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Understanding the Reconstruction of Personal Networks Through Residential Trajectories

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Abstract

This article examines how residential trajectories influence the spatiality and composition of personal networks. Three mechanisms are considered: the addition of spatially close network members, the selection of spatially distant network members, and the substitution of spatially distant network members by spatially close ones. An ego-centred network analysis combined with sequence analysis of residential experiences is used to capture the personal networks and the residential trajectories of individuals from two birth cohorts in Switzerland. A series of regression models test the association between the types of personal networks that individuals develop, in terms of both spatial dispersion and composition, and their residential trajectories. The results show that individuals who moved far away from their place of birth are embedded in large and diversified personal networks, which include spatially distant relatives, local nuclear family members, and local friends. On average, individuals who experienced residential migration have larger and more diverse personal networks than individuals who stayed close to their place of birth. The addition mechanism accounts for much of this greater diversity.

Keywords: *residential migration; residential trajectories; personal networks of migrants; network spatiality; social integration; social relationships*

Introduction

The increased geographical mobility of globalised societies may have paradoxical effects on personal networks and consequently on social integration; such effects have – so far – been overlooked. There is a large and relevant literature on the personal networks of migrants, which considers, in particular, the types and amounts of social support activated at a distance (for instance, Mulder & Van der Meer, 2009; Mulder & Cooke, 2009). Evidence on the social support or social capital of migrants (broadly defined as resources stemming from social networks) does not end the

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debates related to their social integration, as the variety of personal networks plays out not only in terms of support received or provided, actual or potential (Herz, 2015; Magdol & Bessel, 2003), but also in terms of the composition of such networks (Lubbers et al., 2010). On the one hand, since the classical work of Litwak (1960), it has been confirmed that geographical mobility is associated with the lasting presence of extended family. The decision to move is rooted in family practices and obligations (Cooke, 2008). Family members are largely present in the composition of migrants' personal networks, despite increasing distances (previous works by the authors, 2017; 2018). On the other hand, several authors argue that distance reduces the normative control of the family (Coleman, 1988; Larsen Axhausen & Urry, 2006) and creates opportunities for "networked individualism" (Wellman et al., 2005, p.165) away from role requirements (Allan, 2001). Thus, personal networks of migrants are expected by some to include a large number of spatially close non-family members and to weaken relationships with the spatially distant family of origin (Ryan, 2007), while others stress the lasting importance of family relationships.

This study tackles the spatiality of personal networks, which is the extent to which such networks are localised or spread out in space. Such spatiality is a crucial component of social integration that has not yet received the attention it deserves, in particular regarding its association with network composition. The role of family relationships in shaping network spatiality indeed deserves further scrutiny. In this article, we first stress the specificity of family relationships in personal networks as such relationships may survive at a distance while also having the potential to be recreated locally. We then describe three spatially sensitive mechanisms of development of personal networks, which may account for their diversity when facing migration: the *addition* of spatially close network members to spatially distant network members, the *selection* of spatially distant network members, and the *substitution* of spatially distant network members by spatially close ones. Residential migration captures the longstanding change in the geographical location of individuals across either national borders (international migration) or between regions within a country (internal or inter-regional migration) – and results in redefining the spaces of daily life (Niedomysl, 2011). We define migrants as individuals who have moved and lived far from their birthplace, in other regions of the country, or in different countries, for a significant period of their lives.

Based on a representative sample of 830 adults from two birth cohorts of individuals living in Switzerland, we assess the extent to which such mechanisms, in relation to family versus non-family relationships, may account for the diversity of personal networks of migrants compared with non-migrants. The discussion stresses the crucial importance of family relationships for understanding the reconstruction of the personal networks of migrants and makes some suggestions for social policies.

The special character of family relationships

Previous studies have confirmed that residential migration is a complex and collective action involving family, kinship, and local communities (Larsen, Axhausen & Urry, 2006; Cooke, 2008; Ryan, 2004). In Switzerland, many people prefer to commute, even if it costs much more time and money than to move homes (previous work by the authors, 2011). Evidence from the literature shows that such choices are motivated by the risk of dissolving family and friendship relationships (Green & Canny, 2003; Vignal, 2002). The continuity of support at a distance and sharing the decision to move with family members can be explained by the special character of family relationships, an explanation that supposes intergenerational solidarity (Bengston & Roberts, 1991)

and responsibilities due to the emotional and practical support shared between family members (Finch & Mason, 1993; Mason, 1999; Morgan, 2013). The definition of a "local family entourage" (Bonvalet & Mason, 1999) characterises the family solidarity that goes beyond the household. These findings are echoed in recent studies focusing on "transnational" families. When migrants face situations in which their local support and local relationships are poor, then distant sources of support and interactions are likely to be activated, even over long geographical distances (Ackers, 1998; Baldassar, 2007; Bryceson & Vuorela, 2003). However, geographical distance influences negotiations about family solidarity. For example, it establishes the limits up to which family members can be asked for practical and emotional support (see, for example, Mulder & Van der Meer, 2009; Mulder & Cooke, 2009). There is also a difference in the readiness and capacity of family members to provide support at a distance. For example, fathers and siblings are less supportive than mothers and children, especially sons, if they live far away (Mulder & Van der Meer, 2009).

Residential migration enlarges personal network geographies (Larsen, Axhausen & Urry, 2006) and provides spatially dispersed personal networks (Wellman, 2001; previous work by the author), including spatially widespread relatives (parents and siblings) and spatially close voluntary kin (e.g., friends) (previous works by the authors, 2017; 2018). The development of technologies, such as mobile phones and high-speed transport, facilitates the maintenance of family relationships at a distance. Contrary to expectations, it does not decrease the role of family members' physical visits for "network activation" (Urry, 2012). According to Mason (2004), visits activate kinship networks over a long distance through the sharing of kinship biographies, doing things together, and negotiating about propriety, morality, and exchange in kin relationships.

Although spatial dispersion has become a feature of families in contemporary mobile societies, relatively little is known about how residential migration shapes the presence of family relationships with regard to other types of relationships in personal networks. From the literature, we hold that the reconstruction of personal networks due to migration progresses through three mechanisms: the *addition* of spatially close network members to spatially distant network members, the *selection* of spatially distant network members, and the *substitution* of spatially distant network members by spatially close network members. The next sections shortly describe such mechanisms.

Addition of spatially close network members to spatially distant network members in personal networks of migrants

The network literature stresses that migrants combine spatially distant strong relationships with family members and nearby weak ties with non-family members (Wellman & Wortley, 1990). It was found that residential migration reinforces the boundaries between family and non-family members in the composition of personal networks. Particularly, residentially mobile individuals are embedded in more transitive support networks, in which network members are highly interconnected, whereas immobile individuals are fostered in highly centralised and less dense support networks characterised by the presence of family members and friends (previous work by the authors, 2012). The social characteristics of migrants, such as age, level of education, and socio-economic status, strongly influence the spatial dispersion of families (Mulder & Kalmijn, 2006; Carasco et al., 2008). The average distance to all family members is greater for young, university-educated, middle-class individuals than for older, less educated and working-class people. The networks of highly educated individuals are balanced between weak ties and far-flung ties with family and friends living elsewhere and connected through communication technologies and social

visits (Urry & Elliott, 2010). Along the same lines, Ryan (2007, 2011) showed that the creation of local relationships is less likely for lowly educated immigrants who have problems with language acquisition and who stay bound to their community of origin within the host country. For example, mothers with children use local friends for tangible support and local knowledge (Ryan, 2007). Thus, the development of local support may influence the extent of support at a distance.

Spatially distant relationships with family members and spatially close relationships with non-family members should be established due to their specific activation for support. The creation of spatially close new relationships with non-family members is warranted because it is unreasonable for practical support or mutual co-presence to have only spatially distant contacts (Larsen, Axhausen & Urry, 2006). Activated by normative commitments, face-to-face meetings, phone calls, and regular visits, family relationships are less sensitive to distance than are relationships with friends, which are more likely to be weakened when distance increases (Bonvalet & Mason, 1999; Coenen-Huther, Kellerhals, Von Allmen, 1994; Lubbers et al., 2010; Pollet, Roberts, & Dunbar, 2013; Wrzus, Hänel, Wagner, & Neyer, 2013; previous work by the authors, 2018). Thus, geographical proximity is related to weak relationships because strong relationships have stronger foundations on which to exist at a distance (Carrasco, Miller, & Wellman, 2008; Wellman & Wortley, 1990).

Some studies connect residential trajectories with other life trajectories to explain the creation of new weak ties or the maintenance of old strong ties. For instance, young adults leaving school and entering the job market tend to reduce their number of weak ties but to increase the overall homogeneity of those ties, as one prefers to maintain intensive relationships with those who are the "same as oneself" (Bidart & Lavenu, 2005). The beginning of a romantic relationship initially favours the addition of new weak relationships shared with the partner. However, when the couple comes to live under the same roof, the number of their network members drops. In addition, the inclusion of friends in personal networks depends on the age of the respondents. Evidence from the British Household Panel Survey showed that young respondents choose friends outside the family, whereas old respondents choose friends within the family (Pahl & Pevalin, 2005).

Overall, the personal networks of migrants include spatially distant and close-by network members due to the migrants' needs for support and on the basis of their social-demographic characteristics and life-course stage. Consequently, an *addition effect* is revealed by the combination of spatially close non-family members and spatially distant family members in the personal networks of migrants.

Selection of spatially distant significant network members in personal networks of migrants

Previous studies have demonstrated that residential migration is associated with the selection of social relationships. The strongest, more intimate relationships with kinship members are maintained over a distance, whereas weaker ties are eliminated (see, for example, Bonvalet & Mason, 1999; Grossetti, 2007). A recent relocation may lead people to focus on a small, emotionally intimate group rather than maintain relationships with a large number of less intimate individuals (Bidart & Lavenu, 2005). A decline in the number of network members depends on the background of migrants and their ability to replenish their networks rapidly. Those who easily adapt to a new social situation are more likely to be open to new sources of personal relationships and are able to create new relationships. The selection of relationships may also be influenced by resources that are necessary for maintaining ties at a distance (previous works by the authors, 2002). A study

conducted in the United States observed that residential migration, which is often related to social mobility and socio-economic status, could be considered an explanatory factor of kinship solidarity (Johnson, 2000). Highly educated people are more likely to be geographically mobile, so they have fewer opportunities to interact with kin than less educated people.

The selection of spatially distant family members predominantly concerns vertical relationships with parents and children. These relationships are more resistant and hence survive at greater distances than relationships with friends, collaterals (siblings, cousins, etc.), and weaker relations (neighbours, colleagues, and other acquaintances) (Bonvalet & Mason, 1999; Coenen-Huther, Kellerhals, Von Allmen, 1994). The selection of relationships may be extended to spatially close family members, including members of the nuclear family, such as partners and children. The selection of relationships at a distance depends on the functions that are fulfilled by these connections. Emotional relationships (Wellman & Wortley, 1990) and the relationships reinforcing the symbolic importance of family (Johnson, 2000) are more selected than the relationships activated by practical support, which are more likely to be replaced by local connections (Wellman & Wortley, 1990).

Friends are less likely to be concerned with selection at a distance because friendship ties are shaped more strongly by individual negotiation than normative expectations of support. Furthermore, maintaining friendship relationships at a distance mostly requires actions (Cronin, 2015) and occasional meetings (Larsen, Axhausen & Urry, 2006). Thus, a *selection effect* is revealed by the presence of spatially distant kin members, such as parents and children, in the personal networks of migrants.

Substitution of spatially distant significant network members by spatially close network members in personal networks of migrants

Residential migration was also found to foster turnover in personal relationships (e.g., Lubbers et al., 2010). This mechanism relates to the substitution or replacement of spatially distant family members, for example, parents, by spatially close family members, uncles and aunts, or by spatially close non-family members, friends, and colleagues. The effect of substitution was confirmed in previous studies, particularly concerning those who provide support to mobile individuals (Mulder & Van der Meer, 2009) and their network composition (Magdol & Besel, 2003). It was found that the practical support and companionship provided by family members are more likely substituted by non-family members with increasing geographical distance from the place of birth (Herz, 2015; Mulder & Van der Meer, 2009). However, non-family members are less likely to substitute for family members with regard to emotional support (Herz, 2015; Magdol & Bessel, 2003). Using panel data on Argentinian migrants in Spain, Lubbers et al. (2010) showed that the structure and composition of migrants' social networks barely change after migration; networks have hardly added Spanish members over time, and they have become only slightly stronger in terms of closeness. In this case, turnover in personal relations was associated with stability in the composition and structure of the networks. Individual characteristics and the length of residence hardly influence the change of networks over time (Lubbers et al., 2010). However, other studies have shown that the length of residence is an additional condition that influences the substitution of kin relationships by non-kin relationships in the personal networks of migrants (Magdol & Bessel, 2003). A recent long-distance relocation impedes exchanges with kin to a greater degree than with non-kin members. However, over time, spatially close non-kin members compensate for the lack of spatially distant kin members (Magdol & Bessel, 2003).

Substitution may also concern friendship relationships because they require more meetings and negotiations (Allan, 1998) as well as their engagement in practical support (Ryan, 2007). However, a qualitative study conducted in the UK showed that intimate friendship ties remain strong after residential migration and are not replaced by new local relationships (Cronin, 2015). Staying in touch with friends at a distance is performed not only through meetings but also through the expression – at a distance – of "sensibilities of friendship" (Cronin, 2015, p. 679). Thus, a *substitution effect* is revealed by an overrepresentation of spatially close kin and non-kin members in the personal networks of migrants.

From this evidence, we hypothesise that residential migration shapes personal networks through addition, selection, and substitution effects. An addition effect is visible when spatially close family members and friends are added to spatially distant ones. A selection effect is present when some specific network members living far away, such as parents or children, are overrepresented in personal networks of migrants compared to other network members. A substitution effect occurs when spatially close relatives and friends are strongly overrepresented in personal networks of migrants compared to spatially distant relatives and friends. Note, however, that these three mechanisms can occur simultaneously and do not exclude each other. This paper aims to gain insight into the presence of such constitutive mechanisms of personal networks using a large and representative dataset of people living in Switzerland, with detailed information on their personal networks and migration trajectories.

Data

We use data from the Family tiMes survey, which includes a representative sample collected in 2011 of 803 individuals from two birth cohorts (1950–1955 and 1970–1975) living in Switzerland. The Family tiMes data offer a unique opportunity to analyse how personal networks are related to life-course trajectories, such as residential migration trajectories because it includes both ego-centred network data and biographical data based on life history calendars. The study combines ego-centred network analysis with sequence analysis of residential experiences from the place of birth.

Ego-centred network data

The ego-centred network consists of a focal actor, termed *ego*, and a set of network members, termed *alters,* who are tied to the ego (Wasserman & Faust, 1999). A free-listing technique was used to delineate the respondents' significant personal relationships (see above). This technique has been used in several surveys devoted to core networks (Marsden, 1987), migrant networks (Herz, 2015; Herz et al., 2019; Lubbers, 2011), and family interdependencies through the Family Network Method (FNM) developed by one of the author's previous works (Author, 1999; 2013; 2000). Respondents were asked to provide a list of persons who were very important to them during the past year, even if the respondent did not get along with them. "Who are the individuals who, over the past year, have been very important to you, even if you have not gotten along well with them?" They were instructed that the term "important" referred to people who have played a role, either positive or negative, in their life during the past year (previous works by the authors, 1999; 2006). This elective citation of significant network members is important for the consideration of personal networks, which not only include individuals closely linked by blood or marriage but also include more inclusive relationships, including friends and non-kin. The personal network size is limited to 19 significant network members. The respondents were also asked to describe the type of relationships they had with these people, choosing from the following categories: partner, children,

parents, siblings, kin members (grandparents, grandchildren, relatives-in-law, uncles and aunts, cousins, nephews and nieces, godparents), friends, and other non-kin members (colleagues, employees, servants, hospital personnel, comrades-in-arms, neighbours, etc.). On that basis, we recoded the variable of personal networks into seven categories: partners, children, parents, siblings, kin members, friends, and other non-kin members.

Spatiality of personal networks data

We computed the geographical distance between the respondent and any significant alter using seven categories: respondent did not cite any significant alter; respondent and alter live in the same household or in the same municipality; respondent and alter live in different municipalities within a distance smaller than 10 km; respondent and alter live within a distance between 11 km and 40 km; respondent and alter live within a distance between 41 km and 100 km; respondent and alter live within a distance between 101 and 500 km; and alter lives abroad. The legal and symbolic distance created by national boundaries encouraged us to use this last category. We then computed the measure of distance for aggregated categories of alters: partners, children, parents, siblings, kin members, friends, and other non-kin members. If the respondent cited two significant network members of the same category, for example, a sister and a brother (who both belong to the sibling category), we computed the average distance between the respondent and the two network members. If the respondent cited three or more significant network members of the same category, for example, two sisters and one brother, or three friends, we took into account the maximum distance among these relatives. In this latter case, we aimed to increase the presence of spatially distant collaterals or friends in personal networks, as according to a study conducted in France (Ogg & Bonvalet, 2004), there is a strong duality in the presence of collaterals and kin relatives in personal networks: one part often lives near, whereas another part lives quite far away.

Life history calendar data

Retrospective life history calendars are used to collect longitudinal data in the survey study. While longitudinal panel surveys are the best means of studying the life course as a process, the life history calendar allows researchers to retrospectively reconstruct this process (Freedman, D. et al. 1988). The respondents were asked: "Now, I would like to know where you have lived throughout your life. Please consider only periods of at least six months." For each semester of age, the life history calendar records the respondent's postcode, tracking their successive places of residence from birth until the time of interview. The road distance (in km) between each place of residence and the respondent's birthplace was inferred using routing software modelling the Swiss road network and recoded into five categories (1. 0–10 km, 2. 11–40 km, 3. 41–100 km, 4. 101–500 km and 5. abroad).

Results

Typology of personal networks in terms of composition and spatiality

We ran a Multiple Correspondence Analysis (MCA) on the variables measuring the geographical distance between the respondent and their significant network members. This exploratory method provides a better understanding of how the response categories are interrelated and can be used to identify underlying patterns (Abdi & Valentin, 2007). Following the standard practice for MCA analysis, we retained five dimensions, which explain the maximum of the variance (Husson et al., 2009). To describe these structuring dimensions, we used the cross-

validation procedure or correlations between the variables considered in MCA and the dimensions (Josse & Husson, 2016). We then performed a hierarchical cluster analysis using the Ward method (Ward, 1963) on the scores of MCA to build a typology of networks in terms of both composition and spatiality.[7] This procedure allows us to go beyond the consideration of one dimension of spatiality and additionally takes into account the composition. The number of clusters was set to six on the basis of standard quality indices.[8]

Table 1 describes the six types of personal networks in terms of composition and spatiality by the percentage of citations of each category of significant network members. The first type, "Local family network" (28%), includes individuals who predominantly cited family members who are spatially close to them (less than 10 km) as significant network members. They are strongly oriented to their partners and cited spatially close children and parents. In this type, siblings, other kin/non-kin members, and friends are largely absent. Focusing on the nuclear family and spatially close parents, this type of personal network excludes other kin and non-kin ties. The mean network size is limited to three individuals who live close to the respondents. The average distance from the respondents to them is 9 km.

The second type labelled "Local friendship network" (27%) includes respondents who cited a very limited number of spatially close network members as significant. When they do so, they predominantly cite spatially close friends and no parents, no children, and no other relatives. In addition, these individuals hardly cited the partner as significant. The mean size of the network is approximately three individuals, all of whom live relatively close to the respondents. The average distance from the respondents to them is approximately 16 km.

We named the third type "Nearby extended network" (19%) as it includes networks of respondents who cited alters who live at quite a distance from them (41–100 km) or spatially close (less than 10 km). They cited children and parents who belong to these two categories of distance. In both cases, they cited siblings or other kin. They also mentioned both spatially close (less than 10 km) and distant friends (41 to 100 km). Individuals in this group frequently cited their partner as a significant network member. The mean network size is about four network members, living on average 29 km from the respondents.

The fourth type labelled "Nationally extended network" (8%) includes individuals who cited their children, parents, siblings, and extended kin who live far from them (101–500 km) within Switzerland. Individuals in this group rarely cited a partner as significant. Most of the cited friends also live far from them (101–500 km). The mean size of the network counts about five individuals living on average 93 km from the respondents.

The fifth type labelled "Internationally extended network" (16%) includes individuals who cited parents, siblings, and extended kin who live abroad. They also cited children and friends who live either spatially close or abroad. Overall, individuals belonging to this type cited both spatially close and distant children and friends and spatially distant members of the family of origin: parents, siblings, and other kin. They rarely cited their partner as significant. The mean network size counts about four individuals living abroad at an average of 209 km from the respondents.

[7] We used the missMDA package in R for dealing with missing values in MCA. The missing values are imputed as categories corresponding to the mean of non-missing values for each variable (Josse & Husson, 2016).

[8] We used the WeightedCluster package in R (Studer, 2013); according to Point Biserial Correlation (PBC), ASW index, CH and CHsq, partitioning in 6 groups is the best solution.

The sixth network type, which we call "Residual type" (2%), due to the small number of cases, was not contributed in the analysis.

Table 1. The description of types of personal networks in terms of composition and spatiality by citation of network members at a distance in %, mean size of networks, and mean distance between respondent and network members.

	Type 1 Local family network N=222, 28%	Type 2 Local friendship network N=213, 27%	Type 3 Nearby extended network N=154, 19%	Type 4 Nationally extended network N=68, 8%	Type 5 Internationally extended network N=130, 16%	Type 6 Residual type (excluded from the analysis) N=16, 2%
Mean size of network	3.47	2.68	4.47	4.60	4.35	5.00
Mean distance between respondent and significant alters, km	8.95	15.69	28.54	92.90	208.79	43.93
Standard deviation	28.28	42.27	25.64	63.28	125.61	73.74
Citation of significant alters at the distance						
Partner				40		
0	10	70	8	59	28	31
1	90	29	88		67	69
2				1	1	
3			2			
4		1	2		2	
5						
6					2	
Children				63		
0	29	87	68	3	49	75
1	3			22	15	6
2	55	4	7	6	16	13
3	8	7	11	4	4	
4		2	11	2	3	6
5	5		3		2	
6					11	
Parents				53		
0	75	96	51		59	47
1				9		47
2	22	2	19		2	
3	3	2	19	4	1	
4			11	29	5	
5				4		
6					34	6

Table 1. Continued.

	Type 1 Local family network N=222, 28%	Type 2 Local friendship network N=213, 27%	Type 3 Nearby extended network N=154, 19%	Type 4 Nationally extended network N=68, 8%	Type 5 Internationally extended network N=130, 16%	Type 6 Residual type (excluded from the analysis) N=16, 2%
Sibling				49		
0	91	85	55		64	38
1						38
2	9	8	9	2	2	
3		7	15	4	2	6
4			20	46	3	
5						
6			1		30	18
Kin				86		
0	84	90	80		80	75
1						13
2	14	7	2	2	4	6
3	2	3	8	2		
4			10	12		
5						
6					16	6
Friends				44		
0	91	43	45		60	25
1				9		63
2	6	32	20	12	12	
3	2	21	15		3	
4	1	3	20	35	3	6
5		1			1	
6					22	6
Non kin				89		
0	97	79	94		82	81
1				4		19
2	2	11	1		4	
3	1	9	3	2	2	
4		1	2	5	8	
5						
6					4	

Note: 0-is not cited as significant; 1- lives in the same household/same municipality, 2- lives at a distance less than 10 km; 3- lives at a distance 11–40 km; 4-lives at a distance 41–100 km; 5- lives at a distance 101–500 km; 6-lives abroad.

Typology of residential trajectories

Sequence analysis techniques are used to capture chronological variations of behaviours such as residential migration at an individual level. Residential trajectories include past and present locations and their characteristics. We constructed types of residential trajectories using sequence analysis to holistically apprehend residential choices from a life course perspective (Heinz et al. 2009). The core programme of sequence analysis may be described in four steps: 1. Constructing sequences of states, 2. Comparing the sequences 3. Grouping the sequences into meaningful types

and 4. Associating these types with some variables of interest (Gauthier J.-A., et al., 2014). Once constructed, the individual sequences are then systematically compared to one another using the optimal matching metric, which quantifies the degree of dissimilarity between all pairs of individual sequences (Kruskal, J., 1983). Next, a clustering procedure is applied to the distance matrix containing the dissimilarity scores to group similar sequences together and produce a typology of migration histories (Ward, J. H., 1963). Standard quality indices are used to help identify the number of groups present in the data (Rousseeuw, 1987). The typology of residential trajectories is used here as an explanatory categorical variable in regression models, while the types of personal networks are included as the dependent variables. Using the same quality indices as for the typology of personal networks, we retain five meaningful types of residential trajectories. Sequence analysis resulted in five types of residential trajectories (Figure 1). A description of the types based on the mean number of semesters spent in each residential category is presented in Table 2.

Figure 1. Typology of residential trajectories from the place of birth

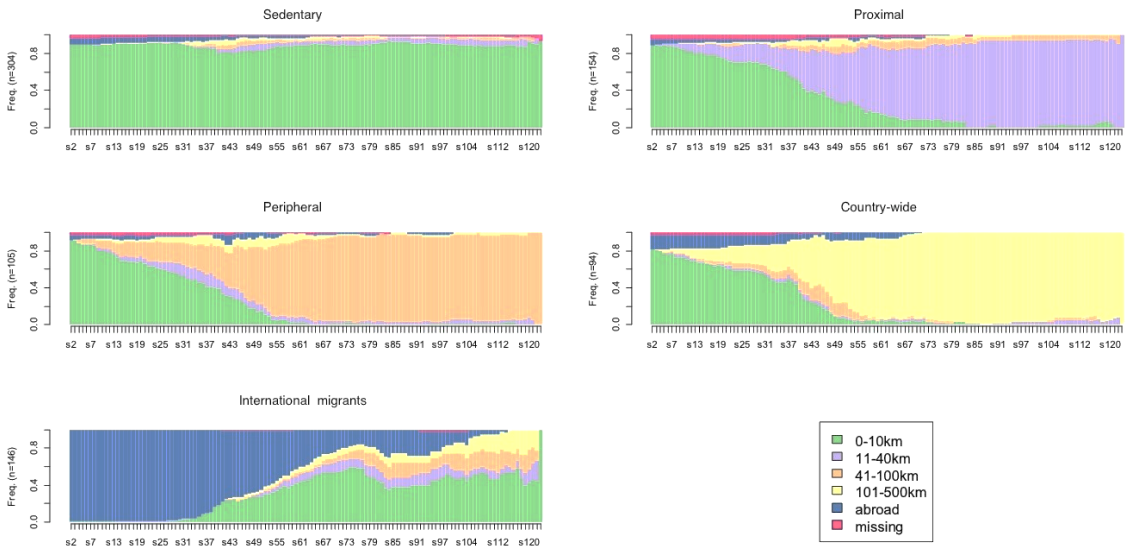

Table 2. Mean time and standard deviation (SD) in semesters spent at each stage by type of residential trajectory

	0-10km	11-40km	41-100km	101-500km	Abroad	Total
Sedentary (N=304)	87.6 (21.4)	3.7 (8.0)	1.9 (5.3)	1.5 (4.4)	3.1(9.3)	97.8
Proximal (N=154)	36.2 (16.2)	48.6 (23.7)	4.1 (8.8)	2.1 (5.3)	2.3 (7.4)	93.3
Peripheral (N=105)	28.8 (15.4)	6.0 (10.8)	60.4 (22.2)	4.2 (7.7)	2.8 (6.2)	102.2
Country-wide (N=94)	26.9 (16.2)	2.8 (7.9)	4.6 (9.1)	61.4 (22.8)	6.5 (12.1)	102.2
International migrants (N=146)	21.4 (16.8)	3.9 (10.0)	3.2 (10.4)	3.0 (9.7)	56.6 (17.9)	88.1

The first type, "Sedentary" (38%), is composed of individuals who have spent most of their life in their birthplace or at a distance of up to 10 kilometres from it. The mean time spent in the category of distance 0-10 km is 87.6 semesters or approximately 44 years. The individuals grouped in the second type, "Proximal" (19%), moved – mainly between the ages of 16 and 30 years – to locations that are up to 11-40 kilometres away from their birthplace. The mean time spent in this category of distance is 48.6 semesters or approximately 24.5 years. In the third type, "Peripheral" (13%), relocation occurs slightly earlier (between ages 15 and 25) and at a distance of 41-100 km from the birthplace. The mean time spent in this category of distance is 60.4 semesters or approximately 30 years. The fourth type, "Country-wide" (12%), reveals a similar pattern regarding the timing of move but is characterised by a relocation within Switzerland at a distance of 101-500 km from the birthplace. The mean time spent in this category of distance is 61.4 semesters or approximately 30.7 years. Finally, the fifth type, "International migrants" (18%), is composed of individuals who migrated to Switzerland, mainly between the ages of 15 and 35. Most of these individuals did not subsequently move far from their first location in Switzerland. The mean time spent in the category "abroad" is 56.6 semesters or approximately 28 years. We consider individuals with trajectories of types "Country-wide" and "International migrants", as well as, to some extent, "Peripheral," as migrants.

Residential trajectories and their relationship to personal networks in terms of composition and spatiality

Logistic regressions are used to assess how the types of personal networks in terms of composition and spatiality are related to types of residential trajectories. The typology of personal networks is used as a dependent variable (Table 3).

People who have many local relationships may have been reluctant to move, arguing for a reverse direction of causality. As network types may shape migration behaviours in return, these regression models cannot be regarded as strictly causal but rather as a way to test the association between residential trajectories and types of personal networks.

Two types of factors that could potentially have a mediating effect between the residential trajectories and the personal networks in terms of composition and spatiality were considered: respondents' socio-demographics and the length of residence in the last region. For socio-demographics, categorical variables were created to control for sex, age, level of education, activity rate and citizenship. For the length of residence in the last region, a continuous variable was created (mean=28.6, SD=17.07). The length of residence in a given place was found to be important for the reconstruction of migrants' personal networks (Cachia & Jariego, 2018; Bidart & Lavenu, 2005; Magdol & Bessel, 2003). However, the reconstruction of personal networks is not a linear process, and major changes in personal networks occur in the first years after migration (Bloem et al., 2008). For this reason, the variable of the length of residence was dichotomised between those who have lived in the last region more than five years versus those who have lived there less than five years.

The results from the regression models show that there is a strong association between the types of residential trajectories and types of personal networks. Individuals who mainly cited their co-resident partner and children (type "Local family network") lived most of their lives close to their place of birth. They are more likely to have a low level of education and are employed full time.

Table 3. The association between the types of personal networks in terms of composition and spatiality and the types of residential trajectories from the place of birth: The results of logistic regression (beta-coefficients)

	Type 1	Type 2	Type 3	Type 4	Type 5
	Local family network	Local friendship network	Nearby extended network	Nationally extended network	Internationally extended network
Residential trajectories (Ref. Sedentary)					
Proximal	-.69**	.37.	.77**	-1.64*	-.56
Peripheral	.17	-1.13***	.77**	.33	.28
Country-wide	-.37	-1.07**	-.01	2.04***	.18
International migrants	-.74*	-.39	-.68	-.07	1.65***
Length of residence in the last region (Ref. more than 5 years)					
Less than 5 years	-0.52	-0.01	-0.28	1.50**	-0.02
Sex (Ref. Male)					
Female	-.25	-.09	.16	.16	.12
Birth cohort (Ref. 1950-55)					
1970-75	-.14	-.42*	.44*	.30	.18
Level of education (Ref. Low secondary)					
Upper secondary	-.62	-.09	2.88**	-1.80*	.17
Vocational	-.33	-.41	2.78**	-.75	-.03
Tertiary	-.62*	-.51	2.42*	-.29	.44
Activity rate (Ref. Full-time)					
Part-time (51-80%)	-1.20**	-.17	.64	-.49	.64
Part-time (50% or less)	-.27	.08	-.48	.71	.54
Self-employed	.11	-.45.	-.01	.59	.21
Non-active	-.03	-.08	-.01	.20	.08
Citisenship (Ref. Foreigner)					
Swiss	-.46	.40	.92	1.44*	-.75*

Note: N=731, . p<0,1, * p<0,05, ** p<0,01, *** p<0,001.

Individuals who cited very few alters (type "Local friendship network") stay close to their places of birth during their whole lives. Their networks did not widely include members of their family of origin and the nuclear family. These individuals are embedded in networks dominated by spatially close friends (less than 10 km away) and friends within a radius of 40 km. They predominantly belong to the birth cohort born in 1950–1955. Note that the presence of friendship ties and the lack of family ties in their personal networks are not associated with residential migration.

Individuals who mainly cited relatives and friends within a 100-km (type "Nearby extended network") have mainly lived at a periphery of up to 100 km from their place of birth. They more often belong to the birth cohort born in 1970–1975 and have a comparatively high level of

education. Individuals from this group are embedded in larger and diversified networks compared to the previous groups, with the presence of either spatially close partners, relatively close (less than 10 km) parents, children and friends, or spatially distant parents, children, siblings, other kin, and friends within a radius of 100 km. The inclusion of spatially distant members of the family of origin and of friends is completed by the presence of local nuclear family members and friends, thus highlighting an addition effect. However, it does not confirm a selection effect, which would be revealed by a limited presence of relatives, such as parents and children, who live distantly. Siblings, other kin members, and friends who live within a distance of 11–40 km and 41–100 km are also present in their personal networks. The results also do not confirm a substitution effect because spatially close relatives and friends are not largely present in their personal networks in comparison with relatives and friends who live far away.

Individuals who mainly cited spatially close and distant relatives and friends up to 500 km away (type "Nationally extended network") mainly lived far away (between 101 and 500 km from their place of birth). Individuals belonging to this group moved recently (less than 5 years ago) to their current region of residence. The presence of spatially close relationships with non-family members and spatially distant relationships with family relatives and friends confirms an addition effect. This effect is visible quite soon after moving (less than 5 years). A substitution effect is not confirmed because spatially close family members and friends are not overrepresented in their personal networks in comparison to family members and friends who live far away. A selection effect is not confirmed because spatially distant siblings, other kin, and friends are widely present.

Individuals who mainly cited relatives and friends who were either spatially close or lived abroad (type "Internationally extended network") were mainly born outside of Switzerland. They are embedded in internationally dispersed networks, including a spatially distant family of origin and local nuclear family members. They maintain friendship ties both at a distance and locally. The presence of spatially close children and friends, as well as children, parents, sibling, other kin, and friends living abroad, confirms an addition effect. However, a selection effect is not confirmed because siblings, other kin members, and friends living abroad are also present in their personal networks. The results do not confirm a substitution effect because spatially close family members and friends are not largely present in their personal networks in comparison with relatives and friends who live distantly.

Overall, the results show that migrants, including "Peripheral", "Country-wide" and "International migrants" tend to be embedded in large and spatially dispersed personal networks. They maintain long-distance relationships with their family of origin and friends. They also create local ties with children and friends. Individuals who stayed close to their place of birth are predominantly embedded in smaller and more local networks composed of local nuclear family members, parents or local friends. Migrants rebuild their networks mainly through the addition of spatially close relationships, predominantly with children and friends, as well as by maintaining spatially distant relationships with parents, siblings, other relatives, and friends. Selection and substitution effects are less salient for the reconstruction of personal networks in the case of residential migration.

Conclusion

This study examined the influence of residential trajectories on the composition and spatial dispersion of personal networks. It was found that individuals who lived far away from their place of birth are involved in larger, more diversified and more geographically spread out networks in

comparison to weakly mobile or immobile individuals. The latter are embedded in small networks, either with a dominance of spatially close nuclear family members or spatially close friends. Individuals who moved more than 40 km away from their place of birth cited spatially distant parents, siblings, kin, and friends as significant much more often. They also cited spatially close children and friends more often. Thus, residential migration is associated with the addition of spatially close ties and the maintenance of ties with spatially distant alters, particularly with the family of origin and friends.

Controlling for respondents' socio-demographic characteristics, individuals belonging to the birth cohort born in 1970-75 and individuals with a high level of education are more likely to be embedded in large and more geographically extended networks than individuals born in 1950-55 and individuals with a lower level of education. Individuals who moved recently are embedded in large and nationally dispersed configurations. However, the effect of the length of residence on personal networks is not systematically confirmed for individuals who moved at proximity or for international migrants.

The reconstruction of personal networks due to migration was expected to be accounted for by three different mechanisms: addition of spatially close network members, selection of spatially distant network members, and substitution of spatially distant network members by spatially close network members. Among these effects, the addition of new spatially close network members had the strongest impact on the reconstruction of personal networks due to migration. Such addition was reflected by the development of diversified personal networks characterised by the presence of spatially close members of the nuclear family and spatially close friends and distant kin members. A selection effect was not confirmed by the analysis because migrants were embedded in networks with a large presence of spatially distant siblings, other kin, and friends. In addition, the results did not confirm a selection effect towards the nuclear family, known as "family centredness" (Bott, 1971). A substitution effect is not confirmed either because spatially close family and non-family members did not override spatially distant family and non-family members in migrants' networks. The analysis did not support the hypothesis that residential migration leads to the substitution of spatially distant kin and non-kin ties by spatially close kin and non-kin ties. Overall, our results show that the reconstruction of personal networks due to residential migration is hardly gained through the selection or substitution of relationships. We rather observed an increase in the number of relationships, particularly spatially close friends and spatially distant kinship members.

Our results show that distant relatives, particularly members of the family of origin, are largely present in the personal networks of migrants, whereas they are more likely limited in the personal networks of immobile individuals. This finding fully contradicts the expectation that members of the family of origin are widely present in the personal networks of individuals who remain in their place of birth. Geographical distance positively influences the presence of family members, particularly members of the family of origin. Family networks not only survive but also become larger through the involvement of other relatives, in addition to parents and children, living away. Paradoxically, residential migration, which is often associated in the literature with the creation of more personalised relationships, strengthens the presence of family members, particularly from the family of origin, in personal networks. Thus, the creation of new local relationships does not result in the loosening of distant family ties; rather, these processes go in the same direction. The inclusion of spatially distant family members is responsible for family commitments, which continue to play a major role after moving. Obligations to family and friends involve strong normative expectations towards co-presence and care, which is reflected in meetings and activities with friends and family

(Larsen, Axhausen & Urry, 2006; Ryan, 2004; Urry, 2012). Additionally, the salience of the family of origin in personal networks is explained by the effect of distance, which may reinforce the history of family and family roots in the identity of migrants. The migration experiences produce a cumulative effect on personal networks by the addition of spatially close friends and family members to distant ones. Overall, geographical distance favours the creation of more inclusive family networks. This confirms the results from previous studies, which show that new relationships are primarily formed within already established clusters of ties (Lubbers et al., 2010).

Social and migration policies may be well advised to consider such issues. For instance, policies developed in the UK for promoting the integration of immigrants enforce the creation of spatially close relationships (Ryan, 2011). Policy makers should, however, not forget that a large share of the personal networks of migrants is centred on spatially distant family members, which may increase in emotional and practical importance after migration. Migrants provide relatives with support while being supported by them through a variety of exchanges (Baldassar, 2007) and are involved in strong normative expectations towards family and friends (Larsen, Axhausen & Urry, 2006; Urry, 2012). From this perspective, social policies increasing the fluidity of the circulation of spatially distant family members (visas and regimes of residency) may help migrants to sustain their personal networks and social integration in the long run. Conversely, immobile individuals are embedded in small networks, including either the members of their nuclear family or some friends. They may lack personal relationships and be at risk of social isolation, particularly in the event that they need support.

The study has some limitations related to the static link demonstrated between residential trajectories and personal networks. Based on the data at hand and due to the absence of longitudinal data on personal networks, it was not possible to provide a process-oriented empirical demonstration of the link between migration events and changes in personal relationships. Considering personal networks in terms of composition and spatiality across all the phases of residential trajectories would be helpful for understanding network changes associated with mobility issues. The addition, selection, and substitution of alters are strongly intertwined processes, and it is difficult to disentangle them without longitudinal data. In other words, we cannot characterise individuals' personal networks before moving or at which stage of moving these effects appeared. An additional limitation relates to the fact that we could not consider other dimensions of causality related to migration, such as how personal networks impact the likelihood of moving or staying, or the possibility that some relatives follow migrants. This paper provides nevertheless contribution to the literature by delineating such processes and their effects on the composition and spatiality of migrants' personal networks. Further studies should reconsider such processes using longitudinal network data.

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