001***
Couple's combined employment status			
Both employed	0	0	0
One employed	-0.014	0.000	0.014
Both nonemployed	-0.042*	-0.011	0.053*
Children of female partner			
No children	0	0	0
1 or more children	-0.064***	0.017	0.048
Region			
Western Germany	0	0	0
Eastern Germany	0.006	-0.014	0.007
Partnership satisfaction			
Low	-0.075***	0.158***	-0.084***
Medium	0	0	0
High	0.079***	-0.038**	-0.041
Travel time to partner			
Short distance (<1 h)	0	0	0
Long distance (1 h or more)	-0.061***	0.039**	0.022

LAT—living apart together relationships. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Source: Pairfam, male and female anchors and their partner, between 20 and 40 years. Waves 1–7

LAT relationship, which we present in the right column of Table 2 for the sake of completeness. First, we ran a model with the main effects (Table 2); second, we ran a model with the interaction effect of couples' employment status and distance (Figs. 3 and 4).

The AME on *starting a coresidential union* are presented in the left column in Table 2. Our key independent variable *travel distance* significantly affects moving in together: the average couple in a long-distance LAT relationship was less likely to have moved in together than the average couple who was living in closer proximity (AME = -0.061, $p = 0.01$). For the control variables, we find that the AME of partnership duration is low before the first year ended, increases strongly for the period

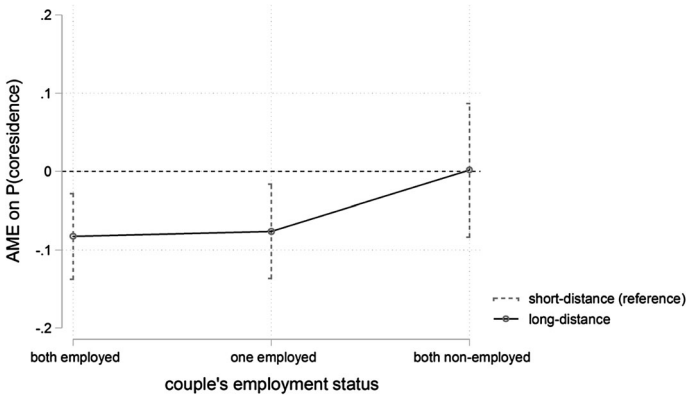


Fig. 3 Interaction effect of distance and couple’s combined employment status on transition to coresidence. Average marginal effects. Control variables: relationship duration, woman’s age, woman’s age squared, man’s age, man’s age squared, children, region, partnership satisfaction

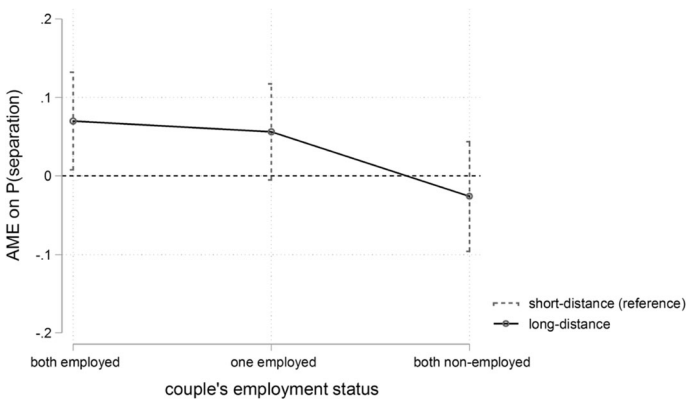


Fig. 4 Interaction effect of distance and couple’s combined employment status on transition to separation. Average marginal effects. *Source* Pairfam, male and female anchors and their partner, age group 20–40 years. Waves 1–7. Control variables: relationship duration, woman’s age, woman’s age squared, man’s age, man’s age squared, children, region, partnership satisfaction

between 1 to 2 years and decreases again thereafter.⁸ The relationship between the partners’ ages and the transition to a coresidential union follows an inverse u-shape. For the employment status of the LAT partners, we find a significant reduction in the predicted probability to move in together among couples who were both nonemployed (AME = -0.042, $p = 0.1$) compared to couples with two employed partners

⁸ In order to account for the investment into a relationship made in the past, it would have been interesting to account for the duration of a long-distance relationship. However, in the pairfam data, for all partnerships that were not observed from the beginning on, we have information only on the overall duration of a relationship, irrespective of the time spent in long or short distance. An interaction effect between partnership duration and distance was largely insignificant (results not shown here).

(reference category). As expected, mothers were less likely to enter coresidence (AME = -0.064 , $p = 0.05$). Our results show no significant differences between respondents living in eastern and western Germany. Partnership satisfaction is significantly related to moving in together: the higher the reported partnership satisfaction, the higher the probability of establishing a joint household.

Turning to the results for the competing event *separation* in the middle column of Table 2, we again find a significant average marginal effect of travel time to the partner's residence. Long-distance couples are more likely to separate compared to those in short-distance (AME = 0.039 , $p = 0.05$). This finding implies that on average, the costs of a long-distance relationship exceed its rewards. This might be related to the argument that emotional closeness is harder to establish across a longer distance, and that the rewards of a partnership are therefore lower in a long-distance than in a short-distance relationship. At the same time, the costs of maintaining the relationship increase with distance. For relationship duration, we do not find a clear pattern for the probability of separation. Moreover, union dissolution is shown to be less likely the older the female partner was, whereas for men, this effect is not significant. For employment status, we find no significant effects on separation indicating that for many LAT couples between the ages of 20–40, partnership development was largely independent of their labor force status. Living in eastern Germany had an insignificant effect on union dissolution. In line with our expectations, partnership satisfaction was negatively related to union dissolution.

In order to improve our understanding of the association between distance, relationship quality and relationship outcomes, we compare the size of AME across models (Mood 2010). From an exchange theoretical perspective, we would expect that partnership satisfaction plays a mediating role between distance and relationship development. Table 5 in the “Appendix” presents the model without controlling for partnership satisfaction. Our calculations reveal that the effect size of distance is slightly reduced after controlling for partnership satisfaction (from AME = -0.068 to AME = -0.061 for start of coresidence). The same pattern is found for union dissolution (reduction from AME = 0.047 to AME = 0.039). An interaction effect between partnership satisfaction and distance yielded insignificant results (not shown here).

To investigate whether partnership development of long-distance relationships depends on a couple's employment situation, we ran interaction models. The interpretation of interaction effects in multinomial regression models is not straightforward, and therefore, we present the AME in graphical form. Figures 3 and 4 illustrate the interaction between both partner's employment status and distance. The dashed horizontal line refers to short-distance couples (reference category). Figure 3 shows that the probability of moving in together is significantly lower among long-distance relationships compared to short-distance relationships if both partners are employed or one partner is employed. In Fig. 4, we see that union dissolution is significantly more likely among long-distance couples if both partners are employed. The AME of distance for couples with one employed partner are only weekly statistically significant ($p = 0.10$), while it is insignificant for those with two nonemployed partners.

7 Discussion

This paper analyzed the partnership progression of couples in nonresidential relationships. Our key independent variable was the distance measured as travel time between the partners' residences. To explain the formation of a common household and the ending of LAT partnerships with respect to proximity, we employed arguments from Social Exchange Theory, and the New Household Economics. In the empirical analyses, we estimated a multinomial logit model to investigate the relative likelihood of separation, starting a coresidential union, or remaining in a LAT relationship.

In our sample, we found that the vast majority (72.7%) of partners in LAT relationships had to travel less than one hour to see each other, i.e., they have a short-distance relationship. In the multiple regression analyses, distance between the partners had a positive effect on union dissolution. Partners in a long-distance relationship were more likely to have separated than those who were living in close proximity. For the establishment of a joint household, we found a negative association with distance. Models with interaction terms revealed that distance was of importance for relationship development among couples with employed partners, but not for nonemployed couples.

These results have implications for our understanding of the development of relationships. First, our findings indicate that distance indeed affects the cost and reward structure of relationships. The negative effect of distance on separation supports the argument that couples, for whom maintaining the relationship is associated with higher costs and lower rewards, are more likely to dissolve their union. The fact that distance negatively affects moving in together implies that long-distance partners on average perceive the costs of migration as higher than the cost of commuting. Second, our data unveiled especially the cost aspect of long-distance relationships. Theoretically, we were assuming that distance increases the cost and reduces the benefits of a relationship. In our regression models, the distance effect was only slightly reduced after controlling for partnership satisfaction (as a proxy for the rewards of a relationship). On the one hand, the reduction shows that the benefits of a partnership are somewhat lower in a long-distance than in a short-distance relationship. On the other hand, the fact that the effect size for distance remained on a comparably high level implies that the cost argument is of greater relevance than the benefits argument for partnership outcomes. A third insight from our analyses is that distance is of importance especially among employed partners. This finding suggests that local ties to work (Mulder and Malmberg 2014) reduce the probability of migrating among long-distance couples and indicates that employed long-distance partners might be those who were defined as "involuntary LAT partners" who would like to live together but are prevented from doing so because their jobs are too far apart (Levin 2004; Pasteels et al. 2017). Moreover, couples with two employed partners who lived in a long-distance relationship were more likely to separate compared to those in close proximity. This result was unexpected because local ties to work have implications especially for migration, but not necessarily for union dissolution. One interpretation of this is that the long-term perspective for relationship development in long-distance dual-career couples is on average less optimistic and thus reduces relationship stability.

Our analyses have several limitations. It has been argued that LAT relationships constitute a very heterogeneous category (Régnier-Loilier et al. 2009; Lois 2012). Based on our analytical strategy, we identified the average patterns of relationship development among LAT partners. However, we were unable to trace the trajectories of subgroups of LAT unions nor did we account for the specific situation of couples who transitioned from a long to a short-distance relationship (such a transition would only be captured as a change on the independent variable in our analyses). Future research should use the potential of sequence analytical techniques and multistate models to take into consideration a broader spectrum of partnership patterns. Such techniques would enable us to investigate also questions about relationship development concerning a larger number of transitions and would thus allow us to analyze whether couples who started living together after having a long-distance relationship separate more quickly than those who had been living nearby. Another shortcoming of our analyses is the potential selectivity of individuals into long-distance relationships. It is possible, for instance, that people with a preference for stable relationships and for a quick establishment of a joint household are less likely to enter a long-distance relationship. If this were the case, the association between distance and relationship outcomes in our analyses might be overestimated. Such unobserved heterogeneity should be taken into consideration in future studies.

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Appendix

Tables 3, 4 and Fig. 5

Table 3 Relationship status of three birth cohorts, pairfam, survey year 2008/2009

Birth cohort	Relationship status					
	Single	Short-distance LAT (<1 h travel time)	Long-distance LAT (1 h travel time or more)	Cohabiting	Married	Total
1991–1993	3889	1166	209	15	1	5280
	73.7%	22.1%	4.0%	0.3%	0.0%	100.0%
1981–1983	1048	524	197	843	687	3299
	31.8%	15.9%	6.0%	25.6%	20.8%	100.0%
1971–1973	735	191	72	586	2176	3760
	19.5%	5.1%	1.9%	15.6%	57.9%	100.0%

Table 3 continued

Birth cohort	Relationship status					
	Single	Short-distance LAT (<1 h travel time)	Long-distance LAT (1 h travel time or more)	Cohabiting	Married	Total
Total	5672	1881	478	1444	2864	12,339
	46.0%	15.3%	3.9%	11.7%	23.2%	100%

Note: LAT—living apart together relationships. Source: pairfam, anchor, wave 1, 2008/2009. Weighted data (design and post-stratification weight *dpxweight*). Author’s own calculations

Table 4 Descriptive statistics. Column percent of relationship-years. Female and male partners’ employment status by distance and for the total sample

	Short-distance LAT (<1 h travel distance)	Long-distance LAT (1 h or more travel distance)	Total
Woman’s employment participation			
Employed (full-time or part-time)	60.8	53.9	58.9
Inactive or unemployed	12.4	6.7	10.2
In education	26.9	39.4	30.3
Man’s employment participation			
Employed (full-time or part-time)	70.7	58.9	67.5
Inactive or unemployed	7.0	5.3	6.6
In education	22.8	35.7	26.0

LAT—living apart together relationships. Source: Pairfam, male and female anchors and their partner, between 20 and 40 years. Waves 1–7

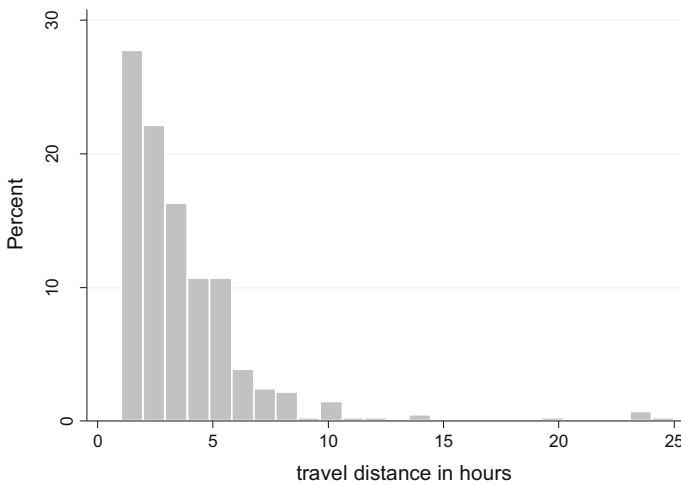


Fig. 5 Distribution of travel time in hours for long-distance LAT couples (i.e., those who travel 1 h or more). Note LAT—living apart together relationships. Source pairfam, relationship years, male and female anchors and their partner, age group 20–40 years. Waves 1–7

Table 5 Multinomial logistic regression model without relationship satisfaction as control variable. Average marginal effects

	Start of coresidence	Union dissolution	Remaining in LAT relationship (reference)
Duration of LAT relationship			
<1 year	-0.135***	-0.001	0.135***
1 to <2 years	0	0	0
2 to <3 years	-0.046	-0.009	0.055*
3 to <4 years	-0.102***	-0.074***	0.176***
4 + years	-0.073***	-0.030	0.103***
Woman's age	0.040**	-0.016	-0.024
Woman's age squared	-0.001*	0.000	0.000
Man's age	0.088***	-0.022	-0.065***
Man's age squared	-0.002***	0.000	0.001***
Couple's combined employment status			
Both employed	0	0	0
One employed	-0.011	-0.004	0.015
Both nonemployed	-0.040	-0.017	0.057*
Children of female partner			
No children	0	0	0
1 or more children	-0.067***	0.024	0.043
Region			
Western Germany	0	0	0
Eastern Germany	0.012	-0.017	0.006
Travel time to partner			
Short distance (<1 h)	0	0	0
Long distance (1 h or more)	-0.068***	0.047**	0.020

Source Pairfam, male and female anchors and their partner, between 20–40 years. Waves 1–7

LAT—living apart together relationships. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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