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Kinship and Socioeconomic Status: Social Gradients in Frequencies of Kin Across the Life Course in Sweden

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Abstract

Socioeconomic status influences demographic behavior. Moreover, socioeconomic status tends to correlate across generations. Consequently, kinship structures likely display social stratification. However, the processes of kinship stratification are intricate, and its prevalence and antecedents are rarely studied empirically. We have estimated socioeconomic differences in kinship in Sweden using administrative register data of the total Swedish population. We created kinship networks for the 1973 birth cohort and followed the growth and decline of kin from birth to age 45 of this birth cohort. We analyzed consanguineous kin, as well as spouses, reproductive partners, parents-in-law, and siblings-in-law. We calculated the difference in total kinship size across earnings and educational groups. We broke down the contributions of specific kin groups to this difference and also analyzed which demographic behaviors and generations contributed most to socioeconomic differences in kinship. Among men and women with low socioeconomic status (SES), higher fertility in earlier generations resulted in more kin than those with high SES. Among low SES men and siblings, lower fertility and union instability narrowed SES differences in the number of kin.

Keywords: kinship, socioeconomic status, generations, Sweden, family

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Introduction

The last decades have witnessed a growing interest in kinship across the social sciences. In demography, this is reflected in research estimating the demographic traits of kin, including incidence of kinless-ness, as well as total kinship size (Daw et al. 2016; Malmberg & Pettersson 2007; Verdery & Margolis 2019). A diverse literature has documented how extended family affects life chances and provides emotional support and care for dependent children or aging relatives (Bengtson, 2001; Furstenberg, 2020; Rossi & Rossi, 1990)). Compared to other sectors of society, kin members are most likely to give financial aid and can provide informal access to labor markets and advice on educational choices (e.g. Milardo, 2009). Social stratification research has explored the possibility of social advantages being nested within kinship structures and found that one's own socioeconomic outcomes are associated with characteristics of proximate as well as more remote kin (Lundberg, 2020; Mare, 2011). However, growing awareness of the role of kin as a resource, as well as a cause and consequence of social stratification, has not been complemented by a demographic analysis of the frequencies of kin across social groups.

Research has identified substantial socioeconomic gradients in the demographic processes that determine kinship, such as social gradients in mortality (Bosworth, 2018), age at childbirth and number of children ever born (Jalovaara et al., 2019; Kolk, 2022), in marriage, cohabitation and union dissolution (Härkönen & Dronkers, 2006; Kalmijn, 2013), partnership choice (Blossfeld, 2009), and complex kin relations following multi-partner fertility (Jalovaara, Andersson, & Miettinen, 2022). Yet, we know little about socioeconomic gradients in the size, dispersion, and composition of kin relations (though see Daw, Verdery, & Margolis, 2016; Goldstein & Warren, 2000). This research gap is not only surprising, but also unfortunate and problematic for at least two reasons. First, social scientists that analyze the 'effects' of kin (what kin members do) assume a homogenous distribution of kin across socioeconomic status

(SES) (Bengtson 2001). However, at present we lack knowledge of SES differences in kinship. To calculate the impact of how kin can provide help, we need not only information on an individual's propensity to help but also data on the denominator (i.e., the number of kin). Second, while the field of kinship demography has produced a theoretical comprehension of kinship generation, the models developed are rarely pinned against empirical data, especially concerning SES-related differences in kinship structure. Importantly, simulations and mathematical models of stratified kinship structures are likely to fail due to the complexity involved in modelling demographic rates, social mobility, and the intergenerational transmission of SES and demographic behavior across historical time periods and generations (Ruggles 1993). The research agenda remains in an exploratory phase. This motivates research examining SES gradients in kinship using comprehensive observational data on kinship networks. Swedish demographic is broadly comparable to other industrialized western countries. At the same time, Statistic Sweden's registers are the best available source to accurately capture the frequencies of multiple generations of kin across the life course, because parent-child linkages are available further back in time than other administrative records. We used administrative registers to analyze kinship across four generations for a full birth cohort born in 1973 in Sweden, and examined differences in the composition and size of kinship networks across income groups. We documented the average number of living kin (in total and by kin type) at each age from birth to age 45. We quantified the magnitude of the SES gradients in kinship and what type of kin was propelling this difference at each age. Our research aims to answer which demographic forces—fertility, mortality, or family dynamics—are most critical for SES gradients in kinship, and which generation is most influential. We examine at what age SES gradients most strongly manifest. We also explore differences between men and women in both demographic behavior and social mobility, and examine SES gradients in kinship based on gender.

To study these questions, our research design diverges from most previous analyses. First, in theorical work on kinship, a fundamental difference has been established between biological kin (hereafter consanguine kin) and kin accrued through marriage (partners and in-laws, hereafter affine kin). Affine kin transfer wealth and resources across unrelated families and create horizontal social bonds of a cohesive character (Lévi-Strauss, 1969[1949]). Yet, kinship demography has largely focused on consanguineous ties only. We have investigated both consanguineous and affinal kinship. Second, as predicted by many models on childbearing behavior and parenthood, the socioeconomic gradients of fertility and marriage are based on gender. For example, completed fertility often has a more positive gradient for men, while this is less true for women (Kolk, 2022; Lappegård, 2020), and rates of intergenerational mobility may differ between men and women (Thaning & Hällsten, 2020). This likely has implications for SES gradients in kinship. In our study, we examined parent-child ties and fertility among both sexes, and we were able to contrast the kinship networks of the male and female portions of the index cohort. Third, the SES gradients of a given birth cohort comprise the combined outcome of an individual's fertility, mortality, and union formation, as well as the number of children, age at childbirth, and spacing of other kin members such as parents and aunts/uncles. These factors impacted kinship structure at different chronological ages of the index cohort. Hence, cross-sectional counts are inadequate (e.g. Kolk, Andersson, Pettersson, & Drefahl, 2021; Malmberg & Pettersson, 2007).

We used a cohort longitudinal perspective to measure the in- and outflow of kin across the life course from birth to 45. We examined how the demographic behavior of each generation relates to the observed kinship structure of the index population. Finally, our data differ from that of most previous approaches for calculating kinship, such as survey data estimates, micro-simulations, and analytical methods. In fact, large-scale empirical demographic studies of extended kin are rare (see Kolk et al., 2021 for a review). Here, register data have critical advantages as such data contain information on nearly all individuals that make up the kinship network. In contrast to simulations and mathematical models, we did not require assumptions about population homogeneity in kinship-generating behavior. This also allowed us to analyze kin dispersion, rather than the arithmetic average only.

Our findings shed light on the processes involved in generating a socially stratified kinship structure amassed by the distinct demographic behavior of four generations. The results show that the average total kinship size for women born 1973 is up to half a standard deviation larger for female low-income earners than high-income earners. For men, low-income earners have substantially more kin at early ages, while high-income earners have more kin at later ages. We show that cousins, aunts, uncles, and in-laws are the kin types that drive this pattern.

Causes of Socioeconomic Differences in Kinship

The number of kin an individual has is determined by demographic processes, not only with respect to the individual, but also in terms of behavior in preceding and subsequent generations. Likewise, the difference between the kinship networks of individuals from a given SES is dependent on the intergenerational transmission of SES and the socioeconomic gradients of demographic behavior. Each generation's demographic behavior is imbedded in its historical context (Buhr & Huinink, 2014). Different contexts may have SES gradients in opposing directions, of different magnitudes. Below, we review research on the social gradients in demographic processes that determine kinship, and more briefly how kinship structure may influence SES, as well as how SES and demographic behavior are correlated across generations. We then present how we measure and define kinship.

The level of mortality in a population affects how likely subsequent generations are to be alive at the same time and the extent of generational overlap. There is a negative correlation between mortality and SES across high-income countries in the 20th and 21st centuries (Bosworth, 2018). Some evidence indicates that such differences are growing larger over time (Bengtsson, Dribe, & Helgertz, 2020; Bosworth, 2018).

The most important determinant of the size of a kinship network is the average number of children of older kinship members. If parents, grandparents, children, and siblings have more children, the kinship network will expand, and more generations will be alive at the same time, thus making the network more horizontally extended (Bengtson, 2001). A classical topic in demography going back to the founders of statistics, such as Galton (Galton, 1869), is socioeconomic differences in childbearing (Skirbekk, 2008). Broadly speaking, pre-industrial populations had positive gradients between status and completed fertility, while after the demographic transition, negative correlations were more often found, in particular for women (Lee, 1987; Skirbekk, 2008). In 20th- and 21st-century Sweden, this pattern has been strongly gendered, with positive or neutral associations for men, whereas for women, negative gradients have become neutral or positive (Edin & Hutchinson, 1935; Jalovaara et al., 2019; Kolk, 2022). For cohorts born in the 1970s and later, there are positive gradients between income and fertility for both genders, while for education, the pattern is neutral for women and positive for men (Jalovaara et al., 2019; Kolk, 2022). From the perspective of the 1973 cohort, fertility generated a negative SES gradient in kin number driven by older generations' fertility, which produced more uncles (and thus cousins) for low SES populations versus high SES populations. Later in life, however, the low fertility of low SES populations and their intra-generational peers (siblings) diminishes kinship growth by producing fewer younger generations (children, nieces, and nephews).

Not only the number of children, but also the age of childbirth matters for kinship structures. Earlier childbirth across generations produces kinship networks with more individuals alive at the same time, while later childbearing decreases generational overlap (Kolk et al., 2021;

Murphy, 2011). Later childbirth thus means that fewer people from the older generation will be alive as individuals age. Age at first birth usually increase with higher SES and education. As a determinant of generational overlap (e.g., the average shared lifespan of a grandchild and grandparent), SES differences in early childbearing (and hence less time between generations) are more important for differences in mortality; as a result, the probability of one's grandparents being alive is higher among low SES groups in Sweden (Kolk, 2017).

Both the timing of one's first birth and the spacing across later parity progressions influence intergenerational overlap. Longer intervals across children in initial generations cascade across the kinship network, causing temporally more dispersed kinship networks for kin such as cousins (Kolk & Hällsten, 2017). In Sweden, low SES groups have more dispersed birth spacing than high SES groups (Andersson, 2020). Hence, siblings will be born less close to an individual in low SES groups. Moreover, if men and women have children with one or more partners, this will affect kinship relations. Low SES groups have a higher incidence of birth among multiple partners (Andersson, 2021; Jalovaara et al., 2022). As a consequence, a larger share of low SES individuals' kinship networks will consist of half siblings rather than full siblings.

Research on social stratification has documented that socioeconomic differences are inherited intergenerationally. On average, we can be certain that children and parents, and to a lesser extent cousins, grandchildren, and aunts/uncles (Hällsten & Kolk, 2022), will share socioeconomic traits. However, this process is also shaped by social mobility, which is comparatively high in Sweden (Breen, 2004). As a consequence there will still be considerable heterogeneity within kinship networks in terms of socioeconomic outcomes (cf. Goldstein & Warren, 2000). As such, high social mobility will decrease socioeconomic differences in kinship, and societies with lower inequality will likely have less pronounced socioeconomic differences in demographic behavior. Moreover, demographic behavior itself, above and beyond social mobility, is correlated across generations and among kin members of the same generation. There is evidence of the intergenerational transmission of fertility (Kolk, 2014a; Murphy, 1999), divorce (Amato, 1996), and mortality (Gavrilov & Gavrilova, 2001). Correlations in fertility will create some very large and some rather small kinship networks, which may be an important explanation for the large divergence one finds in the number of kin in a population (Kolk et al., 2021). One key insight from research on the intergenerational transmission of fertility is that kin group correlations are not primarily the function of socioeconomic differences (Kolk, 2014b).

While the intergenerational transmission of advantages will affect the SES distribution in a kinship network, family and kinship structure will also impact SES in many circumstances. For example, parental age and the number of siblings one has may both influence a child's SES, but will also shape the structure of the kinship network. Such effects may be causal or associational, but will in either case be associated with socioeconomic differences in kinship.

A final source of complexity is that a four-generation kinship network consists of individuals born over a very wide timespan (up to a century apart), where generations often overlap in birth years (Kolk & Hällsten, 2017). During this period, the sociocultural and demographic contexts change tremendously. While it is likely that one's relative position in a socioeconomic hierarchy of different family members still shows resemblance, the socioeconomic gradient in fertility may differ substantially. For example, in the 1960s and 1970s, union instability was more common in high SES groups, but now the opposite is true (Härkönen & Dronkers, 2006); this has had outcomes for multi-partner fertility (Jalovaara et al., 2022; Thomson, Winkler-Dworak, Spielauer, & Prskawetz, 2012). Women with high incomes and education used to have fewer children, which is no longer true in contemporary Sweden (Jalovaara et al., 2019; Kolk, 2022).

Why Expect Socioeconomic Differences in Kinship?

In consideration of the above factors, there are many reasons to expect socioeconomic differences in kinship composition and size. However, many of these factors imply that multiple demographic and generational processes influence SES gradients in kinship in opposing directions. Socioeconomic correlates of demographic behaviors work in one direction during a given historical period and in the opposite direction at other times. The structure of a kinship network will vary greatly over the life course in different ways across SES groups; thus, cross sections at a specific age may give an incomplete or distorted picture (Lundholm & Malmberg, 2009). Moreover, the SES gradients in kinship networks will depend on social mobility in each generation, the correlation between SES and demographic behavior in each generation, and the intergenerational transmission of demographic behavior (Breen, Ermisch, & Helske, 2019). Kinship is a complex system that is challenging to predict analytically, even with a large number of varying SES input rates. Hence, to advance understanding of socioeconomic differences in kinship, a more descriptive and exploratory approach is helpful. Here, a reasonable starting point is to demonstrate empirically how an individual's kinship structure varies by SES over the life course. Our approach involved determining the number of kin alive during the life course from the perspective of an index cohort (cf. Daw et al. 2016). As consanguineous kin were born and died, and affinal kin were added and removed via union formation and dissolution over the life course, we mapped the change in the stock of total kin. This provides us with a bird's-eye view from which to analyze what demographic processes (e.g., fertility, mortality, age at first birth) of which generations (e.g., grandparents, the index cohort) produced socioeconomic differences in kin. In addition, we show demographic behavior by type of kin for the relatives that are most critical to determining the size of the kinship network (grandparents, parents, uncles, siblings, and the index person him/herself). We examine differences across SES in year or birth, age at first birth, fertility, nuptiality, and mortality to better understand why we later observed differences in the total number of kin (the product of demographic behavior across many generations).

For our study, we explore a wide variety of kin relationships. We include not only parents, grandparents, and siblings but also aunts, uncles, cousins, nieces, nephews, half siblings, partners, and in-laws. We do not purport to present an all-encompassing picture of perceived kin, which would include step relations, guardians, close friendships, and other bonds that are not definable through birth or marriage registers (Rossi & Rossi, 1990). More fundamentally, we only documented the existence of kin as observed through consanguineous and affinal links, and we did not in any way map subjective experiences of kinship that would only partially overlap with the categories we mapped in our data. In particular, for more distant kin relationships such as cousins and nieces/nephews, there are likely many cases where there are only limited social interactions with the index person and their kin. In some cases, the potential benefits of kin (such as direct investments of time and money) require interactions with living kin, while other benefits may be obtained indirectly through tacit knowledge and practices (role models' effects, social networks, and cultural capital). In all cases, meaningful interactions with more distant kin are dependent on good social relationships that hinge on structural factors, such as geographic distance, as well as on subjective judgments regarding whether an individual is "kin" or not. Our goals are more limited; we aimed to demographically quantify the number of kin as defined through observable birth and marriage records, regardless of the extent to which these are socially relevant relationships.

Previous Research

After considering the determinants of kinship-related SES gradients and the definition of kin, we now discuss previous research that in different ways has engaged with our primary aim –

documenting social gradients in human kinship. Understanding how population-level demographic rates produce kin relations at the population level has been the focus of much research in the emerging field of kinship demography (Caswell, 2020; Daw et al., 2016; Kolk et al., 2021; Murphy, 2010; Verdery, Margolis, Zhou, Chai, & Rittirong, 2019). A recent review has identified research on social differences in kinship as particularly unexplored (Alburez-Gutierrez et al., 2022). However, nearly all of previous empirical research has centered on average kinship in a population without distinguishing different social groups. Few studies have explored if and how kinship differs by SES.

Most literature on SES and kinship has analyzed whether individuals receive benefits from kin members in outcomes such as social support and financial transfers. Others have investigated how characteristics of kin, such as the education level of grandparents and uncles, relate to or affect an individual's own educational attainment or wealth. However, such direct influence of kin is contingent on the actual existence of specific kin at a given point in time. We know fairly little about the demography of human kinship, and even less about socioeconomic differences in kinship. Micro-level data on kinship networks are very data-demanding, which means that demographers mostly used indirect methods to estimate quantitative information on human kinship. Co-resident kinship has been well covered in studies using census data (Ruggles & Brower, 2003; Ruggles & Heggeness, 2008). Census data often include socioeconomic information, so basic correlates on sociodemographic covariates with household arrangements have been calculated in different contexts (Pilkauskas, Amorim, & Dunifon, 2020; Ruggles & Heggeness, 2008).

For research on kinship outside the household, the primary topic of this study, different methodologies have been employed. Analytical models have used demographic rates to estimate kinship frequencies (Goodman, Keyfitz, & Pullum, 1974; Uhlenberg, 1996). Such models produce kinship estimates based on the assumption that an entire kinship network shares the same demographic behavior. This could in theory be harnessed to assess kinship differences between sociodemographic groups, but this is mostly plausible if groups are highly endogamous (e.g., black and white Americans). An example of using an analytical model with socioeconomic information can be found in the work of Song and Mare (2019), who calculated ages and the extent to which grandparents and grandchildren overlap. Micro-simulations also involve rates to estimate kinship, where individual-level rates are employed to produce micro-level simulated kinship networks (Murphy, 2004, 2010; Wachter, 1997; Zagheni, 2015). From such networks, demographers can then establish how kinship has changed over time, and projected rates can be used to extend forecasts into the future.

Neither analytical models nor micro-simulations account for the fact that demographic behavior (and socioeconomic status) is correlated within families (Ruggles, 1993). Both simulations and analytical models are difficult to use for estimating socioeconomic differences in kinship, though it would in theory be possible with more complex agent-based models. Instead, what we know of SES differences in kinship primarily comes from empirical data. If groups are assumed to be strictly endogamous, which is partially plausible for US racial groups, but for few other social groups, group differences can still be calculated (Verdery & Margolis, 2017). For near kin, such as grandparents and grandchildren, we have considerable knowledge of both demographic patterns and SES patterns (Chapman, Lahdenperä, Pettay, & Lummaa, 2017; Leopold & Skopek, 2015; Margolis & Verdery, 2019; Skopek & Leopold, 2017), while for more remote kin we know less.

Some surveys collect ego-centered kinship information to varying degrees. Surveys that have been used for this purpose include the Netherlands Kinship Panel Study (NKPS), Ouders en Kinderen in Nederland survey, and to a lesser extent, the international Gender and Generation Survey (GGS), the Survey of Health, Ageing and Retirement in Europe (SHARE) investigations of the elderly, and complex surveys such as the Panel Analysis of Intimate

Relationships and Family Dynamics (PAIRFAM) in Germany and the Panel Study of Income Dynamics (PSID) in the United States. The NKPS was used in one of the most ambitious mappings of kinship networks (Dykstra & Komter, 2006), but not according to socioeconomic status. An ambitious attempt to determine socioeconomic and racial differences was carried out by Daw et al. (2016). They used PSID data together with imputation methods to establish differences by SES in different kin counts. Goldstein and Warren (2000) examined how common this was with kinship networks that bridged different socioeconomic groups as a counterweight to how social stratification creates social closure. De Bruycker (2008) utilized the NKPS to explore whether SES differences in kinship structure served as a mediator for observed frequencies in contact with kin. Older studies used more labor intense ethnographic methods where they collected quantitative egocentric kinship data through self-reports and examined variation across race and SES (David M. Schneider & Cottrell, 1975; David Murray Schneider & Smith, 1973; Young & Willmott, 1957), though they mostly focused on kin as reported by respondents, rather than the more strict genealogical approach taken here.

Finally, register-based studies have examined different aspects of kinship demographics using a cross-sectional approach, some of which have covered SES differences in narrow aspects of kinship. Lundholm and Malmberg (2009) analyzed the prevalence of having four generations of overlapping kinship at age 55, with some focus on SES differences among 55-year-olds. Kolk et al. (2021) described Swedish biological kinship across cohorts in 2018, but did not study variation by SES. Kolk (2017) investigated SES differences in geographic distance and survival of different kin from childhood to age 37. Ongoing research in the Netherlands using register data (van der Laan, de Jonge, Das, Te Riele, & Emery, 2022), are an emerging source of data for kinship demography. Linked censuses also show great promise for future kinship research(Bailey et al., 2022).

In sum, despite an impressive range of studies on kinship, few have taken a holistic approach to counting the total number of kin, and a knowledge gap endures regarding the socioeconomic disparities in kinship networks across the life course. Closing this research gap would represent a clear contribution to kinship demography and simultaneously inform the literature on the role of kinship members in social stratification. Hence, we aimed to complement and expand on previous research by using an empirical, cohort-focused, longitudinal approach based on total population data.

Data and method

Data

We used national population administrative registers covering Sweden's entire population. The registers cover monthly data on births and deaths and are linked through unique personal identification numbers. We examined the general kinship network from the perspective of all men and women born in 1973 in Sweden, using digitized data in the registers from 1932 to 2018, with the oldest kin being born in the late 19th century, where observation in our registers is conditioned on survival to 1960.

For this cohort, we constructed the individual's (i.e., the index person's) consanguineous kinship structures by using birth records linked across children and their biological parents, which can be repeated across multiple generations to create full kinship networks. Parent-child links are first traced upward to identify a first (and oldest) generation: Via the index person's mother and father, we identified the index person's maternal and paternal grandparents. After locating this grandparental generation, parent-child links are traced downward: Through the index person's grandparent, we identified the index person's maternal and paternal aunts and uncles, and from aunts and uncles we derived cousins. The same method is used to trace younger kin such as children and nieces/nephews. Having counted the total number of kin in our index cohort, we took the yearly date of births and deaths of every kin member and summed up the number of kin alive in each subsequent year to compute kin frequencies by age. We counted the number of kin from age 0 to 45, which corresponded to the years 1973–2018.

In addition to biological kin, we constructed kinship networks based on partnership information. We considered three groups of in-laws or affinal kin, where the first was the index person's partner. The definition of a partner is two-pronged to account for cultural and legal norms in Sweden. First, a marital spouse, identified through yearly civil records, is considered a partner as long as the marriage lasts. Moreover, we included non-married but currently cohabitating men and women with which the person has at least one shared child. We used this definition of a partner for our variable of frequencies of having a partner, and also for linking our index persons to affinal kin. The second group of in-laws comprised those connected through this partner: the partner's parents (mother-/father-in-law) and siblings (brothers-/sisters-in-law). The third class of in-laws, connected through the index person's siblings, consisted of the partners of those siblings (which we refer to as sibling's partner, to avoid confusion with partner's siblings, that we refer to as brother/sister-in-law). In contrast to the previous two affinal groups, this third affinal group is linked to the index person through their siblings (not through the partner).

Our definition of affinal kinship, from the perspective of the index cohort, is qualitatively different from that of consanguineous kin in that we only counted affinal kin and partners as long as the index person was still in that partnership, in addition to being alive. Union dissolution—i.e., divorce (or residential separation from a partner with a shared child)—dissolves the partner link according to our definition. For example, an index person has zero parents-in-law if the person has separated from their partner. The index person may regain (a different set of) parents-in-law at a later age if they form a new partnership. In sum, our study includes parents, children, siblings, half-siblings, grandparents, grandchildren, cousins, aunts/uncles, and nieces/nephews (the consanguineous kinship network), as well as partners, parents-in-law, siblings-in-law, and siblings' partners (the affinal kinship network).

In addition to enumerating the age-specific stock of alive kin as described above, we will begin our results section by comparing vital statistics from both the 1973 index cohort, and the (average, in the case of more than one kin in the group) vital statistics for the other kin groups included above. Dimensions of vital statistics that we compared included their cohort, age at first birth, average number of children, the proportion of childless people, the proportion ever-married, and proportion ever-separated). We also made these comparisons based on income and education.

Study Population

We defined our population as the index person having been born in Sweden in 1973 to Swedish-born parents. We chose the 1973 cohort and the Swedish-born sample restriction because this maximized both kinship coverage and representativity given data available in the registers. For this cohort, we examined nearly all childbirths, and we linked them to most of their grandparents (this was also necessary to link the index persons to their aunts/uncles and cousins). Our population was further conditioned on having at least one maternal and one paternal grandmother that could be identified. Both grandfathers' and grandmothers' parent-child links could be used to identify downstream kin. However, we were more likely to identify grandmothers, as they were born later, and we avoided issues of missing data on paternity. We covered about 91% of grandparental links in the 1973 cohort compared to, for example, 75% of the 1968 birth cohort. Parent-child linkage information in Swedish registers starts from 1932 (and is partial for the following 2–3 years). This means that grandparents of parents born before 1932 cannot be observed and cannot be used to form links to uncles, aunts, and cousins. Using the 1973 index cohort, we linked individuals to their parents if the parents were 41 years or younger. This meant we could capture nearly all mothers and most fathers (different ages are evaluated in Kolk et al., 2021). Our data were also conditioned on survival to 1960, for which the census is included in Statistics Sweden digitized registers. This survival condition was critical for grandparents and was necessary for connecting index individuals to kin such as aunts/uncles and cousins. Grandparents who had children after 1932 must therefore survive to 1960 (approximately to around age 60 for an individual who had children in the early 1930s).

Choosing a later index cohort would increase the share of the birth cohorts with full kinship links to older generations. However, this would decrease the age of the last observation and hence produce a loss of information about children, nieces/nephews, and in-laws not yet added/alive by that age. Observing the extended development of kinship across the life course is especially important when analyzing differences in social stratification in kinship, as entry to parenthood occurs later among high SES groups.

Finally, as with most other observational studies, we could not measure kin that were not registered as living in Sweden; we could only observe kin linked through marriage and biological childbearing (excluding adoptive parents and cohabiting partners without shared children), and we could only partially capture the experiences of same-sex couples. Same-sex marriages are uncommon in this cohort, but we included spouses (and affinal kin) in our analysis for marriages formed after the legalization of same-sex marriage in Sweden in 2005.

We operationalized socioeconomic status by annual income earnings from taxation registers. We measured earnings at age 39, 40, and 41 of the 1973 birth cohort. For this population, and for men and women, we created separate income rank percentiles at age 39, 40, and 41. We then used the highest income rank position achieved during those three years. Finally, this income rank position was binned into quartiles of four income rank groups. We also reiterated our analysis across groups based on individuals' highest education level at age 45 drawn from

Swedish educational registers. The categories correspond to ISCED levels 0–2, 3, 4–5, and 6–8: basic education and short/interrupted upper-secondary secondary education; upper-secondary education; non-tertiary upper-secondary education or short cycle tertiary education; bachelor's degree, a master's degree, or the equivalent (UNESCO, 2012).

Results

First, we describe the demographic behavior in our index cohort and their kin separately across the SES of the index generation. Second, we describe the observed average number of alive specific kin members across the index cohort over the life course by SES. Thereafter, we show how different types of kin added to the total kinship size of the kinship network, as well as the dispersion of total kinship size. Lastly, we break down the difference between the highest and lowest income quartile groups of the 1973 population regarding the total number of kin, and we demonstrate the proportional importance of each kin type to this overall SES difference. In the supplementary material, we complement this analysis with exercises where we outline the full distribution of kinship size by age, contrast the other income quartile groups, vary the inclusion criterion of kin members, and use education level instead of income as the stratifying variable.

Demographic Behavior of Kin

Table 1 depicts the differences in demographic measures for both the index person and for their kin members based on the person's SES. For categories of kin with multiple members (e.g., cousins) the numbers refer to the average value. We find that age at first birth is increasing, and fertility decreasing across generations—from the grandparental to the index generation. Note, however, that our members of our index generation are not conditioned on childbirth, while grandparents and parents are and thus have on average more children. The grandparental and parental generations of the low-income index population display higher fertility and lower age at first birth than those from higher income groups. Aunts/uncles of lower SES generations had children earlier in life and also had more children, though the effects were rather moderate. For the index cohort and their siblings, we found only small SES differences in fertility. However, lower SES groups were married less often, and more frequently childless and divorced. Appendix Tables A1 and A2 indicate that these patterns were similar for men and women, with the exception that in terms of fertility, members of the index cohort and their siblings showed a negative SES gradient for women, but a positive gradient for men.

In sum, from basic demographic rates in Table 1, we can deduce that sociodemographic differences across the kinship network are likely to be moderate. Moreover, we expected that existing SES gradients in kinship structure would originate mostly from higher and earlier childbirth among parents and grandparents with low SES, which created more horizontally extended kinship networks, with higher marital and union stability among those with high SES. In order to analyze these assertions, we examine then the occurrence of alive kin across the life course from the index person's perspective.

Table 1. Vital statistics of the 1973 Swedish-born birth cohort and their kin, by earnings income rank measured at age 40.

	Income quartile	N	Birthyear [1]	AFB [2]	Children [3]	Parity 0 [4]	Marriage [5]	Divorce [6]	Dead at 60 [7]
Index cohort	All	75,267	1973	29.8	1.75	0.17	0.56	0.08	n.a.
	1st	18,953	1973	29.4	1.72	0.22	0.48	0.10	n.a.
	2nd	18,779	1973	29.2	1.77	0.17	0.52	0.08	n.a.
	3rd	18,882	1973	29.7	1.74	0.17	0.57	0.08	n.a.
	4th	18,653	1973	31.1	1.78	0.15	0.65	0.07	n.a.
Mothers	All	75,267	1947	23.3	2.53	0	0.92	0.18	0.04
	1st	18,953	1947	22.8	2.61	0	0.90	0.21	0.05
	2nd	18,779	1947	22.9	2.56	0	0.91	0.18	0.05
	3rd	18,882	1947	23.4	2.51	0	0.92	0.17	0.04
	4th	18,653	1946	24.3	2.43	0	0.94	0.16	0.03
Fathers	All	75,267	1945	25.7	2.50	0	0.91	0.15	0.06
	1st	18,953	1945	25.3	2.57	0	0.88	0.18	0.07
	2nd	18,779	1945	25.4	2.53	0	0.90	0.15	0.07
	3rd	18,882	1945	25.7	2.48	0	0.91	0.15	0.06
	4th	18,653	1944	26.3	2.42	0	0.93	0.14	0.05
Grandmothers	All	150,534	1917	22.0	3.09	0	n.a.	n.a.	0.04
	1st	37,906	1918	21.8	3.19	0	n.a.	n.a.	0.04
	2nd	37,558	1918	21.9	3.14	0	n.a.	n.a.	0.04
	3rd	37,764	1917	22.0	3.06	0	n.a.	n.a.	0.04
	4th	37,306	1917	22.3	2.93	0	n.a.	n.a.	0.03
Grandfathers	All	150,534	1914	24.1	2.98	0	n.a.	n.a.	0.05
	1st	37,906	1914	24.1	3.06	0	n.a.	n.a.	0.05
	2nd	37,558	1914	24.1	3.02	0	n.a.	n.a.	0.05
	3rd	37,764	1914	24.0	2.95	0	n.a.	n.a.	0.05
	4th	37,306	1914	24.2	2.86	0	n.a.	n.a.	0.04
Aunt/uncles	All	307,103	1947	25.4	1.97	0.15	0.78	0.15	0.06
	1st	81,664	1947	25.1	1.99	0.16	0.76	0.15	0.06
	2nd	78,720	1947	25.2	1.99	0.15	0.77	0.15	0.06
	3rd	76,895	1947	25.4	1.97	0.15	0.78	0.14	0.06
	4th	69,824	1947	25.9	1.94	0.16	0.80	0.14	0.05
Siblings	All	99,869	1973	29.2	1.75	0.20	0.55	0.09	n.a.
	1st	25,371	1973	28.6	1.75	0.21	0.52	0.10	n.a.
	2nd	25,387	1973	28.7	1.76	0.20	0.53	0.09	n.a.
	3rd	25,054	1973	29.2	1.75	0.20	0.55	0.09	n.a.
	4th	24,057	1974	30.3	1.73	0.20	0.59	0.08	n.a.

[1]Mean year of birth. [2]Mean age of first birth. [3]Mean number of children born by age 40. [4]Percentage with no children born by age 40. [5]Percentage ever married by age 40. [6]Percentage ever divorced by age 40. [7]Percent dead by age 60 (only cohorts where the majority were potential aged 60 in 2018). Note that we only observe kin conditional on survival to 1960. We do not have civil status registers for the grandparent generation. If individuals have not yet reached age 40/60 they are not part of the calculation for that variable. n.a. means not available. N refers to total number of kin in category.

Average Number of Alive Kin

In the following, we first show the average number of kin an individual of different types. We first show kin that are biologically related to the index person (consanguineous kin), after which we show the in-laws, i.e., the kin of the index person's partner (if they have one), and siblings' partners. We first discuss men, and then women, as men often have the larger gradients. Figure 1 shows the mean number of consanguineous kin for all different types of kin across the life course, separately for each income group. For most kin groups, the differences across income are rather small. Four features stand out: First, low-income men have more horizontal kin, such as cousins and aunts/uncles, due to higher fertility in previous generations in low-income men's kinship network(s). Low-income men also have more half-siblings. The differences are substantial in size and monotonically decrease with higher incomes. Finally, there is a weak positive gradient in kin for a few other types of kin, where high-income men have more children and are slightly more likely to have a parent alive. Figure 2 portrays the mean number of affinal kin for men. The number of affinal kin expands rapidly once individuals begin finding a to partner in their early 20s with some earlier affinal kin through their siblings' partners. We found large differences by SES in the probability of having a partner. As a consequence, patterns tied to partnerships and union stability—and in relation to having affinal kin—exhibit strong income differences. Low-income men have a partner earlier, but are far less likely to have a partner in old age, and thus have fewer parents-in-law. For other type of affinal kin, low-income men's lower partnering but higher fertility in their kin network(s) results in minor differences by income. Higher union dissolution in the kin network is also associated with more half siblings, as reflected in Figure 1. In general, high-income men have children and partners later in life; this is also reflected in their kin's behavior. The same patterns are found for their kin in an attenuated form. In contrast, low-income men experience events earlier in life, and their descendants have substantially higher fertility, resulting in larger extended kinship networks.

Broadly, the results for women are quite similar to those for men. Figure 3 outlines the social gradient in consanguineous kin for women. For most groups, we found comparable amounts of kin for women with the important exception of children, where the SES gradient was opposite that of men. The lowest earning women had the highest, and highest earning women had the lowest, number of children. In Figure 4, we can see the average number of in-laws for women. We found little social gradient in having a partner for women in contrast to what we found for men (Figure 2), although high SES women were slightly less likely to have a partner early in the life course and more likely to have one later in the life course. As a consequence, there was no distinct SES gradient in the average number of brothers- or sisters-in-law, and the SES gradient was confined to the lowest earning women who had somewhat fewer partners and parents-in-law.

In our supplemental Figures A8 through A11, we show the above figures across educational groups instead of income quartiles. All patterns described in Figures 1 and 2 are present, and the socioeconomic gradient is somewhat more pronounced. For example, the least educated have about two more cousins than those with tertiary education, and the positive educational gradient in having mothers or fathers alive by age 45 is more pronounced.

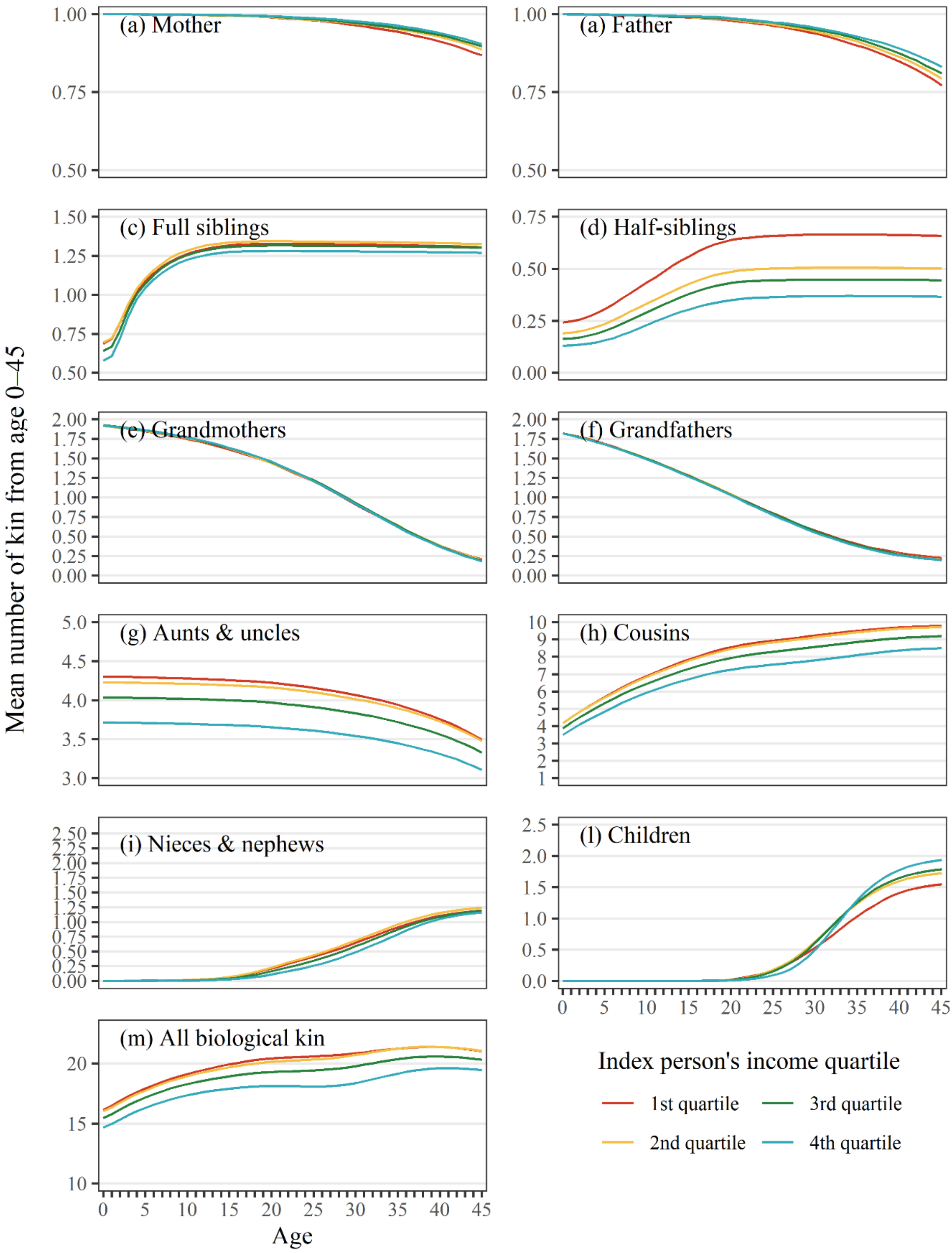

Figure 1. Mean Share of Consanguine Kin at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort, by Earnings Income Rank Measured around Age 40 (Men).

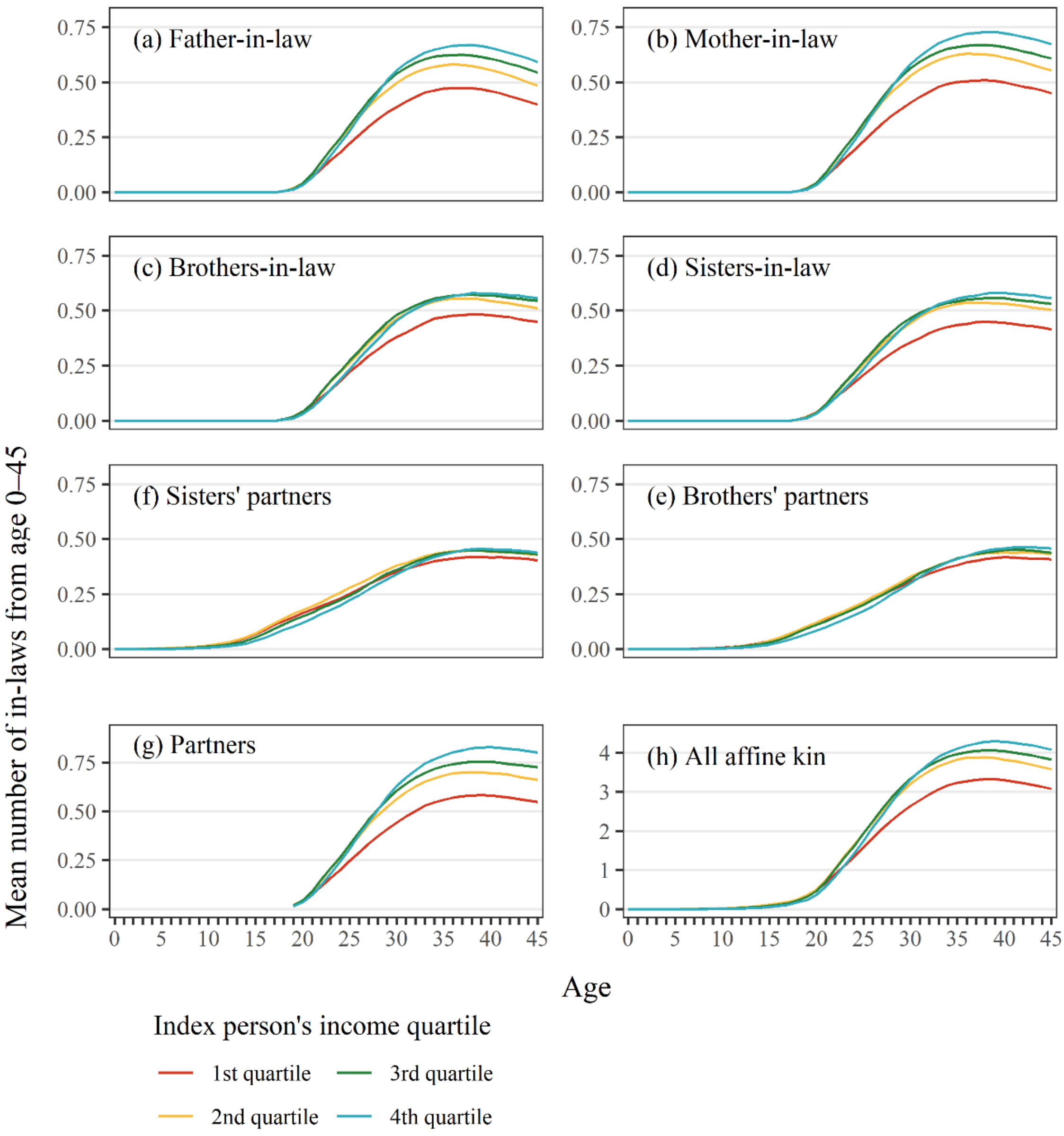

Figure 2. Mean Share of In-law Kin and Partners at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort, by Income Rank Measured around Age 40 (Men).

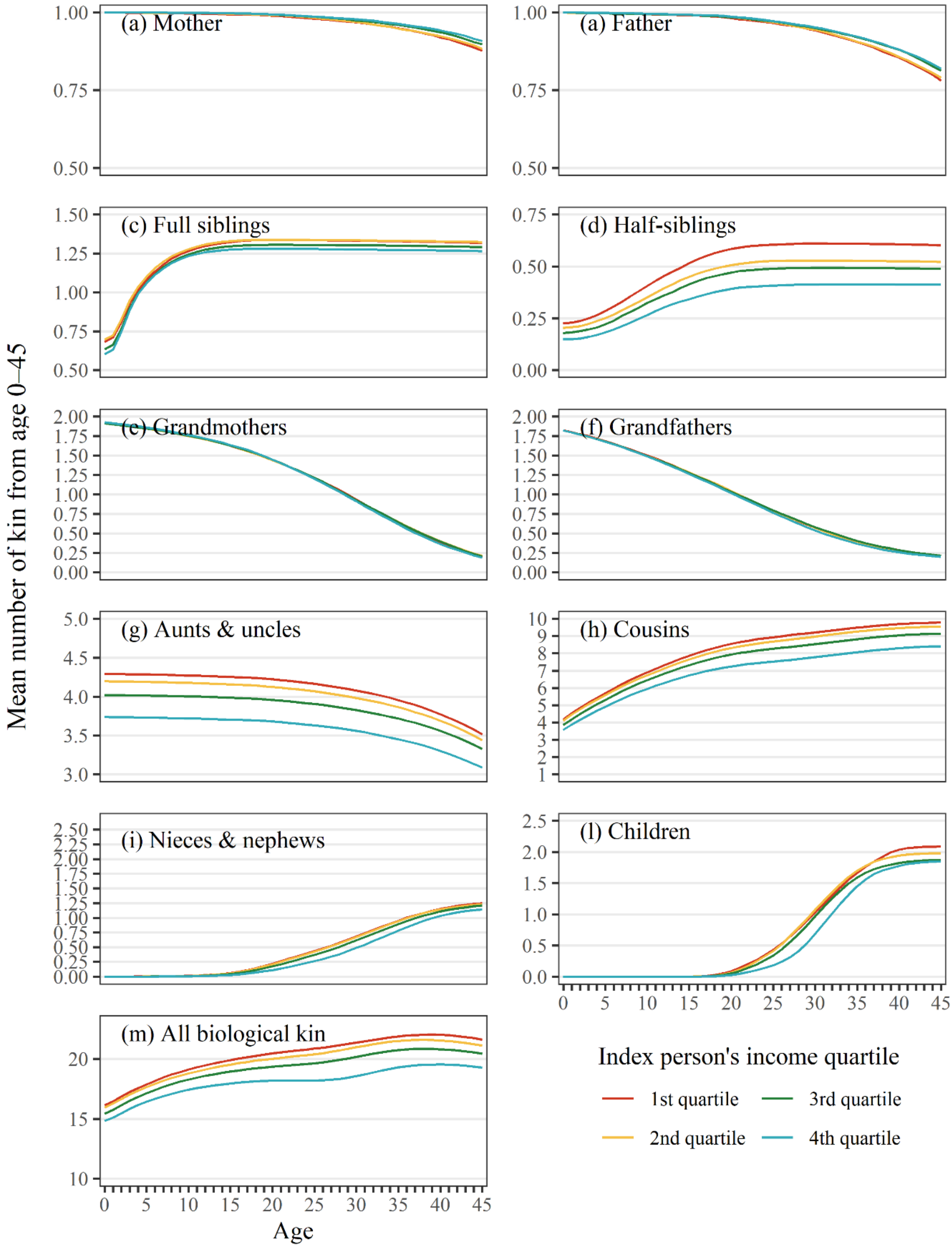

Figure 3. Mean Share of Consanguineous Kin at ages 0 to 45 of the 1973 Swedish-born Birth Cohort, by Income Rank Measured around Age 40 (Women).

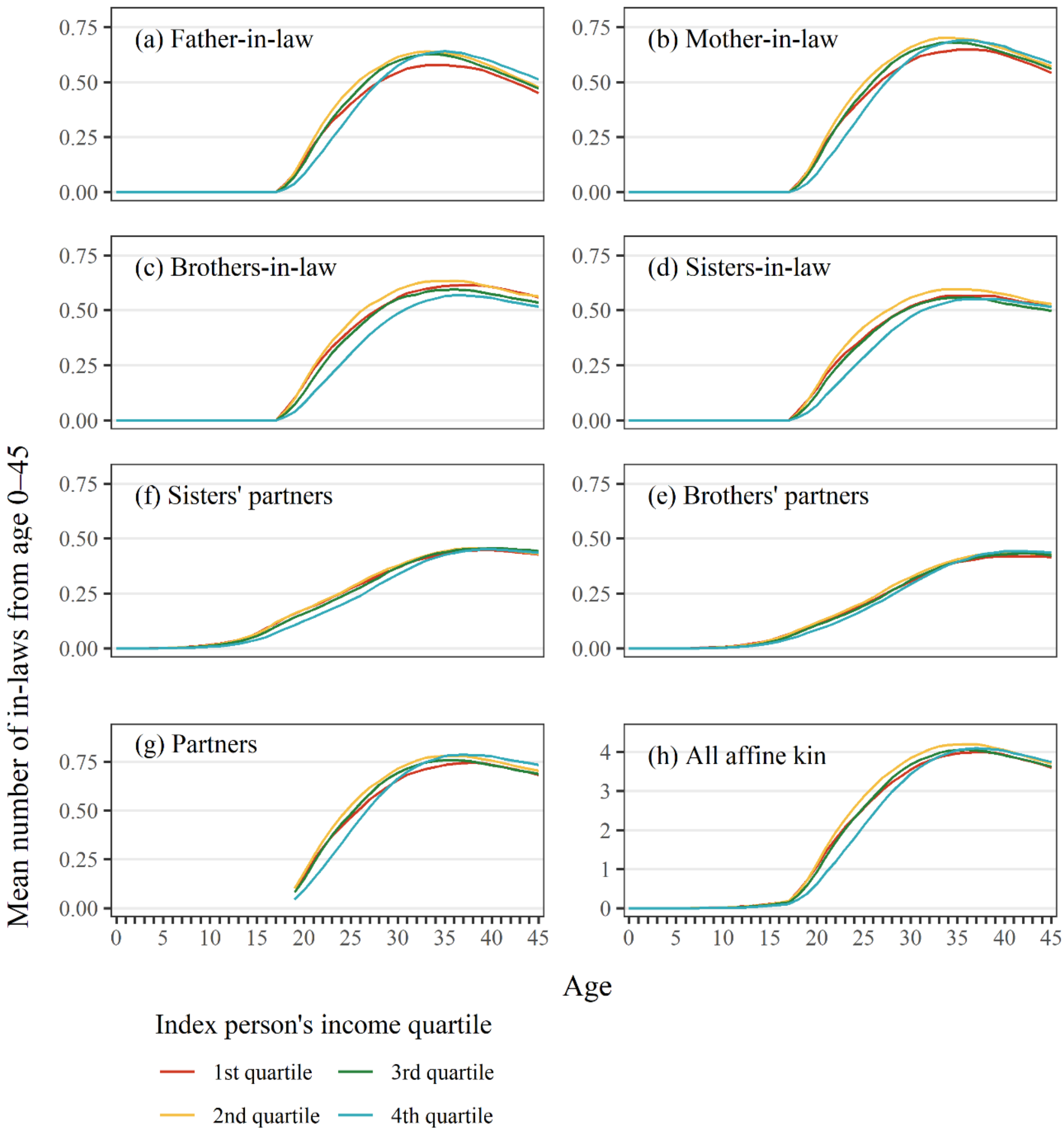

Figure 4. Mean Share of In-law Kin and Partners at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort, by Income Rank Measured around Age 40 (Women).

Differences in Total Number of Kin

After showing how the SES groups differed by specific categories of kin, we examine, as seen in Figure 5, how the total number of kin differed across the life course for all men and women (i.e., not stratified by income). The figures are stacked area plots where the height of a bar indicates the total number of kin at that age. The standard deviations of the total number of kin at specific ages are displayed within brackets. Colors represent generations and affiliations, where kin in the same generation have the same color (for example, parents and aunts/uncles have green gradients).

The total number of kin increased over the life course, with a maximum between age 35 and 40. Overall, the average size of the kinship was similar across the SES groups, ranging from around 13–15 at age 1 and 21–23 by age 45. The size of the total kinship primarily consists of extended horizontal kin, where cousins in the same generation contribute to the largest numbers, followed by aunts/uncles one generation older than the index generation. The size of consanguineous kin (including grandparents, aunts/uncles, parents, and siblings) was rather stable over the life course, though a rising number of cousins increased the total kinship network as the cohort aged. Starting at around age 20, the index generation also started to acquire their own kinship network through their own children, partners, and in-laws, thus adding to their total number of kin. At approximately the same time, their siblings also started having children.

We have also examined the range of the average number of kin, as indicated by standard deviations, which is substantial (the standard deviations in Figure 5), and varied considerably across the life course. At birth, the standard deviation for the average total of kin members was about seven, and increased to about 10 by age 45. Appendix Figures A3 and A4, further suggest that the dispersion in the number of kin was very large, and was large compared to variation across SES. Thus, most variation in kinship is found across individuals within the same SES groups, not across SES groups. SES gradients measured by education (Figures A8 to A16 in the Appendix) were more pronounced, with larger differences between primary and tertiary educated men and women compared to income differences.

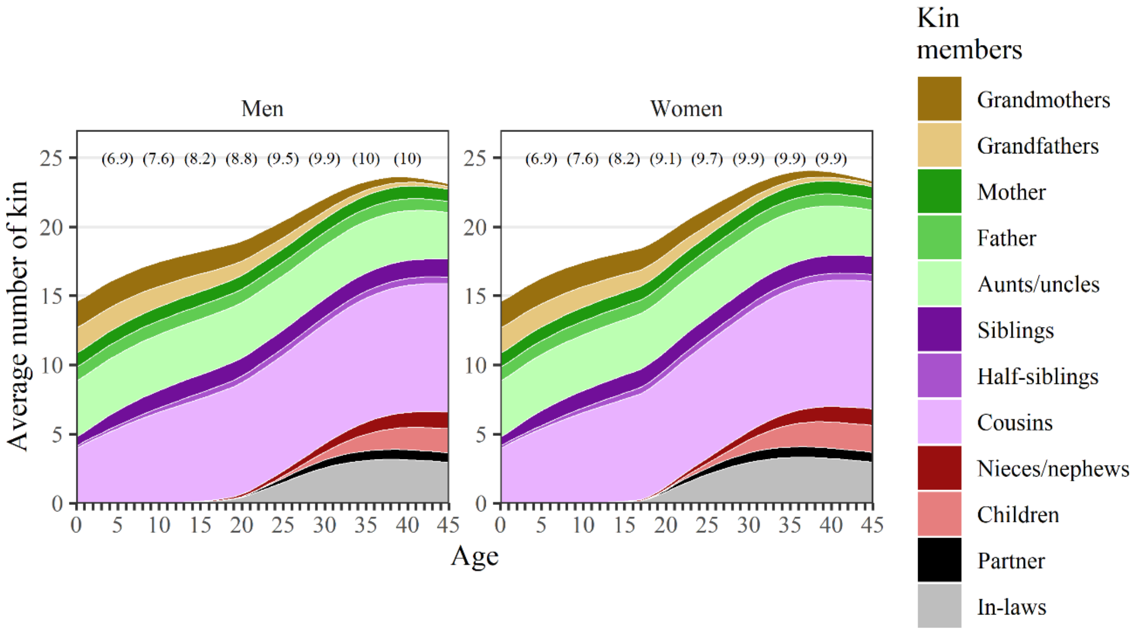

Figure 5. Mean Share of All Consanguineous and Affinal Kin at Ages 0 to 45 in the 1973 Swedish-born Birth Cohort. Standard Deviations of the Total Number of Kin in Parentheses (Men and Women).

Finally, we examine how specific kin members contributed to SES differences in the total number of kin. We compare the number of kin between the first and the fourth income quartile at each age in Figure 6. A positive value indicates that the first income quartile had more kin than the fourth at that age, or in other words, that poorer individuals had more kin than richer individuals. The y-axis shows the difference between the two groups for specific kin. The total

SES difference at a given age is the sum of positive and negative values, and is indicated by the red line. Areas reaching above the horizontal line (positive values) signal that these specific kin groups are more numerous, on average, among the lowest income earners compared to the highest income earners. Areas below the horizontal line (negative values) represent kin groups that are more numerous among the high-income earners.

Two groups of kin contribute mostly to the SES differential between the two income groups. Half siblings, uncles, aunts and, in particular, cousins are more numerous among the lowest income quartile across all ages. In contrast, affinal kin are more numerous among the highest income quartile at higher ages (when more high-income individuals have a partner) for men, but less clearly so for women. Other relations have a marginal impact on the total kinship differential across SES. We also see that the socioeconomic gradient in kinship differs somewhat for men and women, though only later in life, which is due to that we measure the income of our index generation only in adulthood. Own children positively added to the kinship differential for women, but negatively for men. For both men and women, low-income groups have kids earlier, and high SES groups have relatively more children as they age. Second, low SES men experience a stronger decline in in-laws than low SES women. For women, we see that those with low SES have consistently less kin over the life course, while for men, the SES gap shrinks after age 20 as the members of the index cohort age, approaching 0 as high-income men are increasingly more likely to be partnered and have many children as they approach age 45. The summed SES difference (marked by the red line) peaks at about 1.9 kin for men and 2.40 for women, corresponding to between about a fifth to a quarter of a standard deviation.

Appendix Figures A5 and A6 also contrast the second and third quartiles to the fourth quartile, indicating that the SES gradient decreased in magnitude but remained, when we compared medium earners to the richest quartile. Parts of the SES gradients we observe are due to how we define kinship. We illustrate briefly how the socioeconomic gradient in kinship responds to different inclusion criteria, including more narrow definitions of kinship, in Appendix Figure 7A. The gradient decreases with a more narrow definition of kin, but the lower SES groups have more kin than other groups in all different specifications. Using education level as a stratifying variable, we found similar and somewhat more pronounced disparities (Appendix Figure A12). When comparing individuals with basic education to those with tertiary education the difference is much greater (up to 3.25 kin for men and 4.0 for women).

Figure 6. Decomposition of Kin Group Distributions to the Difference in the Average Number of Kin between the Fourth- and First Income Rank, at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort (Men and Women).

Discussion

In this study, we have shown differences across socioeconomic groups in the number of kin in a contemporary society. We used national-level register data of parent-child linkages, partnership information, along with data from tax registers to create kinship networks across the life course of the 1973 birth cohort. We set out to study how kinship differs across socioeconomic groups, and type of kinship, and also which demographic forces matters most for SES differences in kinship.

Overall, we demonstrated that differences in kinship are rather moderate across socioeconomic groups in Sweden. The lowest income quartile in our study population had, on average, more kin than the highest income quartile at a magnitude of about 1–2 kin members, or about one-fifth of a standard deviation. Furthermore, we showed how these differences relate do demographic behavior across generations, as well as the type of kin that contributes to observed socioeconomic disparities in kinship, and the life course of the index population. First, we showed that the extent of social stratification in kinship differs by type of kin. For example, for men, the lowest earning 25% of the 1973 cohort had about 0.5 more uncles/aunts than the highest earning quartile, and about one more cousin. The lowest earning men had substantially fewer in-laws and fewer children than the highest earning 25%, almost 1.75 more so at later ages. Together, the differential in cousins, aunts/uncles, and in-law relations accounted for most of the SES gradients in total number of kin. Second, the findings show that SES differences in living kin differed across the life course. In younger ages, low SES individuals had 1 to 1–1.75 more kin than high SES individuals, though the differences shrank as the cohort aged, in particular for men. Third, the results suggest that socioeconomic differences in kin are larger for women: Women in the lowest income quartile had between 1.75–2 more kin across their adult lives that we measured versus the highest earning quartile. The lowest earning men, in contrast, only had slightly more kin, about 0.5 relations, than the highest earning men at later ages. Overall, our results were broadly similar when using both income and education as stratifying variables, which strengthen the conclusion of a socioeconomic gradient in kinship frequency, but we also found a larger gradient when using education levels of the index cohort.

The differences we observed primarily originated in differences in grandparental fertility, which created larger horizontal kinship networks among low SES groups. We also found that SES differences in the index generations' own demographic behavior, mostly due to higher partnering (and higher union stability) and lower childlessness among high SES men, created a reverse gradient where high SES groups had more children and more in-laws.

There are two primary explanations for social gradients in kinship in our population. A large share of socioeconomic differences in number of kin stems from timing and the quantum of fertility in the grandparental generation. The older generations of low SES index individuals had more and earlier children, resulting in more aunts/uncles and cousins. Other differences where due to SES differences in union stability and the timing of union formation in the index population generation. Low SES groups were substantially less likely to have partners but also had earlier union formation. The lower number of in-laws and partners was especially prevalent among low SES men. In the parental and index generations, we found smaller SES differences in fertility, which explains the relatively smaller impact on kin quantities. Since Sweden is a low-mortality population, mortality played a small role (except for the survival of grandparents). In contrast the intergenerational intervals are somewhat more important, where low SES groups have more densely spaced kinship networks, and thus experience kinship earlier in the life course. Because social mobility is substantial in Sweden, this likely also explains why our index individuals' SES was only moderately linked to their kin members, and therefore being less associated with the kinship structure of the index generation. Our findings may differ in contexts with lower social mobility and more pronounced socioeconomic differences in demographic behavior. In particular societies with large negative SES gradients in childbearing in the 20th century may look very different.

Finally, socioeconomic differences in kinship in Sweden should be considered in light of overall differences in kinship in the population. For example, at age 40, a quarter of the population has roughly more than 28 kin members, while one quarter has less than less than 18 (shown in supplementary figures A3 and A4). This is concurrent with previous research that documented large variation in the size of kinship networks between individuals (Kolk et al., 2021). In contrast to this variation, the differences across socioeconomic groups are smaller. Nevertheless, the differences by income in the number of cousins and in-laws are non-negligible, and educational differences in the total number of kin are even larger.

It is likely that the type of SES measurement influenced both the social positioning of the index cohort and its members' link to intergenerational processes, such as the social transmission of SES and demographic behavior. In our main analysis, we used earnings, but in the supplementary analysis, using education level, we confirmed the direction of the SES gradient in kinship for women and men, and found it to be substantially larger than when stratifying by income earnings rank. This may be because education has a stronger influence on some demographic variables, in particular as age at first childbirth, as compared to earnings.

Our results have implications for kinship demography. A premise for our analysis was that fertility, mortality, and nuptiality vary systematically by SES, and that the SES and demographic behavior of multigenerational kin members are correlated. In contrast, most models relying on rates instead of micro-level empirical data assume that kin members' demographic behavior is uncorrelated, or that society consists of strictly endogamous groups. Hence, most existing findings on kinship demography have likely underestimated the dispersion of kin. Kinship networks appear more homogeneous than they actually are.

Although Ruggles (1991) called for testing kinship models using empirical data as far back as three decades ago, data restrictions have prevented this task from being realized. More recent data sources, such as crowdsourced online genealogies (Stelter & Alburez-Gutierrez, 2022) have identified the role of selection into such data sources, and future work on such data sources may benefit from taking socioeconomic differences and selectivity into account. To such ends, our study provides baseline values of size and variance of living kin in a full population across SES, gender, and age. The Swedish birth cohort of 1973 is clearly a single case but represents an experience shared by many populations where the demographic trajectory of Sweden is comparable to many other Western countries. With future high-quality multi-generational datasets (Bailey et al., 2022), our approach can be used also in other contexts, and our findings can be contrasted to other populations with different patterns of stratified demographic behavior. Hopefully, our study provides a one step towards establishing best practices in kinship demography. It seems advantageous to analyze kinship separately by sex because some stratified demographic processes in this historical period go in the opposing direction for women and men, thus making the population-level SES gradient potentially misleading. Similarly, attention to different types of kin is important when studying social differences in kinship. For example, in Sweden affinal kin are more numerous among high-income earners, while consanguineous kin are more numerous among low-income earners. Our results are also relevant for work on the consequences of kinship (Agree & Glaser, 2009; Margolis & Wright, 2017). To understand kin contact and support, researchers often use self-reported data on relationship to kin. Social mobility research, examining the influence of

Acknowledgements

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Data availability statement

Access to the population registers on which the study is built is restricted, and can be achieved via Statistics Sweden upon purchase, research application and ethics approval.

References

Agree, E. M., & Glaser, K. (2009). Demography of informal caregiving. In P. Uhlenberg (Ed.), *International handbook of population aging* (pp. 647-668). Dordrecht: Springer.

Alburez-Gutierrez, D., Barban, N., Caswell, H., Kolk, M., Margolis, R., Smith-Greenaway, E., .Zagheni, E. (2022). Kinship, Demography, and Inequality: Review and Key Areas for Future Development. *SocArXiv, doi:10.31235/osf.io/fk7x9.*

Amato, P. R. (1996). Explaining the intergenerational transmission of divorce. *Journal of Marriage and the Family*, 628-640.

Andersson, L. (2020). Oh half-brother, where art thou? The boundaries of full-and half-sibling interaction. *Demographic Research, 43*, 431-460.

Andersson, L. (2021). Lifetime parenthood in the context of single-and multiple-partner fertility. *Advances in Life Course Research, 47*, 100355.

Bailey, M., Lin, P., Mohammed, S., Paul, M., Jared, M., Zhang, M., & Prettyman, A. (2022). *LIFE-M: The Longitudinal, Intergenerational Family Electronic Micro-Database. 2022-03-01.* https://doi.org/10.3886/E155186V2. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor].

Bengtson, V. L. (2001). Beyond the nuclear family: The increasing importance of multigenerational bonds. *Journal of Marriage and the Family, 63*(1), 1-16.

Bengtsson, T., Dribe, M., & Helgertz, J. (2020). When did the health gradient emerge? social class and adult mortality in southern Sweden, 1813–2015. *Demography, 57*(3), 953-977.

Blossfeld, H.-P. (2009). Educational Assortative Marriage in Comparative Perspective. *Annual Review of Sociology, 35*(1), 513-530. doi:10.1146/annurev-soc-070308-115913

Bosworth, B. (2018). Increasing disparities in mortality by socioeconomic status. *Annual review of public health, 39*, 237-251.

Breen, R. (2004). *Social Mobility in Europe*. Oxford: Oxford University Press.

Breen, R., Ermisch, J., & Helske, S. (2019). Educational reproduction in Europe: A descriptive account. *Demographic Research, 41*(49), 1373-1400.

Buhr, P., & Huinink, J. (2014). Fertility analysis from a life course perspective. *Advances in Life Course Research, 21*, 1-9.

Caswell, H. (2020). The formal demography of kinship. II. Multistate models, parity, and sibship. *Demographic Research, 42*, 1097-1144.

Chapman, S. N., Lahdenperä, M., Pettay, J. E., & Lummaa, V. (2017). Changes in Length of Grandparenthood in Finland 1790-1959. *Finnish Yearbook of Population Research, 52*, 3-13.

Chudnovskaya, M., & Kolk, M. (2017). Educational expansion and intergenerational proximity in Sweden: developments in geographical distance between young adults and their parents, 1980-2007. *Population, Space and Place, 23*(1), e1973. doi:10.1002/psp.1973

Daw, J., Verdery, A. M., & Margolis, R. (2016). Kin Count (s): Educational and Racial Differences in Extended Kinship in the United States. *Population and Development Review, 42*(3), 491-517.

De Bruycker, T. (2008). Selection versus structure: Explaining family type differences in contact with close kin. *Journal of Family Issues, 29*(11), 1448-1470.

Di Leonardo, M. (1987). The female world of cards and holidays: Women, families, and the work of kinship. *Signs, 12*(3), 440-453.

Dykstra, P. A., & Komter, A. E. (2006). Structural characteristics of Dutch kin networks. In P. A. Dykstra, M. Kalmijn, T. C. M. Knijn, A. E. Komter, A. C. Liefbroer, & C. H. Mulder (Eds.), *Family solidarity in the Netherlands* (pp. 21-42). Amsterdam: Dutch University Press.

Edin, K. A., & Hutchinson, E. P. (1935). *Studies of Differential Fertility in Sweden*. Stockholm: PS King & son.

Furstenberg, F. F. (2020). Kinship reconsidered: Research on a neglected topic. *Journal of Marriage and Family, 82*(1), 364-382.

Galton, F. (1869). *Hereditary genius : an inquiry into its laws and consequences*. London: Macmillan and Co.

Gavrilov, L. A., & Gavrilova, N. S. (2001). Biodemographic study of familial determinants of human longevity. *Population*, 197-221.

Goldstein, J. R., & Warren, J. R. (2000). Socioeconomic reach and heterogeneity in the extended family: contours and consequences. *Social Science Research, 29*(3), 382-404.

Goodman, L. A., Keyfitz, N., & Pullum, T. W. (1974). Family formation and the frequency of various kinship relationships. *Theoretical population biology, 5*(1), 1-27.

Hällsten, M., & Kolk, M. (2022). The shadow of peasant past: Seven generations of inequality persistence in Northern Sweden. *American Journal of Sociology, forthcoming*.

Härkönen, J., & Dronkers, J. (2006). Stability and change in the educational gradient of divorce. A comparison of seventeen countries. *European sociological review, 22*(5), 501-517.

Jalovaara, M., Andersson, L., & Miettinen, A. (2022). Parity disparity: Educational differences in Nordic fertility across parities and number of reproductive partners. *Population Studies, 76*(1), 119-136.

Jalovaara, M., Neyer, G., Andersson, G., Dahlberg, J., Dommermuth, L., Fallesen, P., & Lappegård, T. (2019). Education, gender, and cohort fertility in the Nordic countries. *European Journal of Population, 35*, 563–586. doi:10.1007/s10680-018-9492-2

Kalmijn, M. (2013). The educational gradient in marriage: A comparison of 25 European countries. *Demography, 50*(4), 1499-1520.

Kolk, M. (2014a). Multigenerational transmission of family size in contemporary Sweden. *Population Studies, 68*(1), 111-129. doi:10.1080/00324728.2013.819112

Kolk, M. (2014b). Understanding Transmission of Fertility Across Multiple Generations – Socialization or Socioeconomics? *Research in Social Stratification and Mobility, 35*, 89-103. doi:10.1016/j.rssm.2013.09.006

Kolk, M. (2017). A Life Course Analysis of Geographical Distance to Siblings, Parents and Grandparents in Sweden. *Population, Space and Place, 23*(3), e2020. doi:10.1002/psp.2020

Kolk, M. (2022). The relationship between lifecourse accumulated income and childbearing of Swedish men and women born 1940-1970. *Population Studies, in press*.

Kolk, M., Andersson, L., Pettersson, E., & Drefahl, S. (2021). The Swedish Kinship Universe – A demographic account of the number of children, parents, siblings, grandchildren, grandparents, aunts/uncles, nieces/nephews, and cousins using national population registers. *Stockholm Research Reports in Demography, 2021:28*, 1-46. doi:10.17045/sthlmuni.17704988.v1

Kolk, M., & Hällsten, M. (2017). Demographic and Educational Success of Lineages in Northern Sweden. *Population and Development Review, 43*(3), 491-512.

Lappegård, T. (2020). Future fertility trends are shaped at the intersection of gender and social stratification. *Vienna yearbook of population research, 18*, 1-6.

Lee, R. (1987). Population dynamics of humans and other animals. *Demography, 24*(4), 443-465.

Leopold, T., & Skopek, J. (2015). The Demography of Grandparenthood: An International Profile. *Social Forces*, DOI: 10.1093/sf/sov1066.

Lévi-Strauss, C. (1969[1949]). *The elementary structures of kinship*. London: Eyre & Spottiswood.

Lundberg, I. (2020). Does opportunity skip generations? Reassessing evidence from sibling and cousin correlations. *Demography, 57*(4), 1193-1213.

Lundholm, E., & Malmberg, G. (2009). Between elderly parents and grandchildren: Geographic proximity and trends in four-generation families. *Journal of Population Ageing, 2*(3), 121-137. doi:10.1007/s12062-010-9022-4

Malmberg, G., & Pettersson, A. (2007). Distance to elderly parents: Analyses of Swedish register data. *Demographic Research, 17*(23), 679-704. doi:Artn 23

Mare, R. D. (2011). A multigenerational view of inequality. *Demography, 48*(1), 1-23.

Margolis, R., & Verdery, A. M. (2019). A Cohort Perspective on the Demography of Grandparenthood: Past, Present, and Future Changes in Race and Sex Disparities in the United States. *Demography, 56*(4), 1495-1518.

Margolis, R., & Wright, L. (2017). Healthy grandparenthood: How long is it, and how has it changed? *Demography, 54*(6), 2073-2099.

Milardo, R. M. (2009). *The Forgotten Kin: Aunts and Uncles*. Cambridge: Cambridge University Press.

Murphy, M. (1999). Is the relationship between fertility of parents and children really weak? *Social Biology, 46*(1-2), 122-145. doi:10.1080/19485565.1999.9988991

Murphy, M. (2004). Tracing very long-term kinship networks using SOCSIM. *Demographic Research, 10*, 171-196.

Murphy, M. (2010). Changes in family and kinship networks consequent on the demographic transitions in England and Wales. *Continuity and Change, 25*(01), 109-136.

Murphy, M. (2011). Long Term Effects of the Demographic Transition on Family and Kinship Networks in Britain. *Population and Development Review, 37*(supplement s1), 55-80.

Pilkauskas, N. V., Amorim, M., & Dunifon, R. E. (2020). Historical Trends in Children Living in Multigenerational Households in the United States: 1870–2018. *Demography, 57*(6), 2269-2296.

Rossi, A. S., & Rossi, P. H. (1990). *Of Human Bonding: Parent-Child Relations Across the Life Course*. New York: Aldine de Gruyter.

Ruggles, S. (1993). Confessions of a microsimulator. *Historical Methods: A Journal of Quantitative and Interdisciplinary History, 26*(4), 161-169.

Ruggles, S., & Brower, S. (2003). Measurement of household and family composition in the United States, 1850–2000. *Population and Development Review, 29*(1), 73-101.

Ruggles, S., & Heggeness, M. (2008). Intergenerational coresidence in developing countries. *Population and Development Review, 34*(2), 253-281.

Sarkisian, N., & Gerstel, N. (2004). Kin support among Blacks and Whites: Race and family organization. *American Sociological Review, 69*(6), 812-837.

Schneider, D. M., & Cottrell, C. B. (1975). *The American Kin Universe: A Genealogical Study*. Chicago: Department of Anthropology, University of Chicago.

Schneider, D. M., & Smith, R. T. (1973). *Class Differences and sex roles in American Kinship and family structure*. Engelwood Cliff, NJ: Prentice-hall.

Skirbekk, V. (2008). Fertility trends by social status. *Demographic Research, 18*(5), 145-180.

Skopek, J., & Leopold, T. (2017). Who becomes a grandparent–and when? Educational differences in the chances and timing of grandparenthood. *Demographic Research, 37*, 917-928.

Song, X., & Mare, R. D. (2019). Shared lifetimes, multigenerational exposure, and educational mobility. *Demography, 56*(3), 891-916.

Stelter, R., & Alburez-Gutierrez, D. (2022). Representativeness is crucial for inferring demographic processes from online genealogies: Evidence from lifespan dynamics. *Proceedings of the National Academy of Sciences, 119*(10), e2120455119.

Strathern, M. (1992). *After Nature: English Kinship in the Late Twentieth Century*. Cambridge, UK: Cambridge University Press.

Thaning, M., & Hällsten, M. (2020). The End of Dominance? Evaluating Measures of Socio-Economic Background in Stratification Research. *European sociological review, 36*(4), 533-547. doi:10.1093/esr/jcaa009

Thomson, E., Winkler-Dworak, M., Spielauer, M., & Prskawetz, A. (2012). Union instability as an engine of fertility? A microsimulation model for France. *Demography, 49*(1), 175-195.

Uhlenberg, P. (1996). Mortality decline in the twentieth century and supply of kin over the life course. *The Gerontologist, 36*(5), 681-685.

UNESCO. (2012). *International standard classification of education: ISCED*. Montreal: UNESCO Institute for Statistics.

van der Laan, J., de Jonge, E., Das, M., Te Riele, S., & Emery, T. (2022). A Whole Population Network and Its Application for the Social Sciences. *European sociological review*, jcac026. doi:10.1093/esr/jcac026

Verdery, A. M., & Margolis, R. (2017). Projections of white and black older adults without living kin in the United States, 2015 to 2060. *Proceedings of the National Academy of Sciences, 114*(42), 11109-11114.

Verdery, A. M., Margolis, R., Zhou, Z., Chai, X., & Rittirong, J. (2019). Kinlessness around the world. *The Journals of Gerontology: Series B, 74*(8), 1394-1405.

Wachter, K. W. (1997). Kinship resources for the elderly. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences, 352*(1363), 1811-1817.

Young, M. D., & Willmott, P. (1957). *Family and Kinship in East London*. Glencoe, Ill.: Free Press.

Zagheni, E. (2015). Microsimulation in demographic research. *International encyclopedia of social and behavioral sciences, 15*, 343-346.

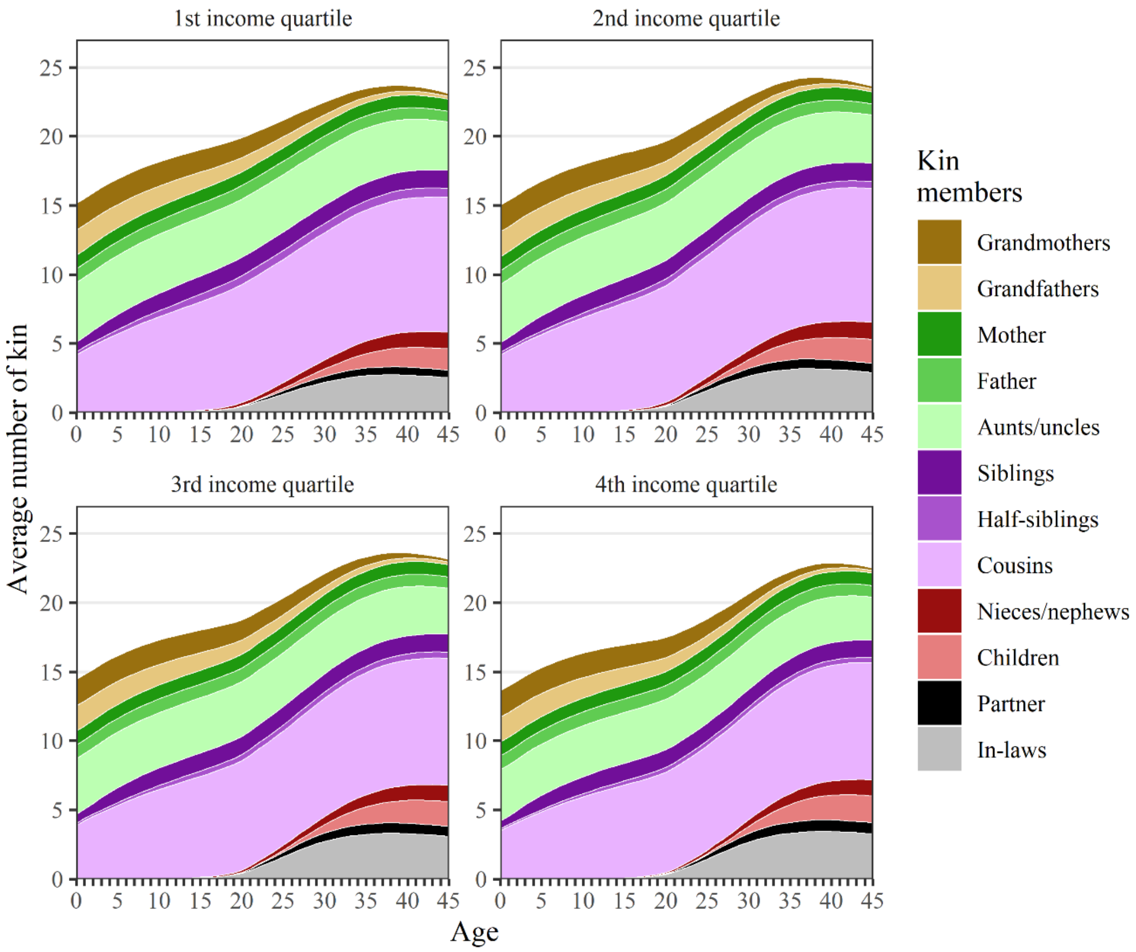

Figure A1. Mean Share of All Biological and Affinal Links at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort, by Income Rank Measured at Age 40 (Men).

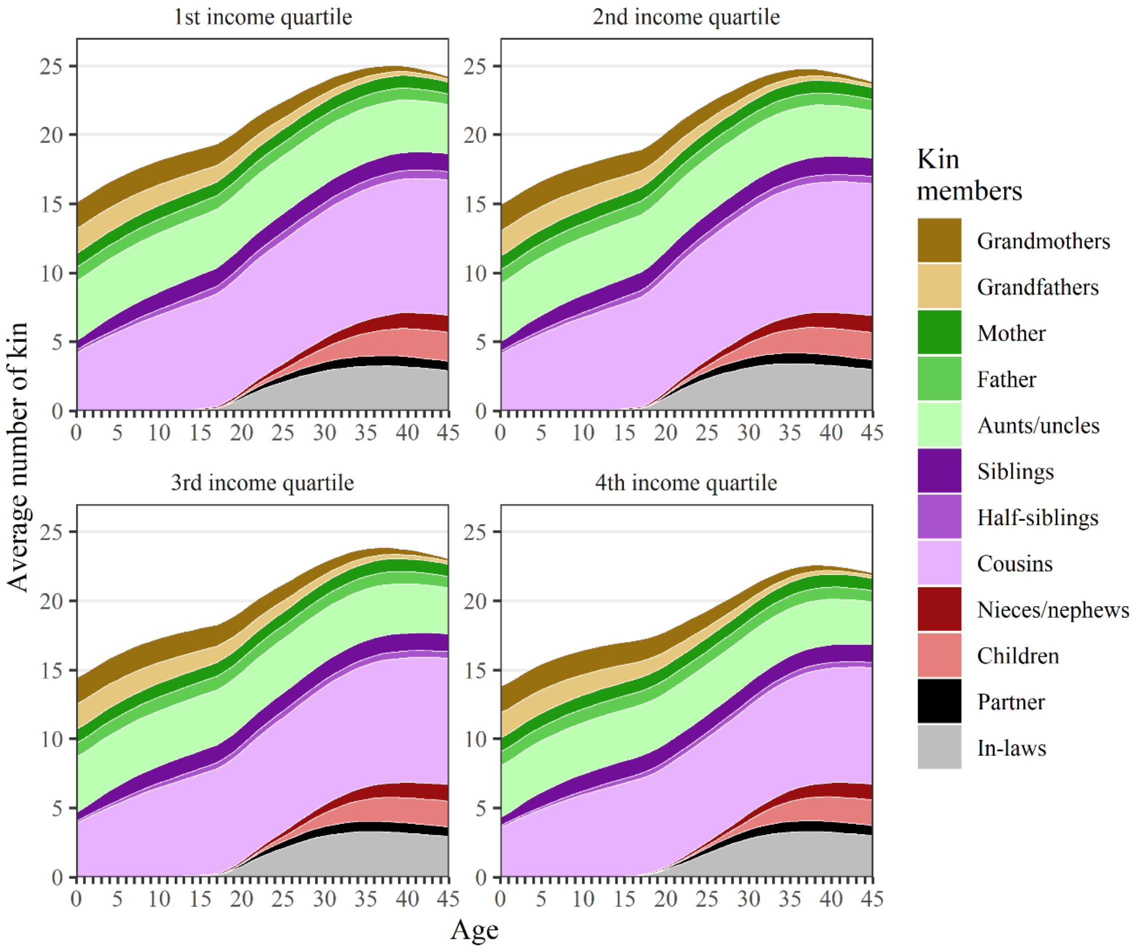

Figure A2. Mean Share of All Biological and Affinal Links at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort, by Income Rank Measured at Age 40 (Women).

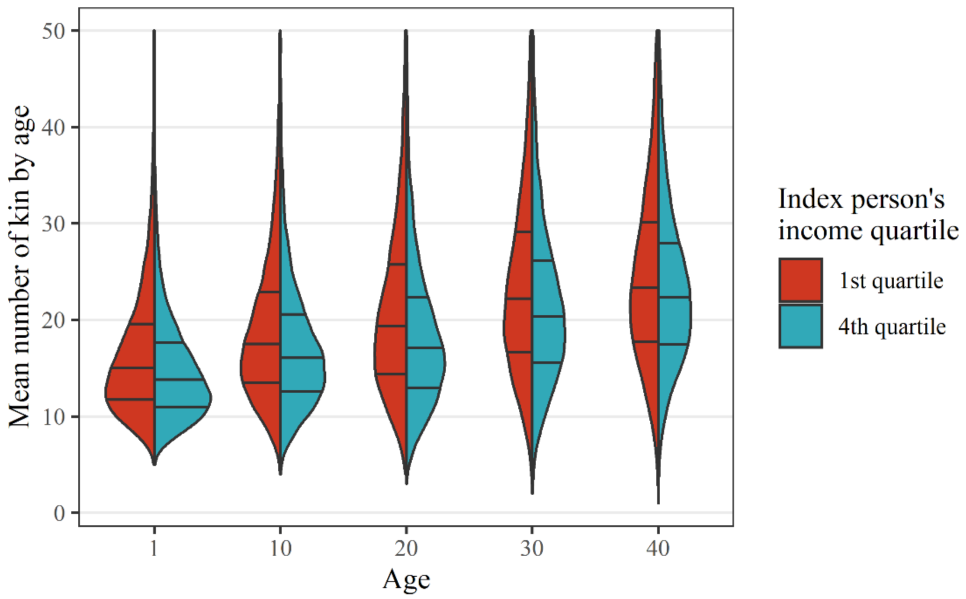

Figure A3. Distribution of Kinship Size at Ages 10, 20, 30, and 40 of the 1973 Swedish-born Birth Cohort for the First- and Fourth Income Rank Quartile; 25th Percentile, Median, and 75th Percentile Indicated by Horizonal Lines.

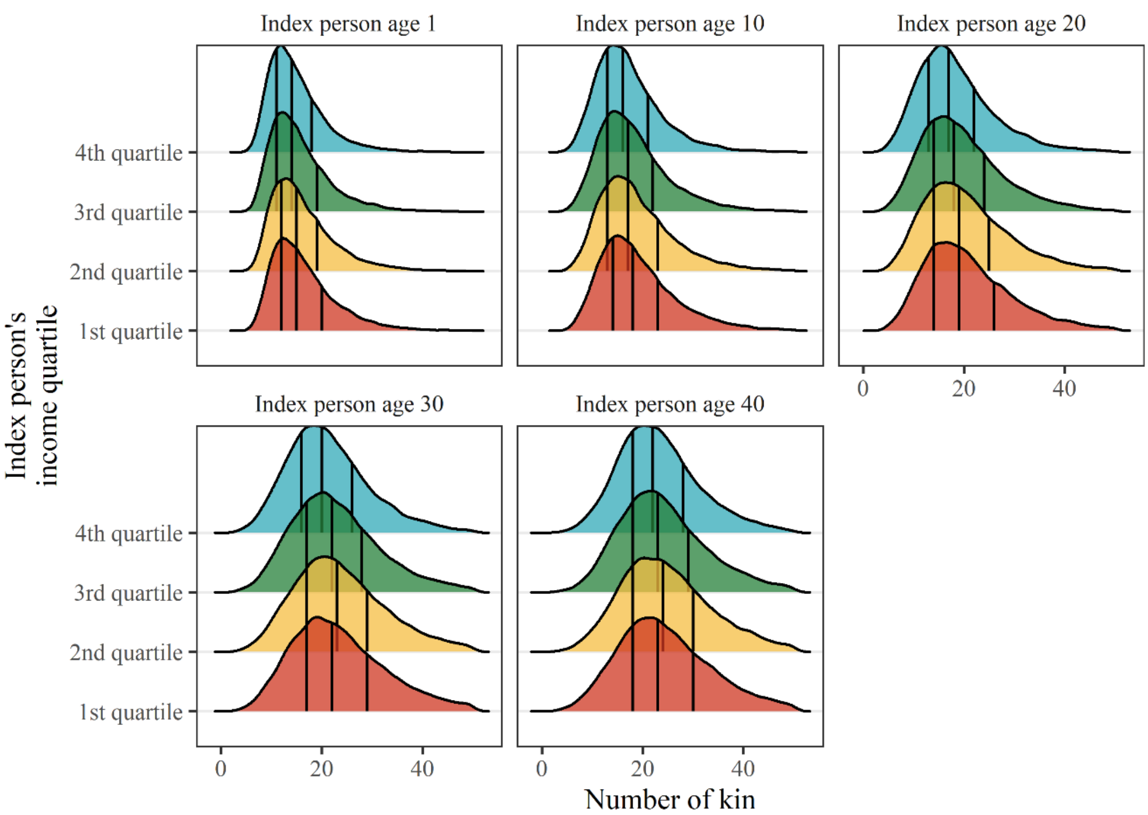

Figure A4. Distribution of Kinship Size at Ages 10, 20, 30, and 40 of the 1973 Swedish-born Birth Cohort Across Income Rank Quartile; 25th Percentile, Median, and 75th Percentile Indicated by Vertical Lines.

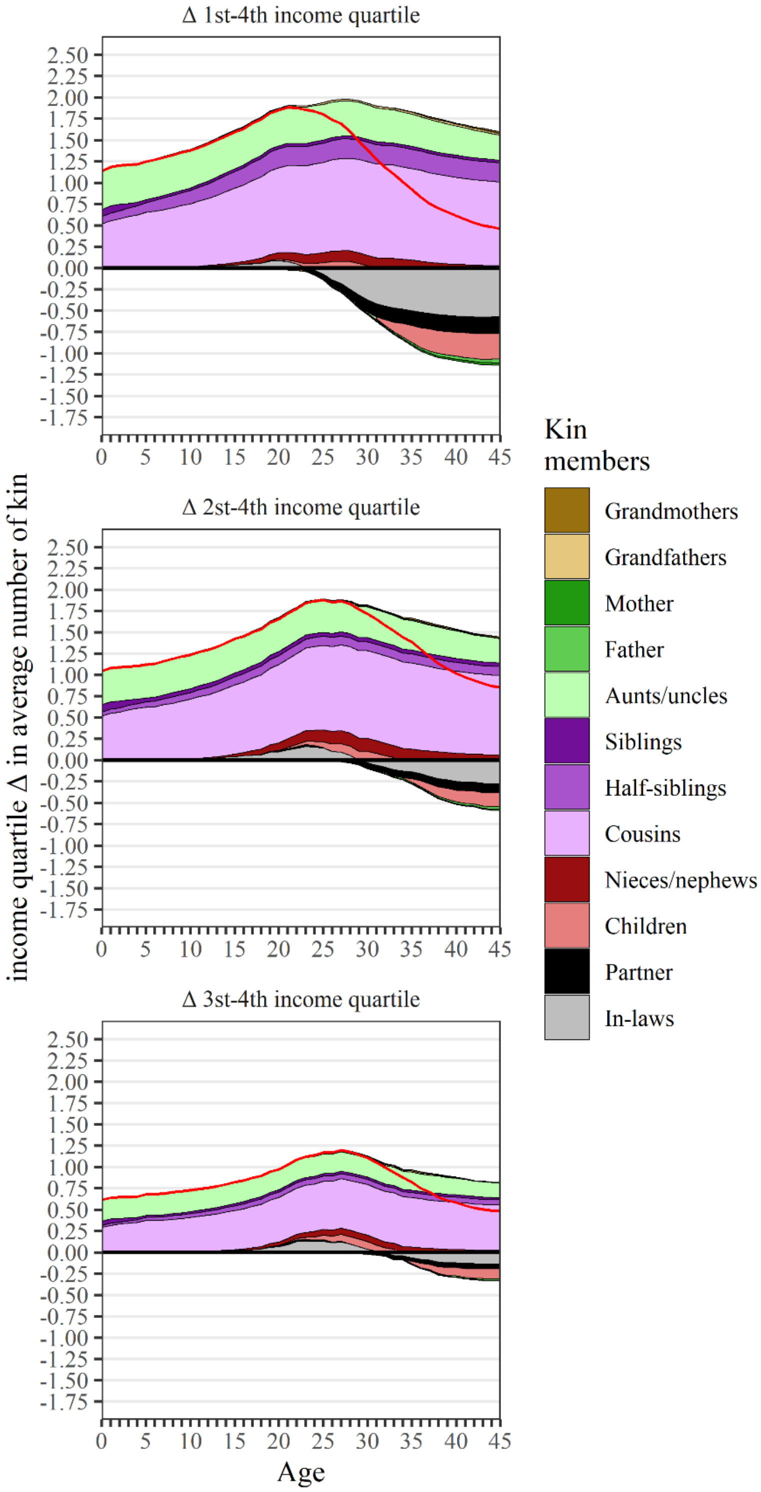

Figure A5. Decomposition of Kin Group Distributions to the Difference in the Average Number of Kin Between the Fourth and First Income Rank, at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort (Men).

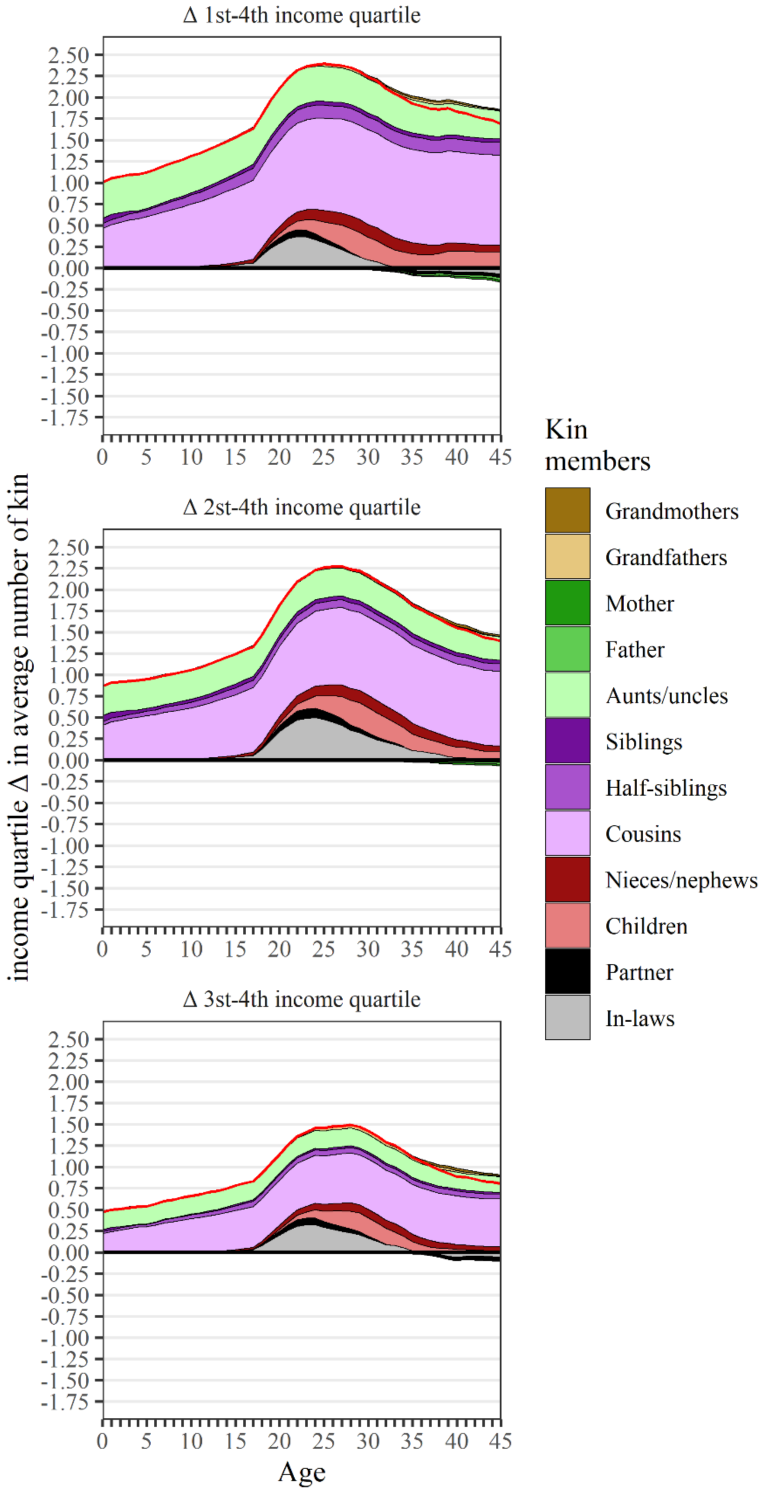

Figure A6. Decomposition of Kin Group Distributions to the Difference in the Average Number of Kin Between the Fourth and First Income Rank, at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort (Women).

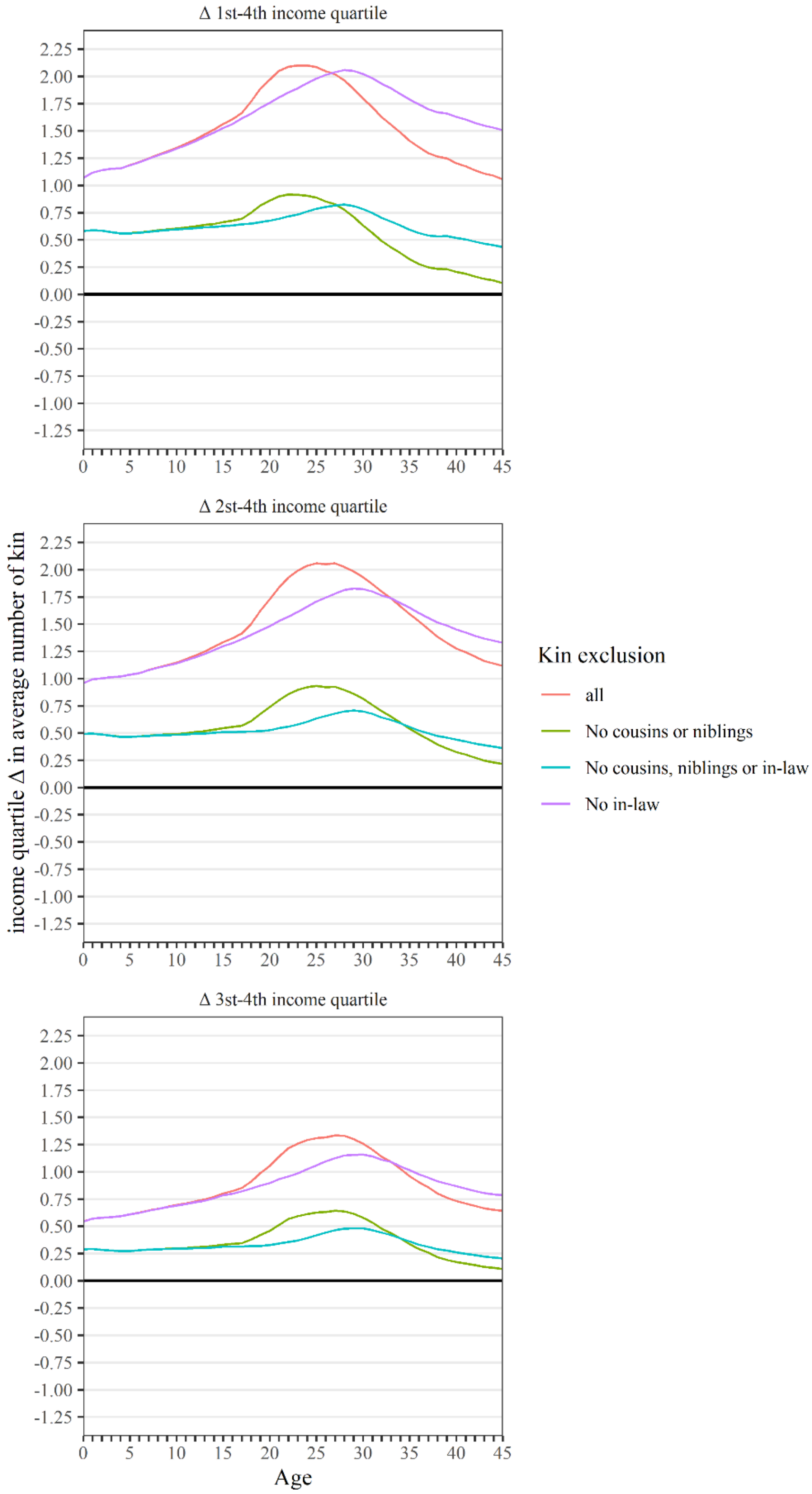

Figure A7. Decomposition of Kin Group Distributions to the Difference in the Average Number of Kin Between the Fourth and First Income Rank, at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort (Total Population) by Different Kinship Exclusion Criteria.

Below, figures A8 to A18 show results equivalent to those of figures 1–6 and Appendix figures A1–A7 when the population is stratified by education level.

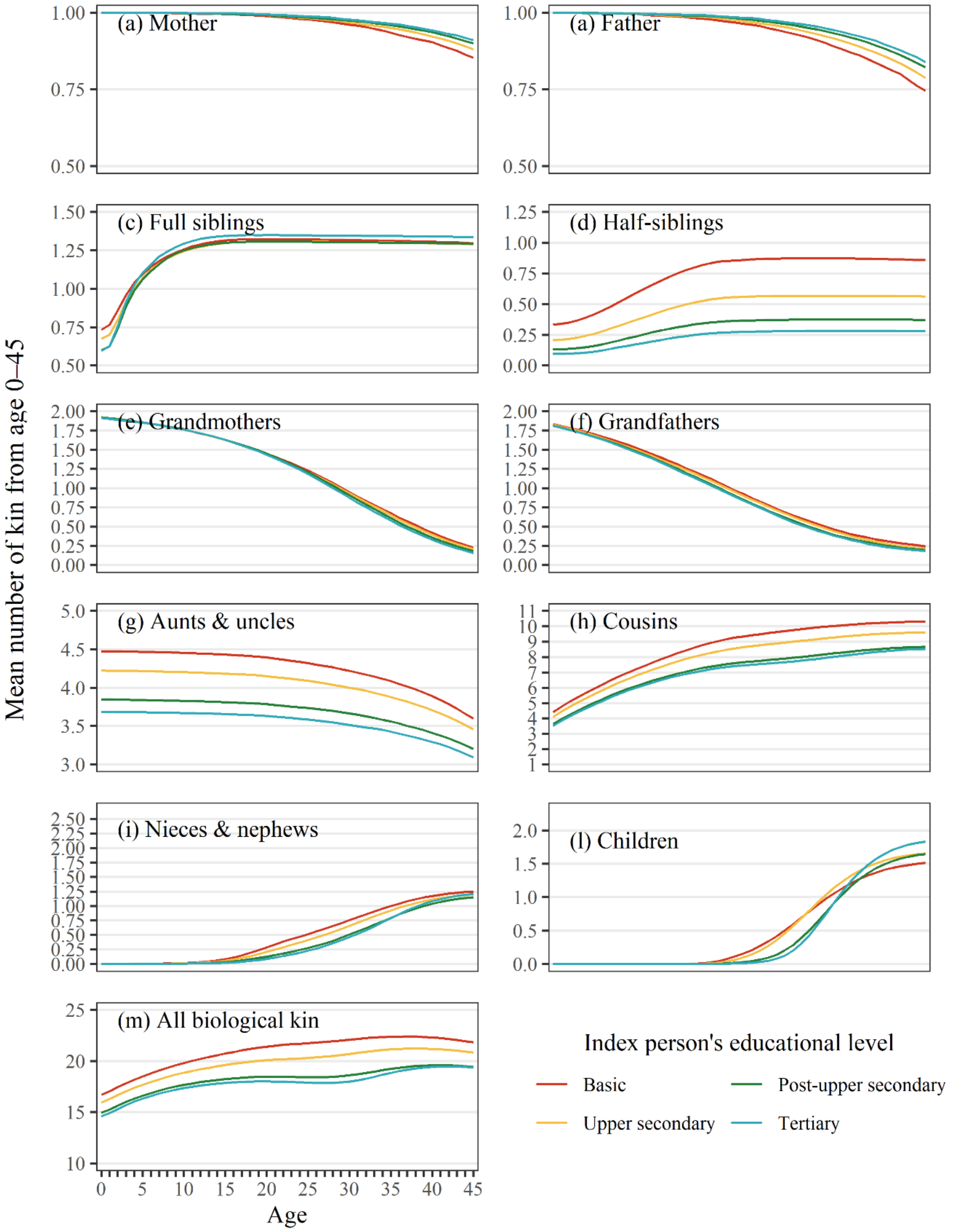

Figure A8. Mean Share of Biological Kin at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort by Education Level, Measured at Age 40 (Men).

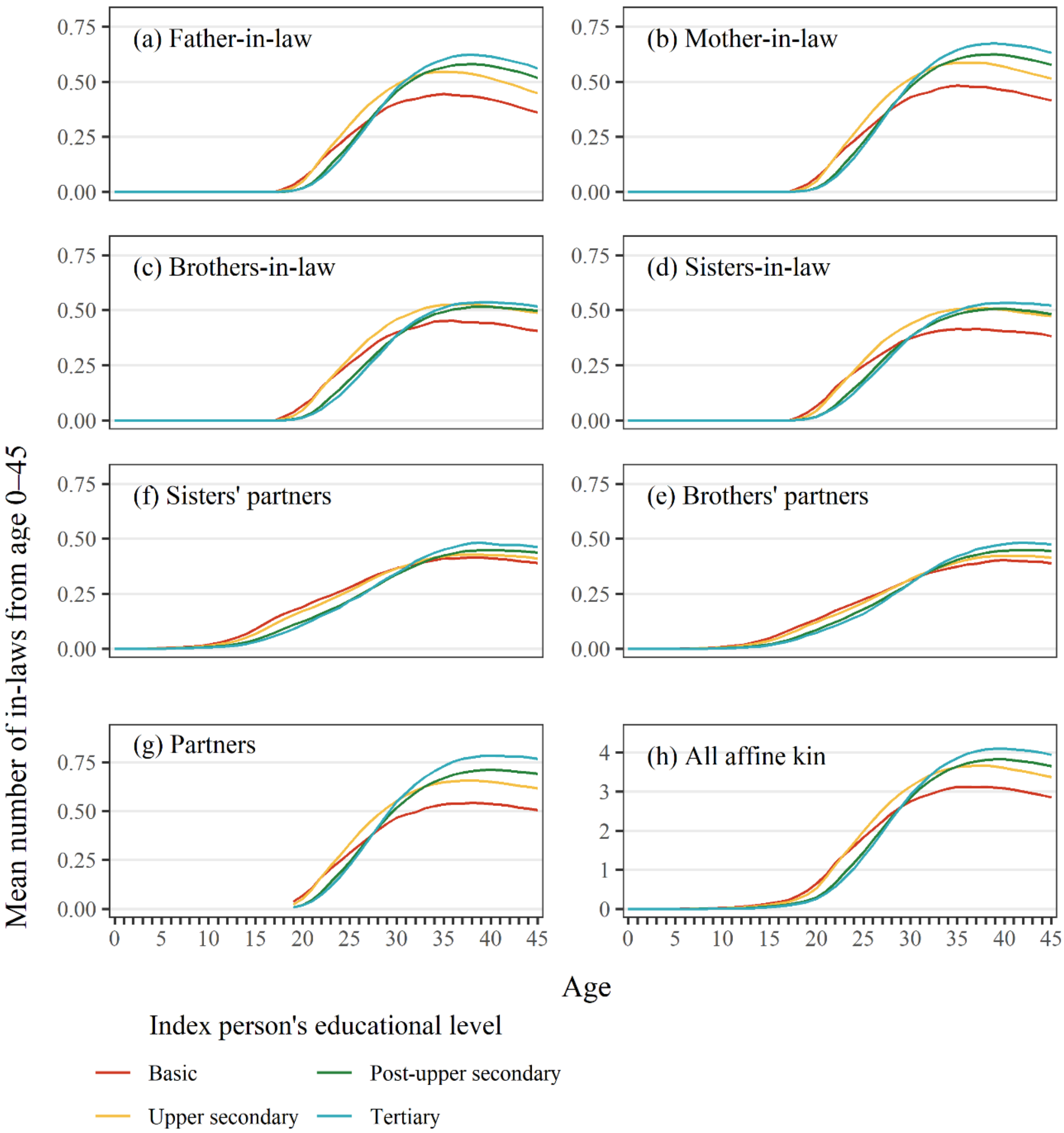

Figure A9. Mean Share of In-law Kin and Partners at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort by Education Level, Measured at Age 40 (Men).

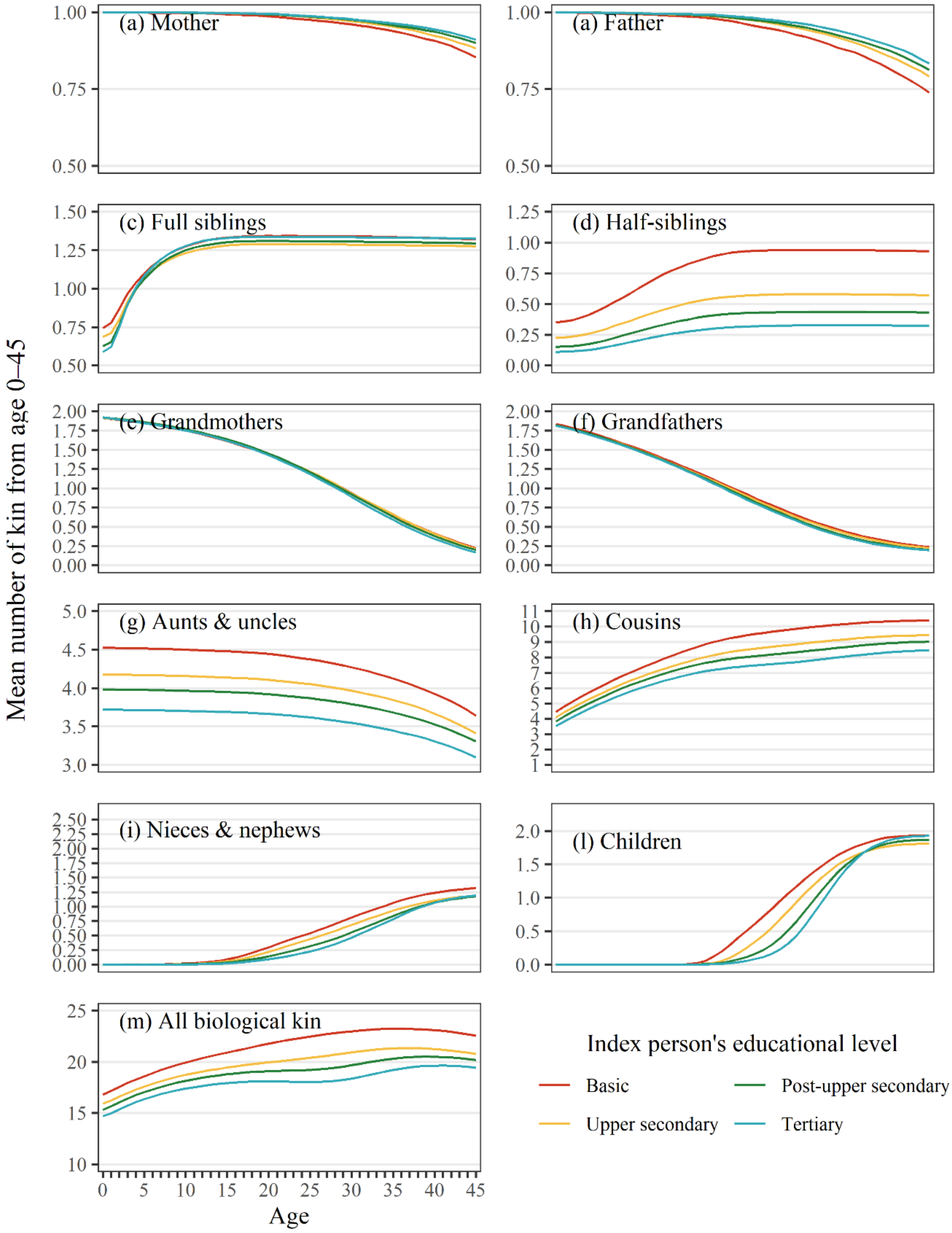

Figure A10. Mean Share of Biological Kin at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort by Education Level, Measured at Age 40 (Women).

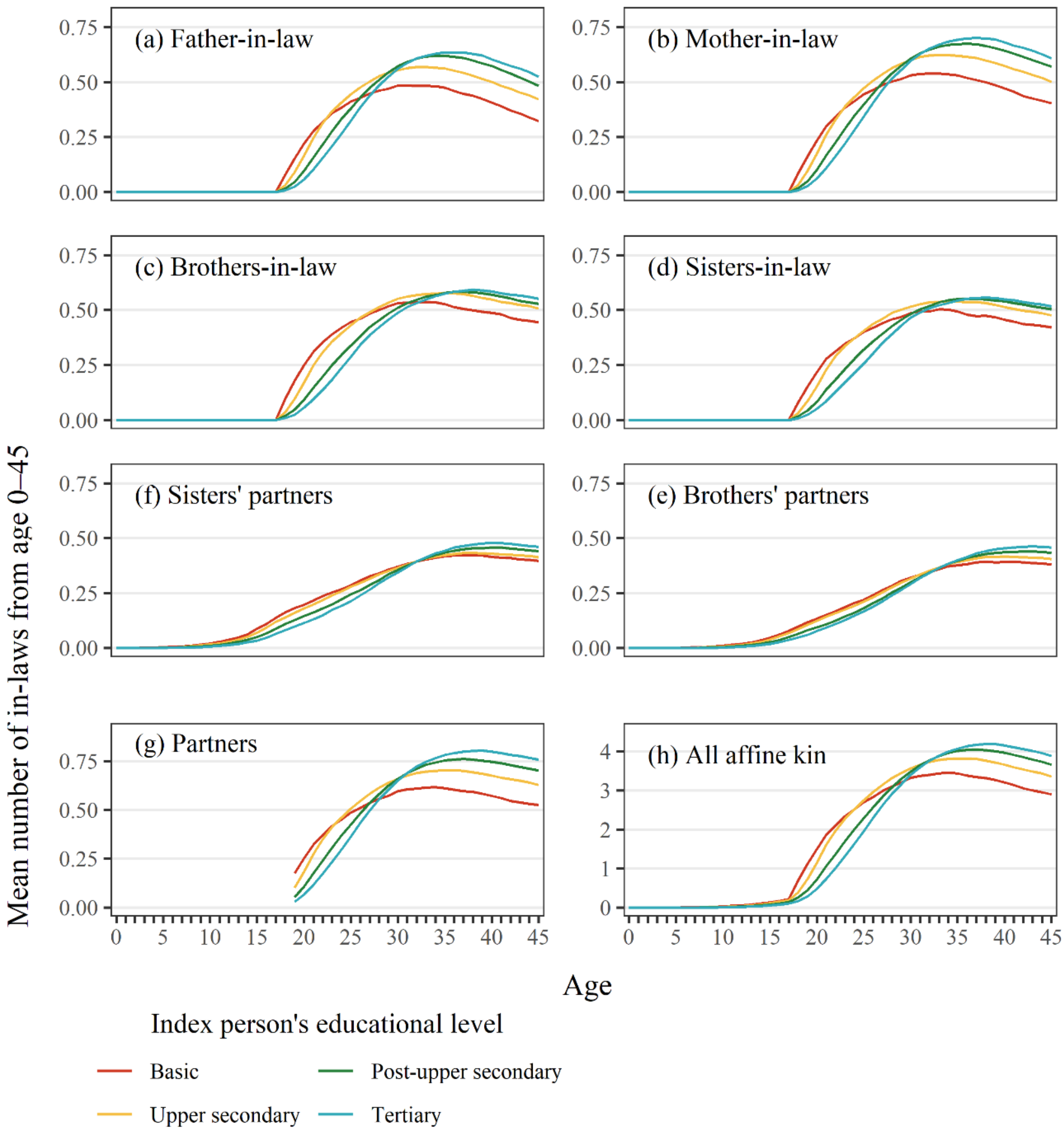

Figure A11. Mean Share of In-law Kin and Partners at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort by Education Level, Measured at Age 40 (Women).

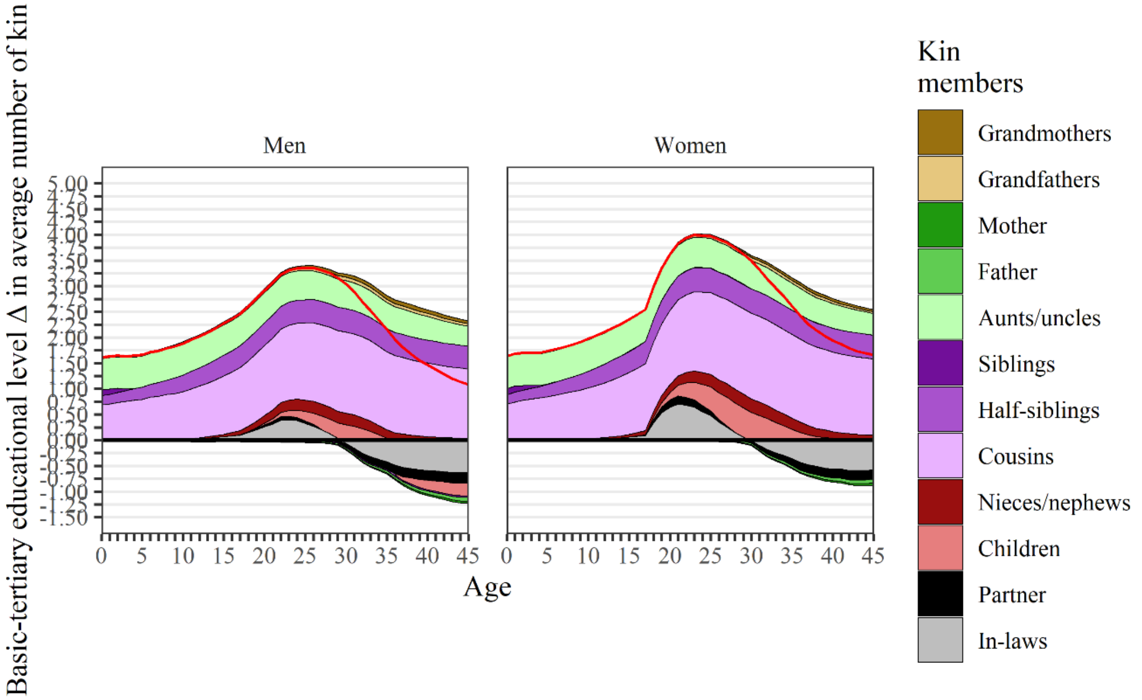

Figure A12. Decomposition of Kin Group Distributions to the Difference in Average Number of Kin Between the Education Levels ISCED0-2 and ISCED6-9, at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort (Men and Women).

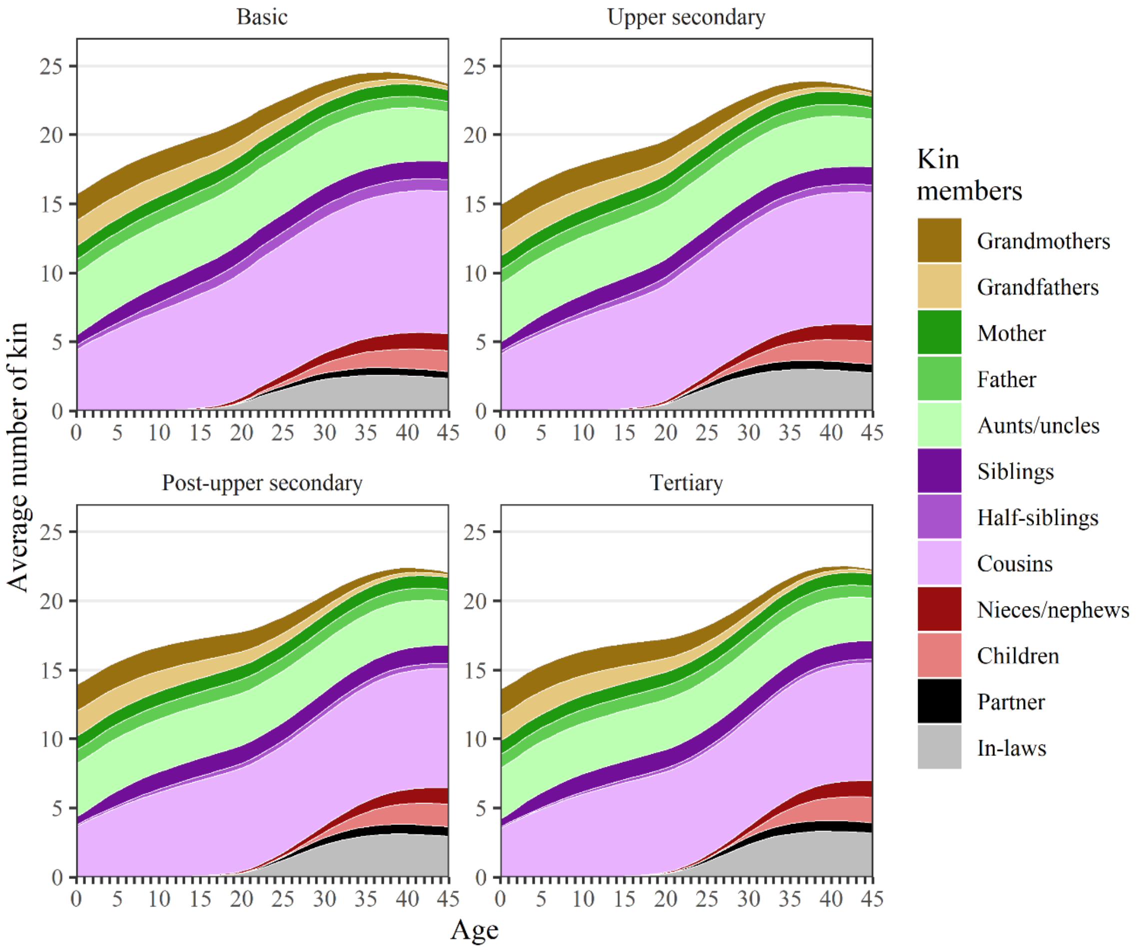

Figure A13. Mean Share of All Biological and Affinal Kin at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort by Education Level, Measured at Age 40 (Men).

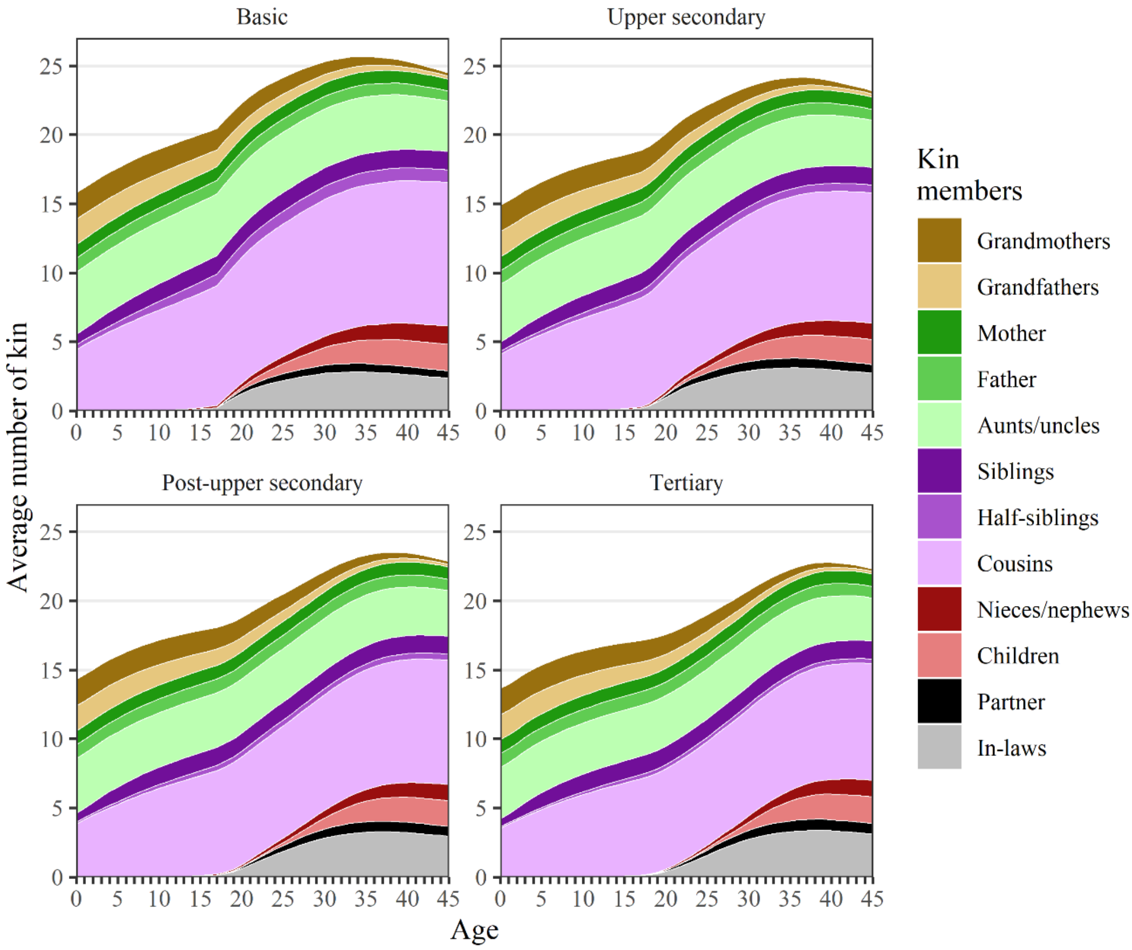

Figure A14. Mean Share of All Biological and Affinal Kin at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort by Education Level, Measured at Age 40 (Women).

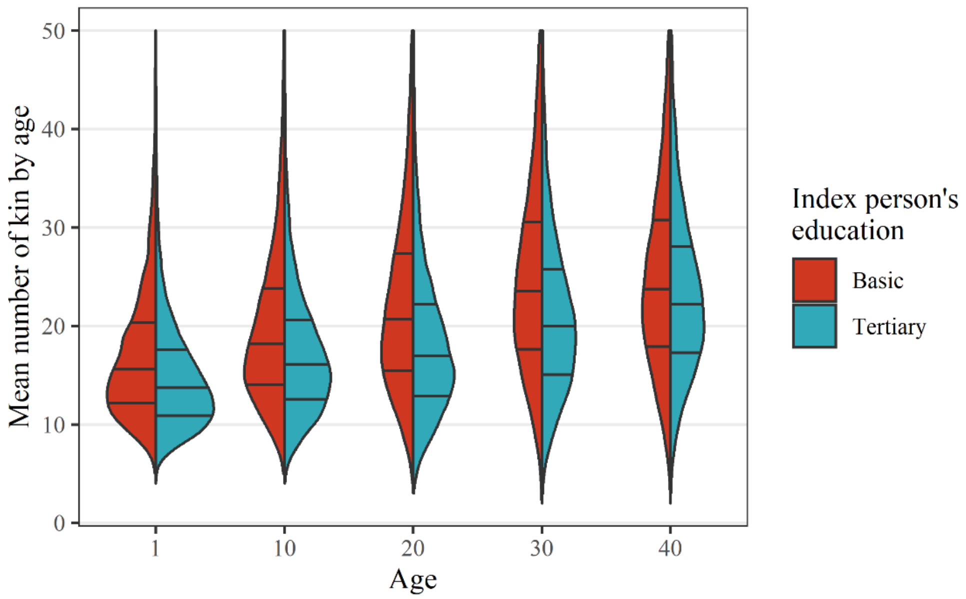

Figure A15. Distribution of Kinship Size at Ages 10, 20, 30, and 40 of the 1973 Swedish-born Birth Cohort for the Education Levels ISCED0-2 and ISCED6-9; 25th Percentile, Median, and 75th Percentile Indicated by Horizontal Lines.

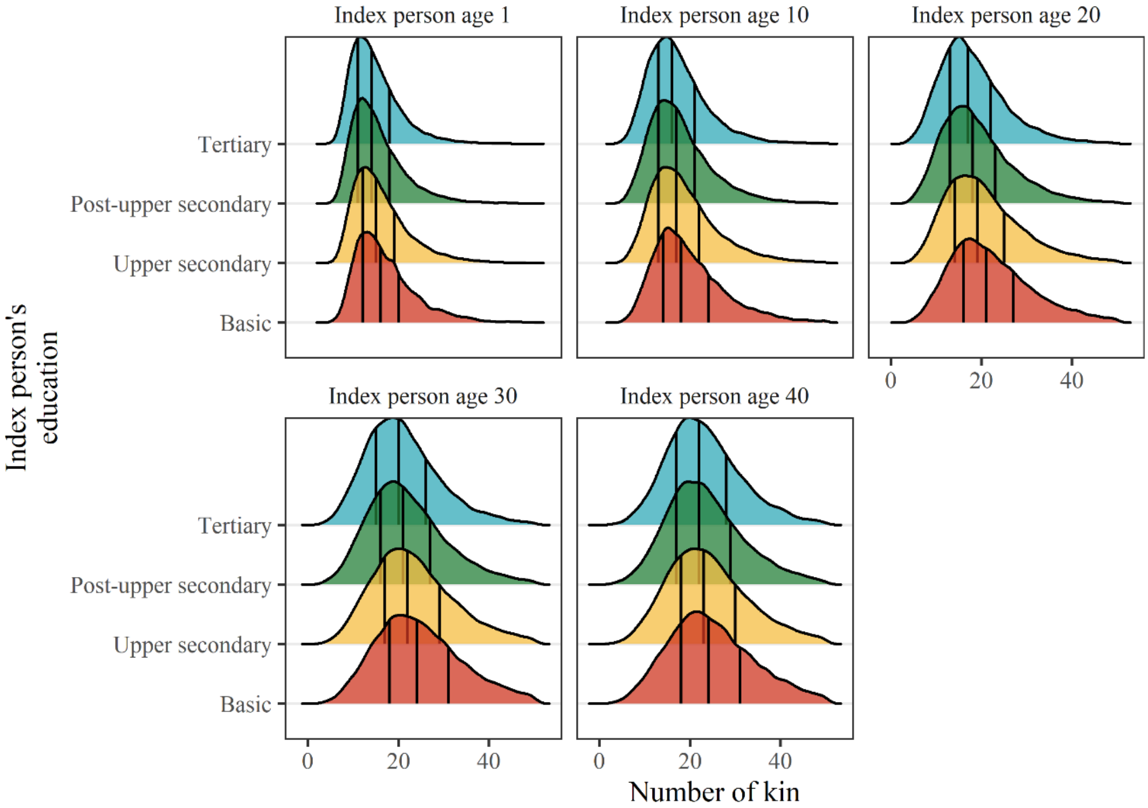

Figure A16. Distribution of Kinship Size at Ages 10, 20, 30, and 40 of the 1973 Swedish-born Birth Cohort Across Education Level Quartile; 25th Percentile, Median, and 75th Percentile Indicated by Vertical Lines.

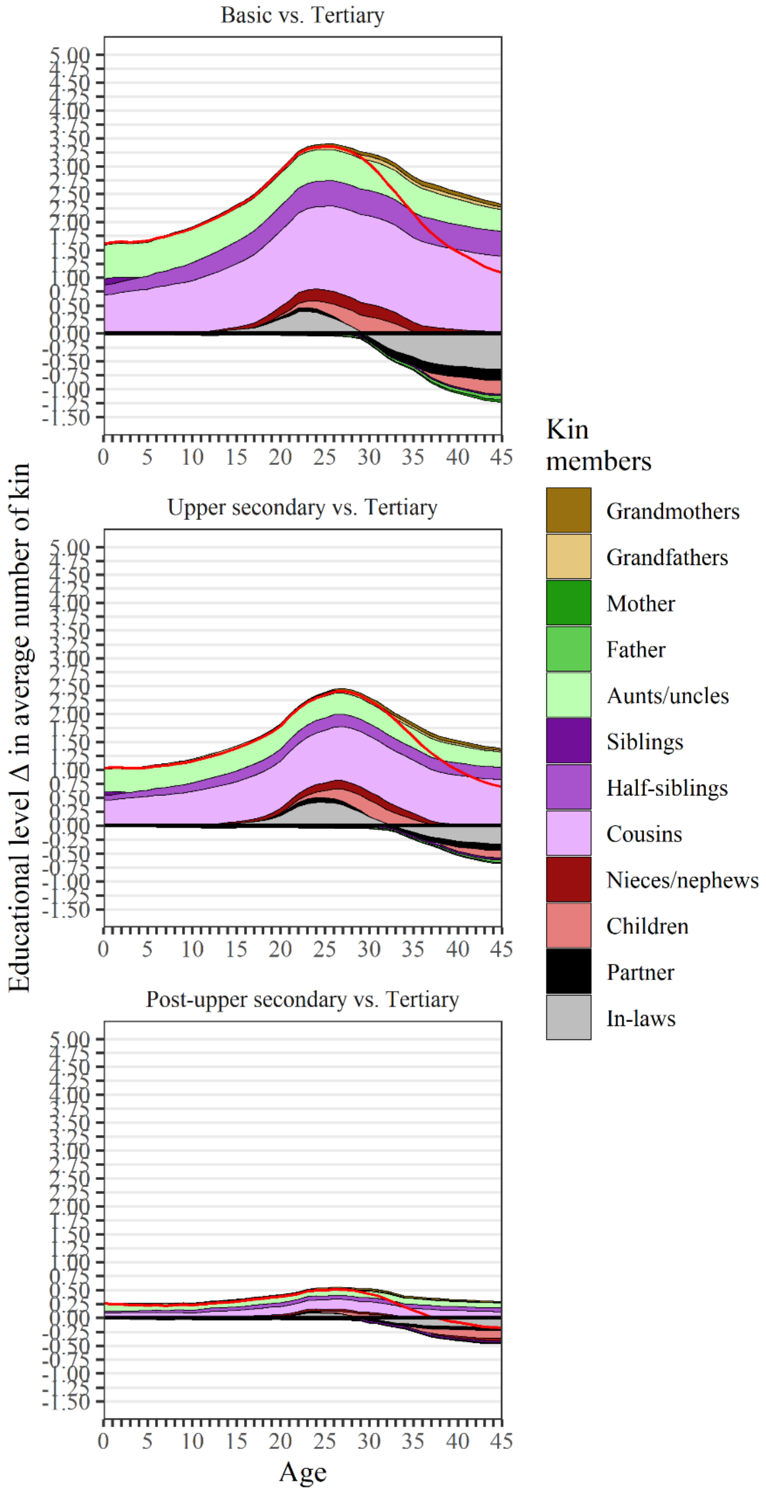

Figure A17. Decomposition of Kin Group Distributions to the Difference in Average Number of Kin Between the Education Levels at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort (Men)

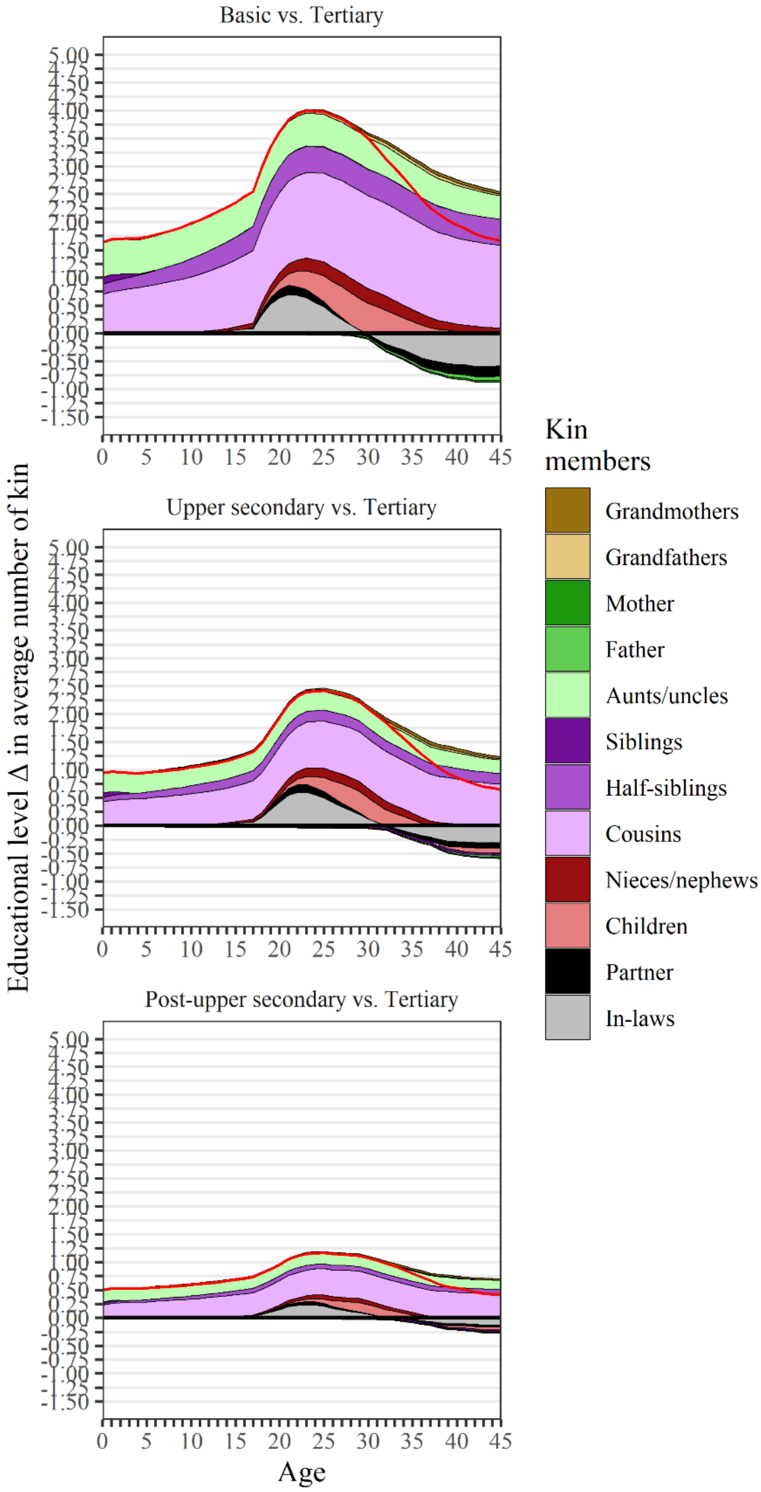

Figure A18. Decomposition of Kin Group Distributions to the Difference in Average Number of Kin Between the Education Levels at Ages 0 to 45 of the 1973 Swedish-born Birth Cohort (Women).

Table A1. Vital Statistics of the 1968 Swedish-born Birth Cohort and Their Kin by Income Rank, Measured at Age 40 (Men).

	Inc. Qrtl.	N	YOB [1]	AFB [2]	CFR [3]	Childl [4]	Marriage [5]	Divorce [6]	Mortiality [7]
Index cohort	All	38,659	1973	31,0	1,61	0,22	0,52	0,07	
	1st	9,927	1973	30,8	1,41	0,32	0,41	0,08	
	2nd	9,383	1973	30,5	1,60	0,22	0,48	0,07	
	3rd	9,485	1973	30,9	1,65	0,19	0,55	0,06	
	4th	9,864	1973	31,8	1,78	0,15	0,64	0,06	
Mothers	All	38,659	1947	23,4	2,53	0,00	0,92	0,18	0,04
	1st	9,927	1947	22,8	2,62	0,00	0,89	0,21	0,05
	2nd	9,383	1947	22,9	2,56	0,00	0,91	0,18	0,05
	3rd	9,485	1947	23,4	2,51	0,00	0,92	0,17	0,04
	4th	9,864	1947	24,3	2,43	0,00	0,94	0,15	0,03
Fathers	All	38,659	1945	25,7	2,50	0,00	0,90	0,15	0,06
	1st	9,927	1945	25,3	2,58	0,00	0,88	0,18	0,07
	2nd	9,383	1945	25,4	2,53	0,00	0,90	0,15	0,07
	3rd	9,485	1945	25,7	2,47	0,00	0,91	0,15	0,06
	4th	9,864	1944	26,3	2,40	0,00	0,93	0,13	0,05
Grandmothers	All	77,318	1917	22,0	3,09	0,00	na	na	0,04
	1st	19,854	1918	21,8	3,20	0,00	na	na	0,04
	2nd	18,766	1918	21,9	3,15	0,00	na	na	0,04
	3rd	18,970	1917	22,0	3,05	0,00	na	na	0,04
	4th	19,728	1917	22,3	2,91	0,00	na	na	0,03
Grandfathers	All	77,318	1914	24,1	2,98	0,00	na	na	0,05
	1st	19,854	1915	24,1	3,06	0,00	na	na	0,05
	2nd	18,766	1914	24,1	3,04	0,00	na	na	0,05
	3rd	18,970	1914	24,0	2,94	0,00	na	na	0,05
	4th	19,728	1914	24,2	2,84	0,00	na	na	0,05
Aunts/Uncles	All	157,930	1947	25,4	1,98	0,15	0,78	0,15	0,06
	1st	42,823	1947	25,1	1,99	0,16	0,76	0,16	0,06
	2nd	39,622	1947	25,1	2,00	0,15	0,77	0,15	0,06
	3rd	38,675	1947	25,5	1,97	0,15	0,78	0,14	0,06
	4th	36,810	1947	26,0	1,95	0,15	0,80	0,14	0,05
Sibling(s)	All	51,351	1973	29,2	1,75	0,20	0,55	0,09	
	1st	13,262	1973	28,6	1,73	0,22	0,52	0,10	
	2nd	12,779	1973	28,6	1,77	0,20	0,53	0,10	
	3rd	12,642	1973	29,3	1,75	0,19	0,56	0,09	
	4th	12,668	1974	30,3	1,75	0,19	0,60	0,08	

[1]Mean year of birth. [2]Mean age of first birth. [3]Mean number of children born by age 40. [4]Percentage with no children born by age 40. [5]Percentage ever married by age 40. [6]Percentage ever divorced by age 40. [7]Percent dead by age 60. All numbers are conditional on observations by 2018.

Table A2. Vital Statistics of the 1968 Swedish-born Birth Cohort and Their Kin by Income Rank, Measured at Age 40 (Women).

	Inc. Qrtl.	N	YOB [1]	AFB [2]	CFR [3]	Childl [4]	Marriage [5]	Divorce [6]	Mortiality [7]
Index cohort	All	36,608	1973	28,7	1,90	0,13	0,59	0,10	
	1st	9,026	1973	28,2	2,04	0,11	0,56	0,12	
	2nd	9,396	1973	28,0	1,94	0,11	0,57	0,09	
	3rd	9,397	1973	28,5	1,82	0,14	0,59	0,10	
	4th	8,789	1973	30,3	1,78	0,14	0,65	0,09	
Mothers	All	36,608	1947	23,3	2,53	0,00	0,92	0,18	0,04
	1st	9,026	1947	22,8	2,60	0,00	0,90	0,20	0,05
	2nd	9,396	1947	23,0	2,56	0,00	0,91	0,18	0,05
	3rd	9,397	1947	23,3	2,51	0,00	0,92	0,17	0,04
	4th	8,789	1946	24,3	2,43	0,00	0,93	0,16	0,03
Fathers	All	36,608	1945	25,6	2,50	0,00	0,91	0,16	0,06
	1st	9,026	1945	25,3	2,56	0,00	0,89	0,18	0,07
	2nd	9,396	1945	25,4	2,53	0,00	0,90	0,15	0,07
	3rd	9,397	1945	25,6	2,48	0,00	0,91	0,15	0,06
	4th	8,789	1944	26,3	2,44	0,00	0,93	0,15	0,05
Grandmothers	All	73,216	1917	22,0	3,09	0,00	na	na	0,04
	1st	18,052	1918	21,8	3,18	0,00	na	na	0,04
	2nd	18,792	1918	21,9	3,13	0,00	na	na	0,04
	3rd	18,794	1918	21,9	3,07	0,00	na	na	0,04
	4th	17,578	1917	22,3	2,94	0,00	na	na	0,03
Grandfathers	All	73,216	1914	24,1	2,98	0,00	na	na	0,05
	1st	18,052	1914	24,1	3,06	0,00	na	na	0,05
	2nd	18,792	1914	24,1	3,00	0,00	na	na	0,05
	3rd	18,794	1914	24,0	2,97	0,00	na	na	0,05
	4th	17578	1913	24,2	2,88	0,00	na	na	0,04
Aunts/Uncles	All	149,173	1947	25,4	1,97	0,15	0,78	0,15	0,06
	1st	38,841	1947	25,1	1,99	0,15	0,77	0,15	0,06
	2nd	39,098	1947	25,2	1,98	0,15	0,77	0,15	0,06
	3rd	38,220	1947	25,4	1,97	0,15	0,77	0,15	0,06
	4th	33,014	1947	25,9	1,93	0,16	0,79	0,14	0,06
Sibling(s)	All	48,518	1973	29,2	1,74	0,20	0,54	0,09	
	1st	12,109	1973	28,5	1,76	0,21	0,53	0,10	
	2nd	12,608	1973	28,7	1,75	0,20	0,54	0,09	
	3rd	12,412	1973	29,1	1,75	0,20	0,54	0,08	
	4th	11,389	1974	30,4	1,70	0,20	0,57	0,08	

[1]Mean year of birth. [2]Mean age of first birth. [3]Mean number of children born by age 40. [4]Percentage with no children born by age 40. [5]Percentage ever married by age 40. [6]Percentage ever divorced by age 40. [7]Percent dead by age 60. All numbers are conditional on observations by 2018.

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