A Life Course Perspective on Geographical Distance to Siblings, Parents and Grandparents in Sweden

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The kinship network of an individual changes over her life course. This study makes a contribution to kinship research, demography and cultural geography by studying how migration and demographic patterns shape the geographical availability of kin in contemporary Sweden. This study examines how distance to siblings, parents and grandparents change over a person's life course using longitudinal administrative register data. The study follows the complete 1970 cohort (N=74,406) and all their kin and studies how individuals distance to their kin change from age 10 (in 1980) to age 37 (in 2007) by means of data on residence for siblings, parents and grandparents. The study reveals surprising continuity in geographical distance to parents after age 25. Distance to living maternal and paternal grandparents, and siblings, see very minor changes after the index cohort reaches their early 20s. Theories of increasing geographical dispersal of the kinship network as individual ages are not supported.

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1. Introduction

It is well known that individuals in different stages of their life course have very different migration patterns. When looking at a family and kin it is important both to take account that different families are in different stages of their family life cycle, and that this process is embedded in period changes that takes place at the same time (Bengtson and Allen 1993; Mabry et al. 2004). As individual members of extended families move frequently over the life course distance between a person and non-resident kin is a function of the age of an individual. Geographical distance and survival of a kin is a fundamental structural characteristic that shapes

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contact, obligations and provision/acquisition of care. Researchers have speculated that the emotional and care giving role of kin might grow in importance in the near future as life expectancy increases (Wachter 1997; Bengtson 2001). However, an understanding on how availability of kin changes over the life course is currently lacking.

This study will examine how geographical distance to siblings, parents and grandparents changes over the life course when an individual ages. I will follow a Swedish cohort from age 10 until they are 37. Questions on geographical distance to kin are dependent on patterns of internal migration, age of the index generation and their kin, preferences for living close/far from kin and mortality patterns. While researchers have examined these determinants by themselves, geographical data on how geographical proximity changes to kin over the life course remains a black box. The question is relevant for understanding how the economic, social and demographic changes the last century have affected relationships with non-resident family members. This study will fill an important gap in the intersection between demography, kinship research and cultural geography.

2. Background

I will first begin by presenting an overview on previous research on geographical proximity to kin. This will be followed by a discussion of specific factors shaping geographical distance to the specific different kin-dyads examined in the study.

The geography of non-residential families is a topic for research that has seen a growing amount of research. A large number of studies have examined trends and determinants of geographical distance to kin in adulthood. Research on distance to parents in adulthood remains common (e.g. Rossi and Rossi 1990; Mulder and Kalmijn 2006; Hank 2007; Malmberg and Pettersson 2007; Michielin and Mulder 2007; Bordone 2009; Blaauboer et al. 2011; Løken et al. 2013). This research is often presented in a context of parents as potential resources in for example child care. There has also been cross sectional research on distance to siblings in adulthood (White 2001; Kok and Bras 2008). A small amount of research have looked at distance between adults and their grandparents (Lundholm and Malmberg 2009). Most of these studies have shown how these patterns change by age of the kin, but they have typically relied on cross-sectional data from a given period instead of following the same individuals over their life course. It has also

been shown that distance to family members is an important factor shaping migration decisions (e.g. Michielin et al. 2008; Pettersson and Malmberg 2009).

Most internal migration in Sweden takes place within the municipality. Long distance migration is comparatively rare and is usually associated with employment or educational decisions. Swedish migration flows have during most of the 20th century been dominated by movement from rural areas characterized by few employment opportunities, towards the larger metropolitan areas. This pattern is particularly pronounced for women who more often leave their home municipality. Young adults also move to cities with major universities to acquire tertiary education.

The following kinship terminology will be used in the study to refer to different kin. The anchor generation born in 1970 will be referred to as the index cohort and individual members will be referred to as ego. All other kinship terms will be in relation to the kinship network (kindred) of the index individuals. I will use the term family of origin to refer to the nuclear family which includes ego, ego's siblings, and his parents. The nuclear family consisting of grandparents and parents of ego will be referred to as the parental family of origin.

Geographical distance to kin is affected by many important factors as individuals move for different reasons in different parts of their life course (Lee 1966; Rossi 1980). As the main outcome of this study is distance between a geographical dyad, changes in distance for the dyad can be the result from a move from either individual in the dyad. Increasing distance between adult children and there is the results of migration events in both generations.

Distance to siblings and parents are affected by moving out from the family of origin for young adults. Because migration propensities are comparatively high in early adulthood (Glick 1993; Geist and McManus 2008), increasing distance between egos and their parents, will most often be the result of a migration by ego. An important life course event in early adulthood is of course to leave the family home. Sweden is both today and historically characterized by a neo-local pattern of household formation in which adults leave the parental home in the late teens or early twenties (Hajnal 1982; Dribe 2000; Dribe and Stanfors 2005). Three generation households are very rare in Sweden (Sundström 1987). Nest leaving is most commonly not associated with long distance migration in Sweden. Important exceptions are migration to attend tertiary education, as

well as migration streams from more rural municipalities to larger cities. Median age at leaving parental home is a little over age 20 for women and a little before age 22 for men for the 1970 cohort (Statistics Sweden 2008). Another factor associated with distance to biological parents during childhood is the prevalence of union dissolution and stepfamily formation (Andersson 2002).

Geographical distance to grandparents is both shaped by migration decisions of the grandparents, the parents and the index generation. Distance is still mainly shaped by the index generation's mobility, but migration of either the parental family of origin or egos family of origin during egos' childhood could also be important. An additional important aspect when looking at geographical distance to grandparents is survival patterns. When the index generation ages a the pool of grandparents will shrink (Wolf 1994). This will in particular be pronounced for patrilineal and male grandparents, sex differentials in life expectancy and age hypergamy (Kolk 2012).

Geographical distance to siblings, unlike parents and grandparents, are also determined by migration propensities of another similar aged individual, on top of the index generation. Full siblings typically share their parental home until they reach early adulthood. Birth order is an important factor mediating distance to siblings, as geographical proximity to siblings for early born primarily are determined by individual migration decision, while in contrast later born will first experience their siblings leaving the parental home.

Based on previously discussed patterns in internal migration and the age profile of migration, one would expect geographical distance to continue to increase through the life course. This pattern will be much stronger in the early twenties when egos leave parental home, but will continue as ego ages as both ego and his kin will continue to migrate for various labor market reasons. Thus, I propose the following hypothesis.

> *H1: Distance to siblings, parents, and grandparents will increase continuously over the life course.*

3. Research Design

This study will use a longitudinal design following the entire Swedish 1970 cohort from 1980 to 2007 and study how distance to siblings, parents and grandparents change over the life course following the same individuals. Strengths of the study is annually updated life course data, inclusion of all the siblings, parents and grandparents of young adults, and the use of total population register with complete micro-level kinship networks. Longitudinal information on survival status of the index cohort and their kin will also be an integrated part of the analysis.

A key strength of this study is to look at the same individuals over their life course. In this way the actual experience of a real cohort can be shown and one can see how mortality affects distance to kin as older kin gradually pass away. By following the same cohorts over time many selection issues related to mortality that would be a problem in cross sectional survey studies are avoided. The use of complete population data also means that we can avoid issues like non-response rate and sample attrition which greatly could bias this kind of studies. To examine the effect of age and life cycle-stage on geographical distance to kin longitudinal data is needed. Information on survival and geographical information on adult individuals' parents and grandparents is also required. In this study the multigenerational depth is bounded by the limits of the Swedish multigenerational register, limiting cohorts with information on grandparents to the 1970 cohorts. As the data just look at a single cohort, it is important to consider that one cannot isolate period changes during the study from age pattern as the index generation grows older.

The paper will only examine family relations in the sense of genealogical kinship defined by biological parenthood. Family structure is defined from the biological parents and grandparents an individual had at birth. The study will not examine the role of grandparental and parental separation, or the role of half siblings and stepparents. Registry data is excellent for these kinds of analysis, but one should keep in mind the limitations of this structural view of kinship.

4. Data and Methods

This study is based on administrative data on the complete Swedish population. The index population is all men and women born in Sweden 1970 which also has Swedish born parents (N_{women}= 36,282 women and N_{men}= 38,124 men). The latter condition is necessary to ensure that

most individuals can be connected with their kin. These individuals are linked to their full siblings, parents and grandparents by means of the Swedish multigenerational register. Individuals can be linked to their parents starting in the early 1930s, conditioned on that the kin survived until 1960. In practice, virtually the entire cohort can be connected to all their parents and siblings and over 90% to each of their grandparents. All linkage is with biological parents/kin. Geographical information is collected based on 'de jure' residency at the end of every year starting from 1980. Geographical residence is computed using coordinates of population weighted municipality midpoints[2]. A map of municipalities in Sweden is provided in Appendix A. Unfortunately, more detailed geographical information is not available in long comparable time series.

At every year between 1980 and 2007 distance is calculated for all kin dyads in the study. These trends are then presented in time series following the male and female 1970 cohort from age 10 to age 37. Distance to closest younger sibling, closest older sibling, mothers, fathers and all four sets of grandparents is calculated every year. Sibling sets are defined as children sharing two biological parents, only full siblings will be examined. Data analysis on sibling sets is restricted to distance to the closest younger/older sibling in age. Sibling sets with twins are also excluded when computing information on distance to siblings. Before 1990 reliable mortality data on people above age 75 is lacking in available registries, therefore for 1980-1989 information will only be presented on geographical distance to siblings and parents.

5. Results

The results of the study will be presented as a large number of graphs showing distance as to categories of kin as the index generation age. Distance to the mother, father, maternal/paternal grandmother, and younger/older siblings will be presented each showing trends for each dyad. Only results for female egos will be presented in the study, results for male egos were overall qualitatively very similar. Results for distance to biological parents will be shown first after which I will show distance to grandparents. Finally I will show distance to older/younger sibling.

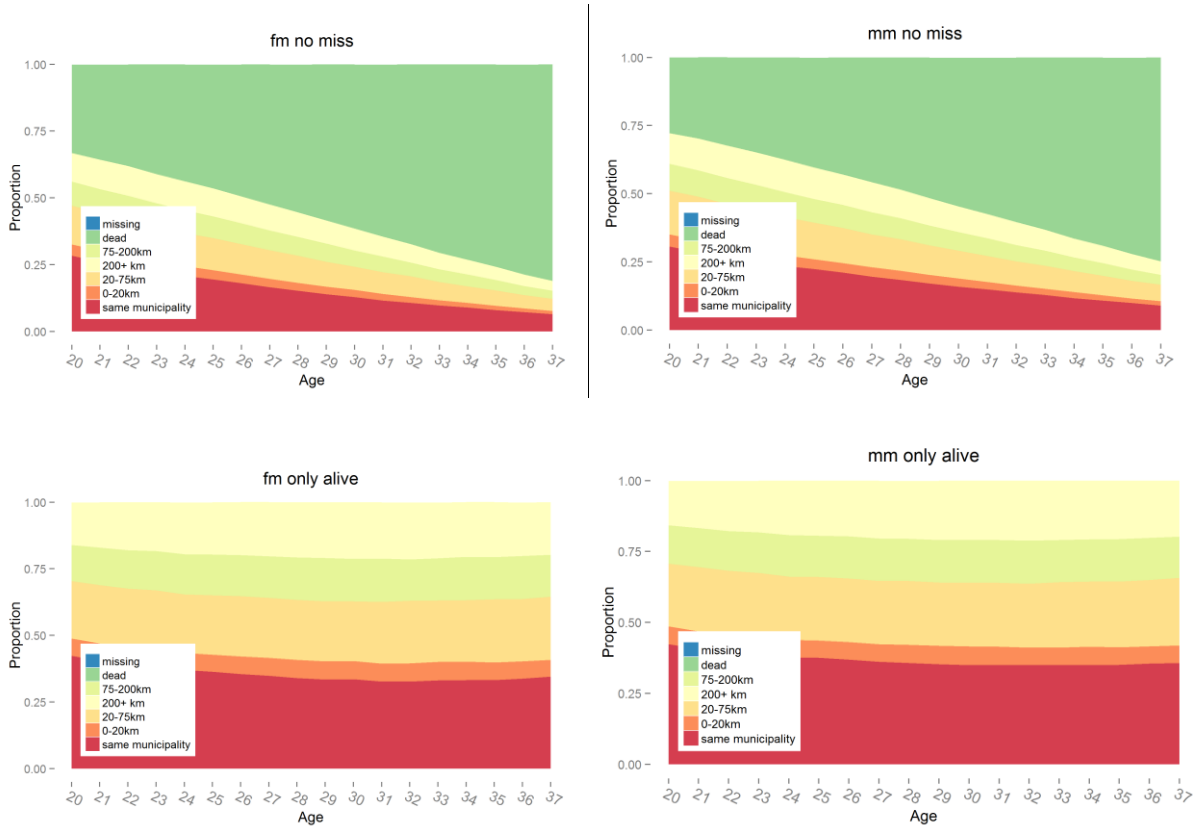
[2] Sweden had 299 municipalities, together having a population of 9,174,464 individuals in 2007. In 2007 the median municipality population was 15,297, and the median area 673 square kilometers (241 square miles).

Figure 1 shows geographical distance to ego's father and the mother. The vast majority of children between age 10 and 18 lives in close proximity to their biological parents. Most of these individuals share household with their parents, but an increasing fraction over time lives with a separated parent or have recently moved out to an own dwelling. Around age 20, when the index cohort leave parental home, it becomes more common that geographical distance to parents are within short commuting distance. This is increasingly followed by an increase in longer geographical distance between ego and parents. Around age 27 the increase in distance between egos and their parents flattens out and is largely stable from then on until age 37. Distances to fathers are marginally larger than distance to mother. This is most likely mainly due to different custody agreements after parental separation. Fathers unsurprisingly have higher mortality than mothers.

Figure 1: Distance to egos mother and father, by age of the index cohort, 1970 cohort in Sweden

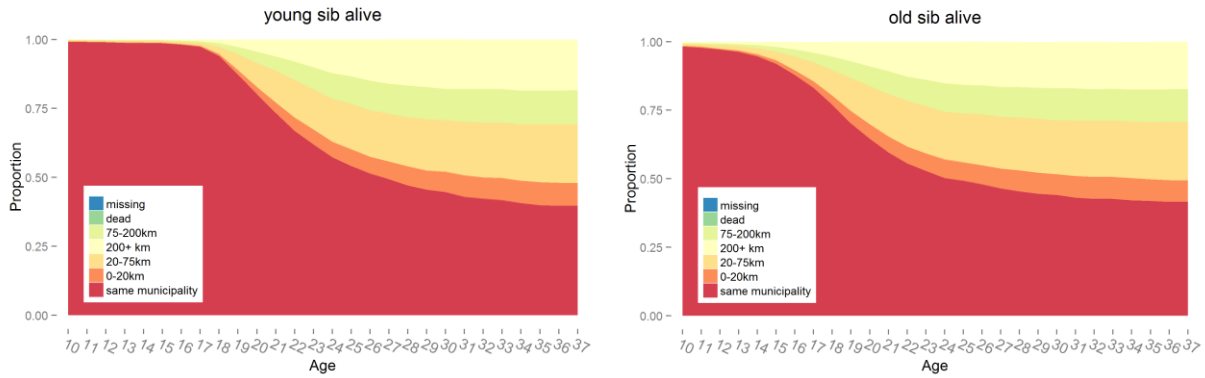
Distance to grandmothers is presented in figure 2. Results for distance grandfathers are largely similar and will not be shown. When examining geographical distance to egos' grandparents, mortality plays an important role. Due to data limitations only time series from 1990 and age 20 are available. At age 20 around 70% have a living maternal or paternal grandmother. At age 37 the probability is only 30% that each of the grandmothers are alive. When only looking at egos that have living grandparents, there is great continuity in geographical distance. There is a small increase in dyads with large distances for egos in their early twenties but from then to the late thirties distance to living grandparents is virtually constant. There are almost no differences between distances to maternal and paternal grandmothers.

Figure 2: Distance to egos maternal and paternal grandmother, by age of the index cohort, 1970 cohort in Sweden



In Figure 3 data on geographical distance to younger and older siblings are presented. The graph only shows data on individuals who have either a younger or older sibling (around 50% in either case). Results are broadly similar as results for distance to parents. Siblings live somewhat further away compared to parents. This is likely because the distance of the dyad is conditional on internal migration of two young adults instead of one adult. People live closer to younger siblings than older siblings, as the latter is older therefore more mobile.

Figure 3: Distance to egos younger and older sibling, closest in age (if such a sibling exist, and is not dead), by age of the index cohort, 1970 cohort in Sweden



Future analysis will most likely rely more on continuous instead of categorical data on distances. The interaction between different kin will also be looked at, examining questions such as having any grandparent alive or within 100 km, and the relative distance between various categories of kin. Looking more carefully at the full kinship network of a kin, will answer important questions about how the complete immediate kin universe changes over time. I will finally consider to use descriptive sequence analysis to produce area graphs consisting of horizontal lines representing single individuals.

6. Discussion

This study makes several contributions to our understanding of social and geographical kinship over the life course. The most striking finding of the early results is the continuity and lack of change over the life course. Once children have moved out of the parental home geographical distance to their parents appears to be quite stable. When looking at geographical distance to grandparents the continuity is similarly salient. Thus, the hypothesis of increasing geographical distance to family members is only supported for younger adults. Mortality steadily reduces the pool of grandparents but the geographical composition of the surviving kin appears relatively constant, however it is possible that conflicting selecting forces are at work. It appears that a view on the life course in which distance to extended kin steadily increases as the kinship network disappears is too simplified. This has implications for how we understand the availability of kin of adults in family formation ages in western countries. The role of kin has

mobility attractors is one plausible explanation for the continuity in geographical distance over the life course (e.g. Michielin et al. 2008; Pettersson and Malmberg 2009).

The results confirm previous results on Swedish family geography in which most people live close to their relatives (Malmberg and Pettersson 2007; Fors and Lennartsson 2008; Lundholm and Malmberg 2009; Pettersson and Malmberg 2009). The findings also highlights the important part which demography plays in kin availability at higher ages (Wolf 1994; Murphy 2011). It is impossible to examine distance to kin over the life course without considering the huge impact of mortality on the probability of having living grandparents. The degree to which this selection on survival affects intergenerational distance deserves consideration in future research. The overall results highlight the need for more research using a longitudinal approach when studying family geography.

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Appendix A: Map of municipalities in Sweden