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Replication

A parallel kinship universe? A replication of Kolk et al. (2023) with Dutch register data on kinship networks

Vera de Bel

Eszter Bokányi

Karsten Hank

Thomas Leopold

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Vera de Bel[1,2,3]

Eszter Bokányi[3,4]

Karsten Hank[5]

Thomas Leopold[5]

Abstract

BACKGROUND
Kolk et al. (2023) use Swedish register data to provide a detailed numerical account of biological kinship. Applying their approach in other countries is challenging due to high data requirements.

OBJECTIVE
We examine whether Kolk et al.'s (2023) findings generalize to another demographically advanced country, the Netherlands, and assess how differences in cohort fertility and divorce rates influence the prevalence of different kin types.

METHODS
We analyze kinship network data for the entire Dutch population in 2018, focusing on ties to grandchildren, children, nieces, nephews, siblings, cousins, parents, aunts, uncles, and grandparents.

RESULTS
First, we find strong similarities between Dutch and Swedish kinship structures, extending the picture drawn by Kolk et al. (2023) to another demographically advanced Western context. Second, we show how the Dutch baby boom has trickled down across generations, leading to larger numbers of aunts, uncles, and cousins. Third, we show how differences in other family-related behaviors – specifically divorce and separation – shape the composition of kinship networks and cross-national differences, evident in a substantially lower number of half-siblings in the Netherlands than in Sweden.

[1] ICS/Department of Sociology, University of Groningen, the Netherlands. Email: v.de.bel@rug.nl.
[2] Netherlands Interdisciplinary Demographic Institute, The Hague, the Netherlands.
[3] Statistics Netherlands (CBS), The Hague, the Netherlands.
[4] LIACS, Leiden University, the Netherlands.
[5] Department of Sociology and Social Psychology, University of Cologne, Germany.

CONTRIBUTION

This replication underlines the benefits of empirically validating kinship statistics derived from microsimulations and aggregate demographic data.

1. Introduction

While acknowledging the complexity and diversity of contemporary families (Seltzer 2019), demographers' dominant perspective on 'the family' remains focused on nuclear relations and largely neglects other kin (Furstenberg 2020). Moreover, most studies investigating the role of families in providing social support capture only a small fraction of an individual's "kinship reservoir" – the demographic family reserve of potentially supportive ties which can be activated, deactivated, or reactivated over the life course (Cullati, Kliegel, and Widmer 2018). To obtain a fuller picture of the family network's potential influence through social support or the transmission of (dis)advantage, we need more quantitative knowledge about extended kinship structures.

Recent research has begun to fill in this gap, mostly building on microsimulations and formal models (Alburez-Gutierrez, Williams, and Caswell 2023). A recent assessment of The Swedish Kinship Universe by Kolk, Andersson, Pettersson, and Drefahl (2023; henceforth: KAPD), published in Demography, advances previous research in several ways. Using data for the entire Swedish population in 2017, the authors provide a detailed numerical account of biological kinship (population averages as well as distributions and dispersion). The analysis reveals substantial heterogeneity in kinship size within the Swedish population, a dominance of horizontal ties in adult kin networks, a growing prevalence of 'complex' kin relations, and some differences between matrilineal and patrilineal kin.

Even though KAPD (page 1380) argue that "many of our results can probably be generalized to demographically similar contexts", empirical assessments beyond the Swedish context are complicated by exceptionally high data requirements. We replicate KAPD using one of the few datasets suitable to do so. We compare Swedish kinship networks as presented by KAPD to Dutch kinship networks consisting of ties to grandchildren, children, nieces, nephews, siblings, cousins, parents, aunts, uncles, and grandparents.

Despite overall similar demographic trends in the Netherlands and Sweden, there are also noteworthy differences. First, the Netherlands experienced a more intense baby boom, evident in higher fertility among Dutch women born before World War II. Second, following this boom the Netherlands saw a sharper decline, with cohort fertility dropping below Swedish levels from 1955 onwards (Human Fertility Database 2023). Third, the

two countries show long-standing differences in terms of union stability. Sweden has spearheaded trends in family diversity, showing an early and sustained rise of divorce and multi-partner fertility. Consequently, the prevalence of complex kin such as half-siblings is expected to be higher in Sweden than in the Netherlands (Eurostat 2024).

In this replication we assess, first, the extent to which the Swedish findings by KAPD are generalizable to another demographically advanced population. Second, we investigate the extent to which differences in fertility and union instability affect the frequency of different kin types. Beyond this comparison, our replication contributes a further empirical validation of kinship statistics calculated from microsimulations and aggregate fertility and mortality data.

2. Data and method

Statistics Netherlands recently released the Dutch person network mapping affiliations between individuals (van der Laan et al. 2022). This network contains five layers: family members, housemates, neighbors, classmates, and colleagues (see Bokányi, Heemskerk, and Takes 2023 for details on the topological properties of the network). In this replication, we focus on the family layer to investigate kinship relations among the entire Dutch population (17.2 million individuals), excluding 2.1 million first generation migrants to total 15.1 million individuals. We use the multilayer network library created by Bokányi, Kazmina, and de Jong (2023) for the analysis.

To generate the family layer, Statistics Netherlands used the full parent–child administrative register that started on January 1st, 1995. These parent–child connections were established either through birth (for mothers), through the recognition of the father, or by legal adoption. From the parent–child links, Statistics Netherlands derived other kin ties: co-parents, siblings, grandparents, aunts, uncles, cousins, nieces, nephews, and grandchildren (van der Laan 2022). Family members actively registered on October 1st, 2018 were retained in the 2018 network data along with their connections. A complete overview of definitions and linkages is presented in Appendix A.

This approach enables the observation of sibling relationships even if the parents are deceased, provided that the parent–child relationship was recorded at some point after January 1st 1995. The Swedish kinship data used by KAPD were digitized as early as the late 1960s (Kolk et al. 2023), resulting in greater coverage of parent–child links (further documentation in Appendix B). While in the Dutch data, paternal and maternal kin had to be distinguished by linking through the siblings of parents, in the Swedish data, cousins could be linked through a shared (deceased) grandparent.

Similar to the methodology employed by KAPD, our analytical sample focuses on egos; i.e., focal individuals and their alter family members. Since the kinship networks

of foreign-born egos consist of many untraceable relatives, KAPD selected egos born in Sweden. In the available data, the best available criterium was to exclude first generation migrants; that is, egos born abroad with at least one parent also born abroad (CBS 2023a). This implies that non-Dutch born individuals not registered as first-generation migrants remain in the data.

We calculate the average number of ego's grandchildren, children, nieces, nephews, siblings, cousins, parents, aunts, uncles, and grandparents, along with the proportional distribution of these kin. After a brief description of the overall similarities, we highlight key differences between Dutch and Swedish kinship networks. To facilitate comparison in the abundance of information, we select three reference points: individuals born in 1935, 1955, and 1985 in Sweden (OSM of KAPD), corresponding to individuals aged 83, 53, and 33 in the Netherlands on October 1st, 2018. These represent the pre-WW2-cohort, the baby boom cohort, and the post-SDT (Second Demographic Transition) cohort (Table 1). Replications of all figures presented by KAPD are available in Appendix C.

Table 1: Average number of kin by cohort reference in Sweden (SE) in 2017 (Kolk et al. 2023) and the Netherlands (NL) on October 1st 2018

	Cohort birth year (age)	SE (M/F)	NL (M/F)	Δ in % (M/F)
Grandchildren	1935 (83) – pre-WW2	3.6 / 3.9	3.8 / 4.1	+6% / +5%
Children	1935 (83) – pre-WW2	2.0 / 2.0	2.1 / 2.3	+5% / +15%
	1955 (63) – baby boom	1.9 / 2.0	1.8 / 1.8	–5% / –10%
Nieces/nephews	1955 (63) – baby boom	4.1	5.5	+34%
Siblings	1955 (63) – baby boom	1.9	2.7	+42%
	1985 (33) – post-SDT	2.2	1.8	–18%
Cousins	1985 (33) – post-SDT	8.1	11.2	+38%
Parents	1985 (33) – post-SDT	1.9	1.8	–5%
Aunts/uncles	1985 (33) – post-SDT	3.7	5.1	+38%
Grandparents	1985 (33) – post-SDT	1.0	0.6	–40%

Note: Δ in % = ((NL – SE)/SE) *100; M = Male; F = Female

3. Results

3.1 Overall similarities

At first sight, the figures produced for the Netherlands (see Appendix C) indicate that the average and proportional distributions of kin are similar to those in Sweden, despite the poorer coverage of parent–child links in The Netherlands (Appendix B). Table 1 compares the average number of kin across reference cohorts and shows similar results

(that is, less than 10% difference) for men's and women's number of grandchildren in the pre-WW2 cohort, for men's number of children in the pre-WW2 and the baby boom cohorts, and for men' and women's number of parents in the post-SDT cohort.

3.2 Fertility

Fertility among the Dutch pre-WW2 cohort of women (2.3) exceeded their Swedish counterparts (2.0). Figure 2 (Appendix C) shows that the proportion of Dutch women having four or more children is particularly large in the Netherlands (16% compared to 9% in Sweden). This difference can be attributed to a larger baby boom of pre-WW2 cohorts in the Netherlands (Human Fertility Database 2023), with a particularly high proportion of larger families in the so called 'Bible Belt' region (Sobotka and Adigüzel 2002).

Consequently, kin availability along horizontal (e.g., siblings) and vertical (e.g., nieces/nephews) lines is greater in the baby boom cohort: Swedish baby boomers have on average 1.9 siblings and 4.1 nieces and nephews, whereas the Dutch have 2.7 siblings (42% more) and 5.5 nieces and nephews (34% more). Differences in the average number of cousins are likely of a similar magnitude but cannot be directly compared because grandparents of individuals born in 1955 are often not observed in the registers after 1995.

This Dutch baby-boom effect trickles down to the younger generation. The post-SDT cohort in the Netherlands has a substantially higher number of aunts and uncles (5.1) and cousins (11.2) compared to Sweden (3.7 and 8.1), amounting to relative gaps of 38% in these average kin counts. The baby-boom effect fades out among the younger cohorts as Dutch fertility declines below the Swedish level. Lastly, the Dutch post-SDT cohort appears to have 40% fewer grandparents (0.6) than Sweden (1.0), but this difference can be largely explained by missing parent–child links in the data (see Appendix B).

3.3 Family complexity

Table 1 shows a reversal of sibling differences among the baby boom and post-SDT cohorts. While Dutch baby boomers have 42% more siblings than their Swedish counterparts, the Dutch post-SDT cohort has an 18% lower sibling average (1.8) than their Swedish counterparts (2.2). Figure 4 (Appendix C) and Figure 4 in KAPD show that this higher average in Sweden is explained by a greater number of half-siblings (see also Figure 2 in Appendix C). From the 1950s cohorts onward, the prevalence of half-siblings in Swedish families began to rise substantially (Turunen and Kolk 2017), a trend driven by a high divorce rate (2.8 in Sweden vs. 2.0 in the Netherlands in 2013 (Eurostat, 2024))

and subsequent multi-partner fertility (also see Lappegård and Thomson 2018). On average, the Dutch post-SDT cohort has 0.1 paternal half-siblings and fewer than 0.1 maternal half-siblings, compared to 0.4 paternal half-siblings and 0.3 maternal half-siblings in Sweden (not displayed in Table 1).

4. Conclusions

From our analysis of Dutch kinship network data and its comparison with KAPD's demographic account of kin numbers in Sweden, we draw three main conclusions. First, we find strong similarities, corroborating the picture that KAPD observed in the other demographically advanced Western context. Second, we identify periodic fertility differences trickling down from one generation to the next. Their consequences are evident in the higher numbers of aunts, uncles, and cousins among the post-SDT cohort born during the Dutch baby boom. This finding demonstrates how periodic differences such as a baby boom leave a lasting legacy in the demography of families, even if these differences are relatively short-lived. Third, differences in other demographic behaviors – specifically separation and divorce – play an important role in shaping the composition of kinship networks and cross-national differences (Lappegård and Thomson 2018). One clear consequence of cross-national differences in these behaviors is that Dutch families have notably fewer half-siblings than Swedish families. Future research should explore these dynamics over longer periods and in a wider array of cultural and demographic settings (Alburez-Gutierrez, Williams, and Caswell 2023).

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Appendices

Appendix A: Deriving kinship ties (based on CBS (2023b))

Because we could only distinguish paternal and maternal kin in the Dutch data by linking through the siblings of parents, we also calculated in how many cases the distinction between paternal and maternal kin could not be derived from the 2018 kinship network snapshot. In addition, paternal and maternal kin may overlap when one sibling couple partners another sibling couple and has children; i.e., so-called 'sibling set exchange' marriages (Bras, Van Poppel, and Mandemakers 2009). Children from these couples are double first cousins and they are also distinguished in the data. Lastly, in case of egos with same-sex parents, Kolk et al. (2023) only select the biological parent. This information is not registered in the data and these individuals are recorded as having two fathers (N = 300)[6] or two mothers (N = 9,300).

Grandchildren (POPNET linktype: 108)

- Grandchildren are the children of ego's children
- There are 13,214,100 raw dyads
- 1,422,600 dyads are dropped because ego is a first-generation migrant
- 600 dyads are dropped because the grandchild is older than or of a similar age to the grandparent
- Number of egos with at least one grandchild: 3,178,000
- Number of NA egos recoded to 0: 11,938,200
- Total population (excl. 2,141,000 first generation migrants): 15,116,200

Children (POPNET linktype: 107)

- Children are ego's children
- There are 19,160,800 raw dyads
- 2,738,800 dyads are dropped because ego is a first-generation migrant

[6] All numbers in this document are rounded to the nearest multiple of hundred.

- 300 dyads are dropped because the child is older than or similar to the age of the parent
- Number of egos with at least one child: 7,661,500
- Number of NA egos recoded to 0: 7,454,700
- Total population (excl. 2,141,000 first generation migrants): 15,116,200

Co-parents (POPNET linktype: 102)

- Co-parents are persons with whom ego has a child
- There are 8,034,700 raw dyads
- 1,051,800 dyads are dropped because ego is a first-generation migrant
- Number of egos having at least one co-parent: 6,765,800
- Number of NA egos recoded to 0: 8,350,300
- Total population (excl. 2,141,000 first generation migrants): 15,116,200
- The average number of children is made proportional to the distribution of co-parents (having 0, 1, 2, 3 or more co-parents)

Nieces/nephews (POPNET linktype: 106)

- Nieces/nephews are the children of ego's siblings
- There are 40,273,100 raw dyads
- 2,627,800 dyads are dropped because ego is a first-generation migrant
- The ID of ego's sibling (full, half, unknown; see 'siblings') is matched with the ID of alter's parent
- Unmatched niece/nephew: ego's sibling could not be matched with alter's parent (3,429,600 dyads)
- Number of egos having at least one niece/nephew: 7,386,900
- Number of egos recoded to 0: 7,729,300
- Total population (excl. 2,141,000 first generation migrants): 15,116,200

Siblings

- Full siblings (POPNET linktype: 103) are other children of both of ego's parents
- Half-siblings (POPNET linktype: 111) are other children of one of ego's parents
- Unknown siblings (POPNET linktype: 109) are other children of at least one of ego's parents, but it is unknown whether this child is also a child of ego's other parent
- There are 29,383,200 raw dyads
- 1,778,300 dyads are dropped because ego is a first-generation migrant
- The IDs of the ego's parent and the half-sibling's parent are matched to determine the gender of the shared parent
- Unmatched half-sibling: the ID of the ego's parent could not be matched with the ID of the half-sibling's parent (281,900 dyads)
- Number of egos having at least one sibling: 12,599,100
- Number of NA egos recoded to 0: 2,517,100
- Total population (excl. 2,141,000 first generation migrants): 15,116,200

Cousins (POPNET linktype: 105)

- Cousins are children of the siblings of ego's parents
- There are 87,521,600 raw dyads
- 836,300 dyads are dropped because ego is a first-generation migrant
- The ID of ego's parent is matched with the ID of the cousin's aunt/uncle. The gender of the parent determines whether the cousin is paternal or maternal.
- The ID of ego's aunt/uncle is matched with the ID of the cousin's parent. The gender of the parent determines whether it is a cousin from an aunt or uncle.
- When both of ego's parents are aunt and uncle of the cousin, they are double first cousins (155,700 dyads)
- Unmatched cousins: (1) The ID of ego's parent could not be matched with the ID of the cousin's aunt/uncle (i.e., paternal/maternal is unknown) or (2) the ID of ego's

aunt/uncle could not be matched with the ID of the cousin's parent (i.e., aunt/uncle is unknown) (17,552,400 dyads)
- Number of egos with at least one cousin: 9,003,500
- Number of NA egos recoded to 0: 6,112,700
- Total population (excl. 2,141,000 first generation migrants): 15,116,200

Parents (POPNET linktype: 104)

- Parents are parents of ego
- There are 19,160,800 raw dyads
- 842,200 dyads are dropped because ego is a first-generation migrant
- 300 dyads are dropped because the child is older than or of a similar age to the parent
- Number of egos with at least one parent: 10,417,400
- Number of NA egos recoded to 0: 4,698,800
- Total population (excl. 2,141,000 first generation migrants): 15,116,200

Aunts/uncles (POPNET linktype: 101)

- Aunts and uncles are the siblings of ego's parents
- There are 40,273,100 raw dyads
- 346,200 dyads are dropped because ego is a first-generation migrant
- The ID of ego's parent is matched with the ID of the aunt's/uncle's sibling. The gender of ego's parent determines whether it is a paternal or maternal aunt/uncle and the gender of the aunt/uncle determines whether it is an aunt or uncle.
- Unmatched aunt/uncle: the ID of ego's parent could not be matched with the ID of the aunt's/uncle's sibling (i.e., paternal/maternal is unknown) (1,691,000 uncle dyads and 1,858,200 aunt dyads)
- Number of egos with at least one aunt/uncle: 9,110,300
- Number of NA egos recoded to 0: 6,005,900

- Total population (excl. 2,141,000 first generation migrants): 15,116,200

***Grandparents* (POPNET linktype: 110)**

- Grandparents are the parents of ego's parents.
- There are 13,214,100 raw dyads
- 85,500 dyads are dropped because ego is a first-generation migrant
- 500 dyads are dropped because the grandchild is older than or of a similar age to the grandparent
- The ID of ego's parent is matched with the ID of the grandparent's child. The gender of the parent determines whether it is a paternal or maternal grandparent.
- Unmatched grandparents: the ID of ego's parent could not be matched with the ID of the grandparent's child (i.e., paternal/maternal is unknown) (79,700 grandfather dyads, 159,800 grandmother dyads)
- Number of egos with at least one grandparent: 5,374,600
- Number of NA egos recoded to 0: 9,741,600
- Total population (excl. 2,141,000 first generation migrants): 15,116,200

All kin

- Number of egos having at least one kin: 14,895,700
- Number of NA egos recoded to 0: 220,500
- Total population (excl. 2,141,000 first generation migrants): 15,116,200

Appendix B: Missing parent–child links

The Netherlands' digital administrative register was only established in 1995, making lower data coverage than in Sweden – where digitization began in the late 1960s – inevitable. Missing parent–child links from before 1995 potentially affect the average number of nieces/nephews and siblings for egos aged 63, because this requires ego's parents to be observed after 1995. Similarly, missing parent–child links from before 1995 potentially affect the average number of cousins, aunts/uncles, and grandparents for egos aged 33, because this requires ego's parents and ego's parents' parents to be observed after 1995.

First, following KAPD, we checked for missing parent–child links based on mother–child links. We calculated the percentage of missing mother–child links for each birth year. KAPD applied a 95% data coverage threshold; if more than 5% of the mother–child links were missing, the data were classified as 'less representative,' as indicated by dashed lines and paler areas in their graphs. Dutch parent–child links exceed the 95% data coverage threshold only for individuals aged 53 or under on October 1st 2018, corresponding to cohorts born in or after 1965.

Next, again following KAPD's approach, we examined three-generational links by identifying a grandmother on each parent's side. In the Dutch data this required linking mothers to the parents of individuals, which could only be done if the intermediate generation was still alive. As a result, three-generational coverage reached a maximum of 77%, falling short of the 95% threshold. Consequently, the figures illustrating the average numbers and proportions of cousins, aunts/uncles, and grandparents (see Appendix C) are entirely pale to indicate this limitation.

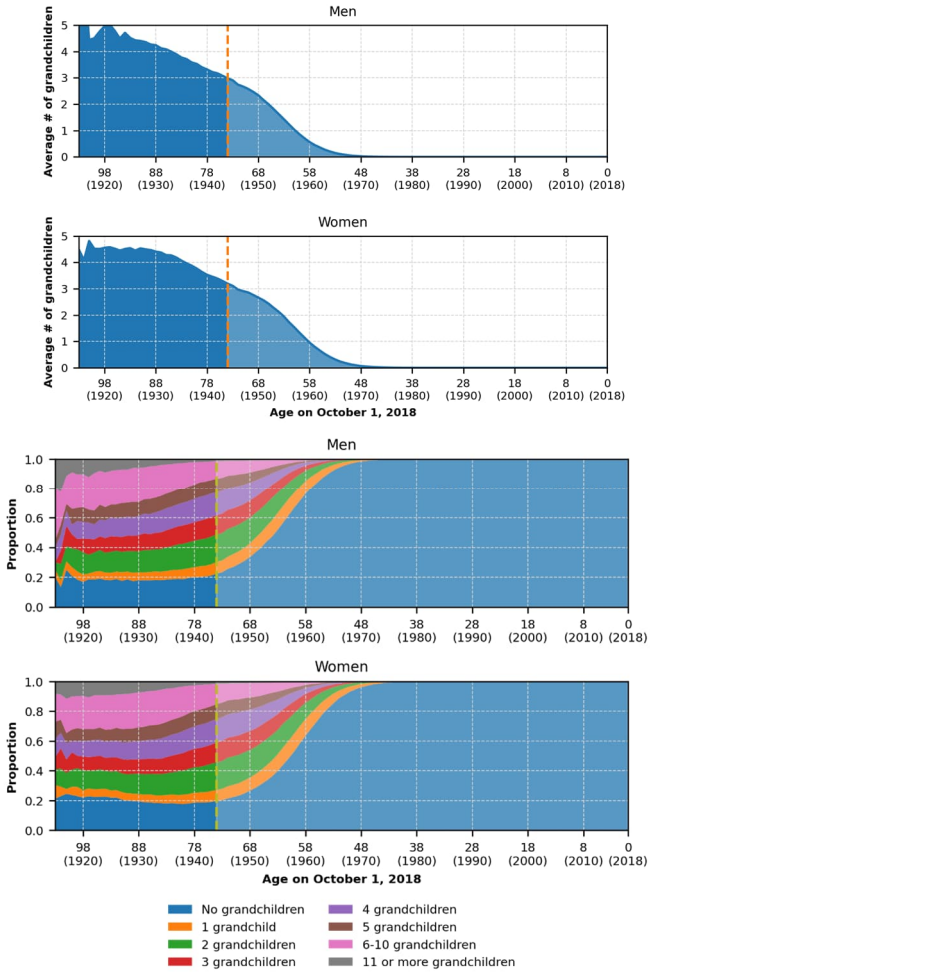
Although this represents a substantial difference compared to the Swedish data, we argue that this does not necessarily pose a significant problem. Given the scarcity of comparable data sources, any opportunity for comparison with Sweden is valuable, even if the Dutch data are somewhat less comprehensive. Moreover, our conclusions are based on Table 1, where we focus on three selected cohorts (1985, 1955, and 1935). For the first two cohorts, the percentage of missing mother–child links is 0.3% and 13%, respectively, and the percentage of missing grandmother–child links is 44% for the 1985 cohort. For the 1935 cohort we only calculated downward kin ties, which do not rely on mother–child links. The 13% missing mother–child links and 44% missing grandmother–child links are suboptimal, and to understand their implications we recalculated the average number of kin by excluding individuals with missing mother–child or grandmother–child links. The results, presented in Table 1, show that the mean numbers of kin are slightly higher when egos with missing parent–child links are excluded. Thus, the present analyses are conservative and may slightly underestimate the average number of kin.

Table A-1: Robustness check of average number of kin by cohort in the Netherlands (NL) on October 1st 2018. Cohort sizes are rounded to the nearest multiple of a hundred

		Table 1 (by age, excluding first-generation migrants)		Additionally excluding egos with missing parent–child links	
	Cohort birth year (age)	Mean	N	Mean	N
			189,900		165,200
Nieces/nephews	1955 (63) – baby boom	5.5		6.0	
			189,900		165,200
Siblings	1955 (63) – baby boom	2.7		2.9	
			165,900		92,900
Cousins	1985 (33) – post-SDT	11.2		13.2	
			165,900		92,900
Aunts/uncles	1985 (33) – post-SDT	5.1		6.0	
			165,900		92,900
Grandparents	1985 (33) – post-SDT	0.6		0.8	

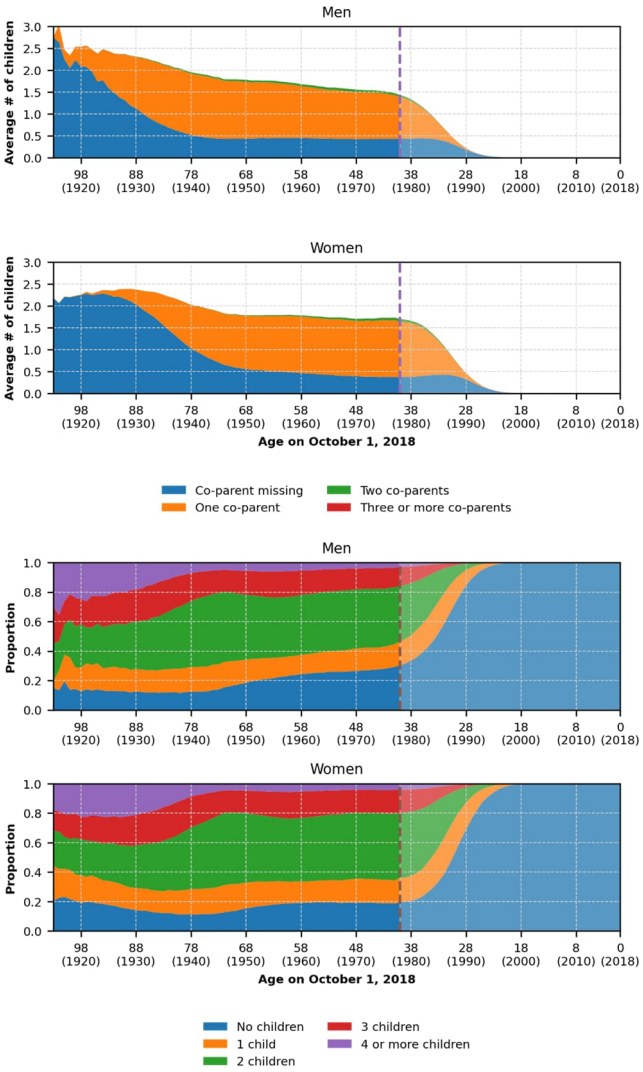
Appendix C: Full replication of Kolk et al. (2023)

Figure A-1: Average number of living grandchildren (top two panels) and proportional distribution of the number of living grandchildren (bottom two panels), by sex and age on October 1st, 2018: Dutch individuals, excluding first-generation migrants, aged 103–0 on October 1st, 2018



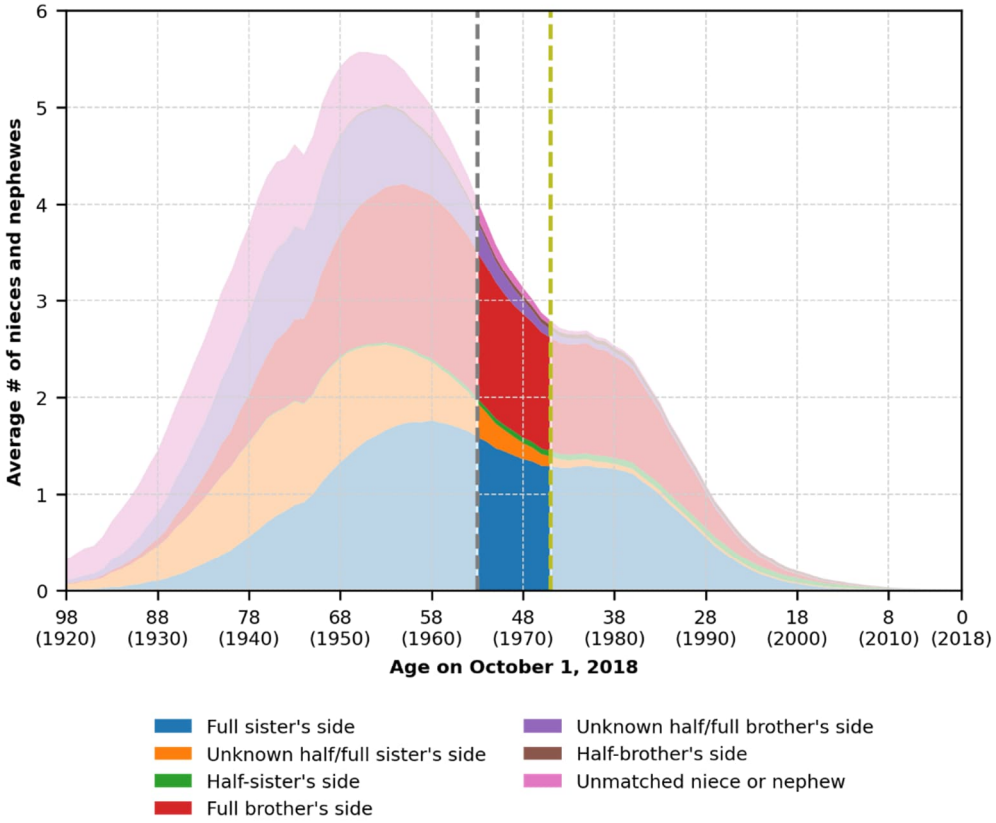
Note: The paler area on the right side of the dashed vertical line (age 74) indicates ages for which we are unlikely to observe the complete set of grandchildren because they were not yet born. Data underlying these figures are available in Appendix D.

Figure A-2: Average number of living children (top two panels) and proportional distribution of the number of living children (bottom two panels), by sex and age on October 1st, 2018: Dutch individuals, excluding first-generation migrants, aged 103–0 on October 1st, 2018



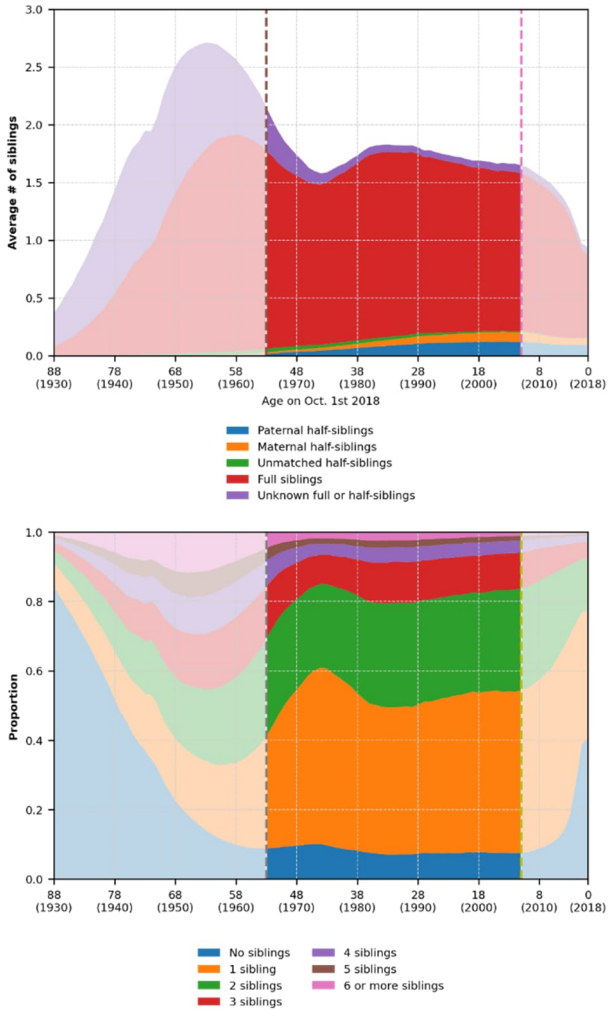
Note: The paler area on the right side of the dashed vertical line (age 40) indicates ages for which we are unlikely to observe the complete set of children because they were not yet born. Data underlying these figures are available in Appendix D.

Figure A-3: Average number of living nieces and nephews through full or half-sister/brother, by age on October 1st, 2018: Dutch individuals, excluding first-generation migrants, aged 98–0 on October 1st, 2018



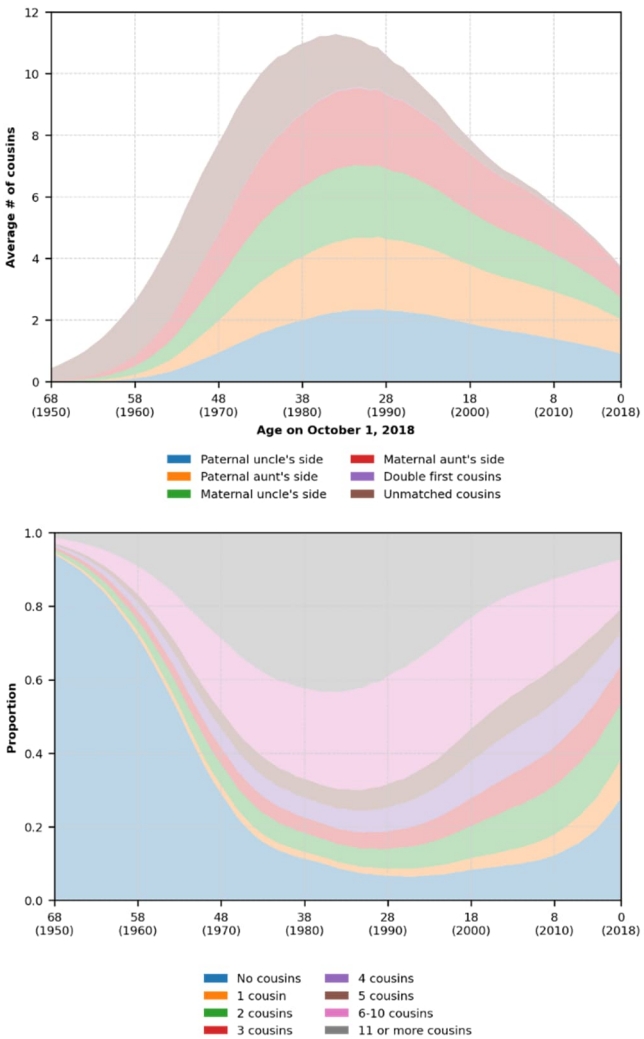
Note: The paler area on the right side of the dashed vertical line (age 45) indicates ages for which we are unlikely to observe the complete set of nieces and nephews because they were not yet born. The paler area on the left side of the dashed vertical line (age 53) indicates birth cohorts with incomplete coverage of siblings because of missing parent–child links. Data underlying this figure are available in Appendix D.

Figure A-4: Average number of living siblings and whether full- or half-sibling (top panel) and proportional distribution of the number of living full- and half-siblings (bottom panel), by age on October 1st, 2018: Dutch individuals, excluding first-generation migrants, aged 88–0 on October 1st, 2018



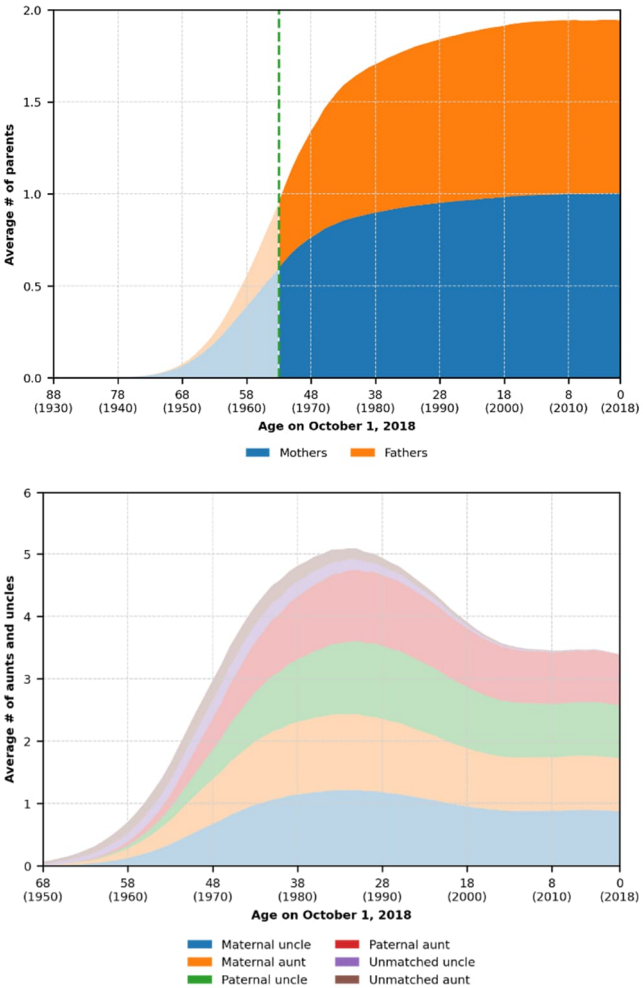
Note: The paler area on the right side of the dashed vertical line (age 11) indicates ages for which we are unlikely to observe the complete set of siblings because they were not yet born. The paler area on the left side of the dashed vertical line (age 53) indicates birth cohorts with incomplete coverage of siblings because of missing parent–child links. Data underlying these figures are available in Appendix D.

Figure A-5: Average number of living cousins by type of aunt or uncle (top panel) and proportional distribution of the number of cousins (bottom panel), by age on October 1st, 2018: Dutch individuals, excluding first-generation migrants, aged 68–0 on October 1st, 2018



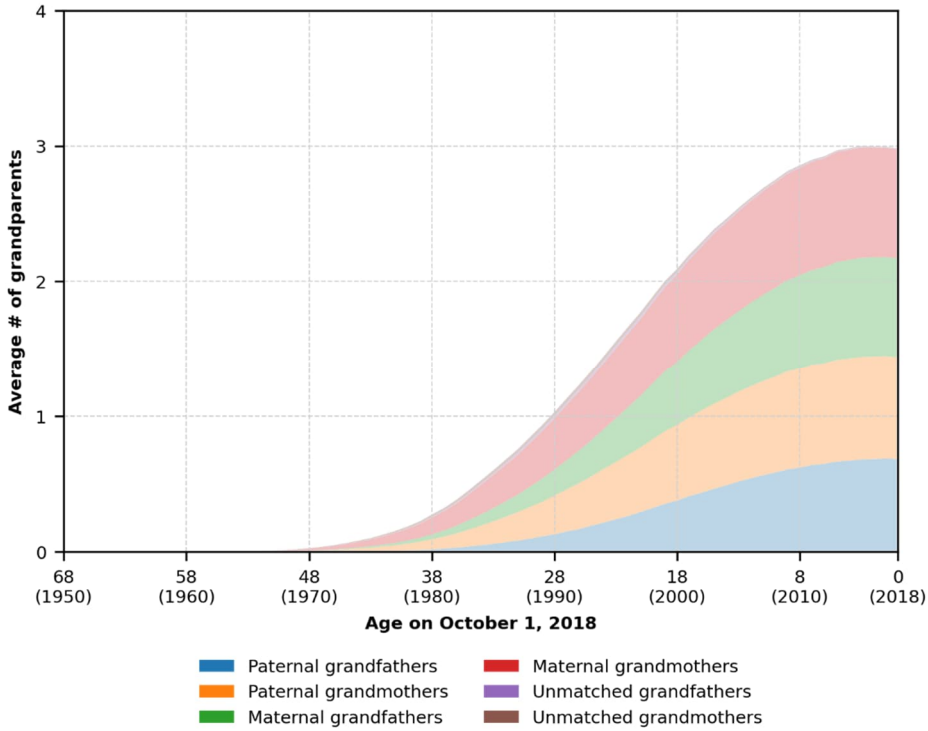
Note: The figure is paler because all cohorts that could potentially include a complete set of cousins have incomplete cousin coverage due to missing three-generational parent–child links (also see Appendix B). Data underlying these figures are available in Appendix D.

Figure A-6: Average number of living parents (top panel) and average number of living parents' siblings (aunts and uncles) (bottom panel), by age on October 1st, 2018: Dutch individuals, excluding first-generation migrants, aged 88–0 (parents) and 68–0 (aunts and uncles) on October 1st, 2018



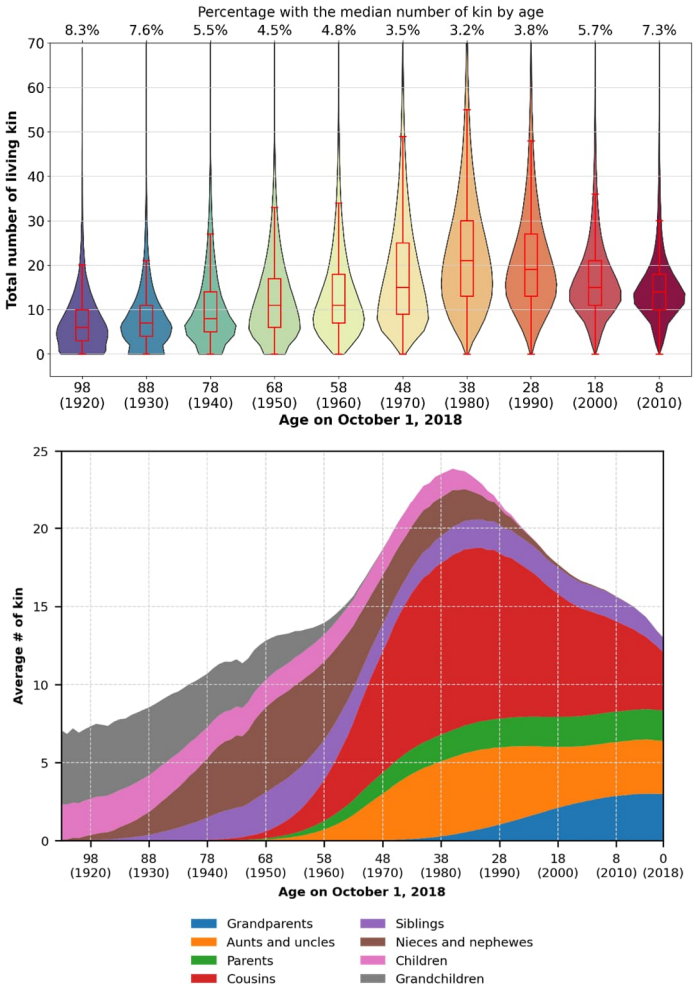
Note: The paler area on the left side of the dashed vertical line (age 53 for parents) indicates birth cohorts with incomplete coverage of parents because of missing parent–child links. The figure for aunts and uncles is paler because all cohorts that could potentially include a complete set of aunts and uncles have incomplete aunt/uncle coverage due to missing three-generational parent–child links (also see Appendix B). Data underlying these figures are available in Appendix D.

Figure A-7: Average number of living grandparents, by age on October 1st, 2018: Dutch individuals, excluding first-generation migrants, aged 68–0 on October 1st, 2018



Note: The figure is paler because all cohorts that could potentially include a complete set of grandparents have incomplete grandparent coverage due to missing three-generational parent–child links (also see Appendix B). Data underlying this figure is available in Appendix D.

Figure A-8: Distribution of the total number of living kin (top panel) and the average number of all types of kin (bottom panel), by age on October 1st, 2018: Dutch individuals, excluding first-generation migrants, aged exactly 98, 88, 78, …, 28, 18, 0 (top panel) and aged 103–0 (bottom panel) on October 1st, 2018



Note: In the top panel, following Kolk et al. (2023), box plots show quartiles and 5th and 95th percentiles; the top label indicates the percentage of the population with the exact median number of kin for that age (width of each curve). The figure is truncated at 70. The average number of kin for younger birth cohorts may be influenced because we are unlikely to observe the complete set of kin because they were not yet born. The average number of kin for older birth cohorts may be influenced by the lack of parent–child links. Data underlying the figure in the bottom panel is available in Appendix D.