Beyond the nuclear family:

New data on kinship networks reveal matrilineal tilts, ripple effects of divorce, and the importance of extended kin

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Abstract

This study analyzed kinship network data collected from adults aged 25 to 35 (N = 9,377 individuals; 163,117 dyads) in seven Western countries (Germany, Italy, Netherlands, Poland, Sweden, UK, US). These data – unprecedented in their coverage of ties to nuclear, extended, and complex kin – open a novel perspective on family and kinship as sources of influence, integration, and support. We report three main findings: First, extended kin are central to younger adults' lives, accounting for half of the family members they are emotionally close to, in regular contact with, and deem important. Second, kinship networks are matrilineally tilted. Maternal kin are emotionally closer, more frequently contacted, considered more important, and more reliable as a source of support. Third, parental separation permeates deeply into the family network, weakening ties particularly in the paternal line. Compensation of these losses through complex kin is limited in most countries but substantial in the US.

When considering what is most important in their lives and what gives their lives meaning, people consistently prioritize relationships with family and relatives above health, career, money, friends, faith, and home (Bowling 1995; Pew Research Center 2021). Integration into a kinship network is fundamental to the human condition and to human societies. Bilineal multi-group networks, encompassing immediate and extended kin from both maternal and paternal sides, are uniquely human and universal in human populations (Chapais 2008). The family network into which people are born and often remain embedded throughout their lives serves as a primary source of attachment, nurturance, and socialization in childhood, of social integration in adulthood, and of safety in times of crisis and need.

Despite this importance, research on family networks has been limited by the scarcity of available data. Traditional social science data tend to focus on the core or "nuclear" ties between parents and children, and the rise of the household survey has reinforced this narrow perspective on the family of residence (Furstenberg 2020). Other data sources offer information on specific types of kinship ties, such as grandparents, siblings, or step-relatives, but leave substantial portions of the surrounding family network unexplored. Genealogies and population registers offer extensive family tree data but lack insight into the nature of these relationships (Kaplanis et al. 2018).

In this study, we leverage newly collected cross-nationally comparative data that provide an unprecedented level of scope and detail in mapping social relationships in family networks. The KINMATRIX survey, conducted in 2022 and 2023, offers ego-centric networks of anchor respondents aged 25-35, encompassing their biological parents, grandparents, full siblings, paternal and maternal half-siblings, aunts, uncles, first-degree cousins, and step-relatives resulting from separation and re-partnering. The data provide comprehensive information about the relationships between anchor respondents and all of these kin embedded in their family networks.

While our coverage of family networks remains partial, these data surpass existing sources in terms of the number of included kin, encompassing multiple relatives along maternal and paternal lines. Moreover, these data extend beyond nuclear ties to cover extended lineal and collateral kin, both biological and complex. Such expanded coverage is vital because kinship ties beyond the nuclear family may serve as significant sources of socialization, status and behavior transmission, individual social integration, societal cohesion, and support in response to economic, emotional, and practical needs (Bengtson 2001, Alburez-Gutierrez et al. 2022). Extended family ties have been recognized in research on social stratification as conduits for the transmission and reproduction of inequality (Mare 2011, Jaeger 2012, Erola et al. 2018), and in research on social support as part of the protective cocoon or "latent kin matrix" that safeguards individuals throughout their life course (Antonucci et al. 2014, Riley 1983).

Therefore, these new data represent not just a larger segment of the family network but a closer fit with those family members and family relationships that matter to individuals. It addresses a gap between the empirics and the realities of family life that is particularly vast for people of lower socio-economic status in which extended kin may be crucial to individual and collective survival strategies (Stack 1974, Johnson 2000), drawing on a web of supportive relations that are activated in times of need. Although the notion of an oftentimes dormant supportive kinship matrix is decades old (Riley 1983), it remains insufficiently captured by extant narrow data on family relationships.

While previous studies have found that family tie strength weakens with genealogical distance (Rossi & Rossi 1990, Parsons 1943), social network research has highlighted the significance of weaker ties for individual outcomes and social cohesion (Granovetter 1973, Berkman & Syme 1979). A related argument distinguishes between relative and absolute perspectives on kin within the family network: A relative perspective comparing different

types of kinship dyads may reveal weaker ties to extended kin. But even if ties to, for example, aunts, uncles, and cousins are less intense than those to parents and siblings, extended kin offer more exposure in terms of a larger absolute number available and hence a substantial opportunity structure for social influence, interaction, and support. The comprehensive coverage of extended kin in the KINMATRIX data allows for a novel assessment of relative and absolute importance of kin within the family network.

By utilizing the KINMATRIX data, we present a fresh examination of nuclear and extended kinship ties within family networks and their structural configurations along kinship lines. The concept of the "postmodern family condition" (Stacey 1997) characterizes contemporary Western kinship as increasingly diverse and unstable – governed less by ascribed kinship norms and more by voluntary, flexible connections that are "earned," with rights and obligations often negotiated akin to friendships or neighborly relationships (Milardo 2010). This concept suggests that modern family networks are structurally vulnerable and potentially eroding, placing individuals at a higher risk of social isolation and reliance on public support.

Demographic trends that have reinforced this concern are rising union instability and family complexity (Lesthaeghe 2010). Divorce and separation not only disrupt a romantic union. They also disrupt a larger family network surrounding this union, undermining individual social integration and societal cohesion at a level and scope that previous data sources could not fully capture. At the same time, the surge in divorce and separation has increased the complexity of kinship ties, adding new kin that did not exist in traditional family networks. A view that is limited to biological relationships is increasingly out of step with the demographic realities of families, many of which are replete with complex relations created by remarriage, repartnering, and multi-partner fertility (Kalmijn et al. 2018, Thomson 2014). Accordingly, the disruptive effect of divorce and separation on family networks may be

compensated, at least partly, by step-kin and half-kin added on both paternal and maternal sides. The KINMATRIX survey aimed at a near-complete coverage of such complex kinship ties.

Additionally, the comparative design of the KINMATRIX survey contributes to the limited database on variation in family and kinship networks across Western societies (Furstenberg 2020). The family culture hypothesis (Reher 2004, Hajnal 1965, Wall et al. 1983) posits enduring differences in family norms as the foundation for cross-national variation in welfare regimes and social policies (Daatland et al. 2011). Countries in Northern Europe tend to exhibit looser family norms and more voluntaristic kinship ties along with less clearly assigned and less gendered kinkeeper roles. Liberal countries like the United States and the United Kingdom share an emphasis on self-reliance and acknowledge the limits of family responsibilities. Countries of Southern and Eastern Europe, in contrast, are characterized by "strong family systems" where family norms tend to be stricter and rooted in a religious culture that emphasizes collective identities of families, traditional values, and women's kinkeeper roles (Javornik 2014, Leitner 2003).

Studies on intergenerational solidarity between parents and adult children have documented a North-South gradient across Europe whereby family integration is least intense in the Northern Europe, more intense in central Western Europe, and most intense in Southern Europe (Albertini et al. 2007, Hank, 2007, Kalmijn & Saraceno, 2008). Comparative assessments of family solidarity in Europe and beyond have predominantly focused on close kinship ties (Silverstein et al. 2010, Dykstra & Fokkema 2011), although the cultural, economic, and institutional factors underlying cross-national differences suggest that systematic variation found in closer family ties may extend to larger kinship networks. Moreover, strong family systems with highly gendered kinkeeper roles may exhibit a stronger matrilineal tilt whereby family ties are closer and networks more cohesive along the maternal

line. KINMATRIX data have been collected in ten countries, allowing initial empirical insight into these hypotheses.

In this study, we present first results from the KINMATRIX survey, drawing on younger adults (ages 25–35) as anchor respondents and examining their family networks in three domains: (1) a retrospective view of their family networks as loci of socialization, support, transmission, and influence; (2) a present-day view of their family networks sources of current social integration; and (3) a prospective view of their family networks as safety nets in future times of need. Within each domain, we explore the importance of nuclear, extended, and complex kin, and we examine variation between maternal and parental lines, between "intact" and separated families, between relative and absolute perspectives, and across countries.

Results

Family networks in retrospect: Who was important?

Figure 2 shows the results for respondent evaluations of who was important in their lives. From a relative perspective on dyadic importance, shown in panel (a), we observe a consistent hierarchy by genealogical distance in all countries. This hierarchy is characterized by a primacy of nuclear kin and of grandparents among extended kin, followed by aunts, uncles, and cousins. With the exception of siblings, this hierarchy of importance is gendered, with maternal and female relatives being consistently rated as more important than paternal and male relatives. The importance attributed to extended kin is significantly higher in the maternal line, with the most sizable kinship line contrasts observed in grandmothers and aunts.

Figure 2 here

Panel (b) of Figure 2 examines the relationship between family structure and kin importance. It shows that parental separation is associated with a reduced importance of fathers. For other nuclear kin (mothers and siblings), most estimates are negative but do not reach conventional thresholds of statistical significance. Similarly, the associations between parental separation and extended kin importance tend to be weak and statistically insignificant, with the exception of paternal grandparents for whom negative associations were found in several countries. The only kin type revealing predominantly positive albeit insignificant associations with parental separation is maternal grandmothers. Overall, the tilt towards higher matrilineal importance among extended kin, as observed in panel (a) of Figure 2, appears to be only weakly related to parental separation.

Panel (c – I) of Figure 2 presents kin importance from an absolute perspective. The bars indicate that although extended kin have lower relative probabilities of being rated as important, their larger numbers compensate for this. As a result, extended kin contribute an equal or even slightly larger share than nuclear kin to the total number of kin deemed as important in respondents' lives. For instance, US respondents considered an average of approximately six kin as important, with more than three of these coming from the extended family.

Panel (c – II) of Figure 2 compares kin importance by family structure. This analysis shows fewer important kin among respondents from separated families. However, this disparity is absent in Sweden and moderate in size in the remaining countries (approximately one kin or 20% less). The inclusion of complex kin rated as important partially closes this gap, most notably in the US. In Sweden, young adults from separated families even report slightly higher numbers of kin deemed as important.

Family networks in the present: Who is close and who is in contact?

Figures 3 and 4 show the results for respondent evaluations of current frequency of contact and emotional closeness to kin. From a relative perspective on dyadic contact and closeness, presented in panels (a), we observe a primacy of mothers in all countries, followed by fathers, sisters, and brothers. Contact and closeness to extended kin decline with genealogical distance; among extended kin, levels observed for living grandparents are consistently higher than those observed for aunts, uncles, and cousins. Current contact and especially closeness with kin are clearly gendered: levels are higher for female than for male kin, and especially when comparing maternal to paternal lines of extended kin. This matrilineal tilt in contact and closeness to kin is almost universal across all kin types in all countries examined.

In cross-country comparison, levels of contact and closeness and variation across kinship types and kinship lines are more notable for their similarity than for differences. The exception is Italy, representing Southern-European kinship patterns and showing more frequent contact to extended kin and emotionally closer relations to nuclear kin as well as to extended kin.

Figure 3 here

Figure 4 here

Panels (b) of Figures 3 and 4 examine the relationship between family structure and kin contact and closeness, respectively. These panels show that parental separation is associated with reduced contact and closeness with nuclear as well as extended kin. Different from what was observed for retrospective evaluations of kin importance, the associations between parental separation and current contact and closeness to extended kin are often sizeable and statistically significant. Moreover, this widespread erosion of current integration with kin is stronger on the paternal side, suggesting that parental separation is a driver of the

overall tilt towards higher matrilineal contact and closeness observed in the panels (a) of Figures 3 and 4.

Panels (c – I) of Figures 3 and 4 present kin contact and kin closeness from an absolute perspective. Similar to what was observed for kin importance, the relevance of extended kin for current contact and closeness increases from an absolute perspective. Yet, nuclear kin still contribute larger shares than extended kin to the total number of kin to whom younger adults are in regular contact and feel close. Panels (c – II) of Figure 3 and 4 compare these quantities by family structure. This analysis provides an additional quantification of how strongly current social integration with kin erodes for respondents from separated families. Disparities by family structure are largest in term of closeness and emerge as a combined consequence of reductions in nuclear and extended kin. For example, Dutch respondents whose parents never separated feel close to an average of approximately four biological kin; for those whose parents separated, this number is cut in half. In other countries, the contrast is smaller but remains sizable. Again, complex kin partially close this gap. This compensation is limited in most countries but more substantial in Sweden in especially in the US.

Family networks in prospect: Who can be counted on?

Figure 5 shows the results for our measure of the family safety net: Who could respondents really count on if they needed help, today or in the future? From a relative perspective on dyadic probabilities shown in panel (a), we observe a consistent hierarchy by genealogical distance, a dominance of nuclear kin, and small differences between countries. Gender and kin line differences are similar to other outcomes, with female and maternal kin more often featuring in respondents' prospective safety nets,.

Figure 5 here

Panel (c) of Figure 5 examines differences by family structure, showing that parental separation is associated with a weakened nuclear safety net. In several countries, parental separation is also associated with a diminished representation of paternal grandfathers in the family safety net. The associations with parental separation tend to be weaker and more often statistically insignificant than previously observed for measures of current social integration. Overall, parental separation appears to undermine mainly the nuclear part of the family safety net.

Panel (c – I) of Figure 5 presents the prospective family safety net from an absolute perspective. The bars align across countries indicating that younger adults can count on an average of approximately 2.5 to 3 biological family members for support, whereby nuclear kin outweigh extended kin by a ratio of approximately 3 to 1. Panel (c – II) of Figure 5 compares these estimates by family structure. This analysis reveals a smaller safety net among respondents from separated families – a shrinkage of approximately one-third in most countries. This shrinkage is primarily associated with reductions in nuclear kin. The resulting disparities remain substantial even after considering potential compensation by complex kin.

Detailed descriptive and regression results on which the figures shown in this section are based can be accessed in the online supplement (Appendix 1 and Appendix 3).

Discussion

This study analyzed newly collected KINMATRIX data that provide an unprecedented level of scope and detail about social relationships in family networks. Our data surpass existing data sources in the coverage of ties to nuclear, extended, and complex kin. This comprehensive coverage permits a novel assessment of (i) the family as a source of influence, integration, and support; (ii) the relative and absolute importance of kin for these outcomes;

(iii) how kinship line structures family life in contemporary Western societies; and (iv) how demographic shifts – in particular the rise of divorce and separation – have disrupted biological family relationships beyond the dissolving marital tie, introducing new complexities in family networks.

This study presents the initial findings from the KINMATRIX survey, which focused on examining the family networks of younger adults aged 25 to 35. Our investigation covered retrospective views on the importance of kin, current views of social integration with kin, and prospective views of kin as a safety net.

A central finding of our study is that extended kin matter far more than what data and empirical research have previously suggested. Our results corroborate long-standing and recent calls to bridge the gap between the actual lived experiences of families and how these families are represented in empirical studies (Daly 2003), to improve knowledge on relationships to extended collateral kin (Milardo 2010), and to address the lack of comparative data on the scope of interactions in kinship networks (Furstenberg 2020).

Although the importance of kin for the domains we examined followed a well-known hierarchy based on genealogical distance (Parsons 1943, Rossi & Rossi 1990), our comprehensive coverage of kin allowed us to go beyond this relative hierarchy and establish an absolute assessment. This assessment recognizes that in most families, extended kin vastly outnumber nuclear kin (Alburez-Gutierrez et al., in press). Looking at retrospective evaluations of kin importance, our absolute assessment demonstrates that extended biological kin played a crucial role in shaping the lives of young adults. Approximately half of the family members deemed important in their lives were grandparents, aunts, uncles, or cousins. This substantial representation of extended biological kin supports broader accounts of social transmission and influence, underscoring the significance of relational resources beyond the parent-child relationship in shaping human behavior and status attainment (Mare 2011, Jaeger

2012). It is widely acknowledged that relevant resources reside not only in the core but also in the periphery of the family network. However, identification of their effects has proved difficult (Lundberg 2020). Despite such challenges, our results suggest that continued research into extended kin as a source of socialization and as a resource for status attainment will remain fruitful. Comprehensive data, considering the "strength in numbers" of extended kin, are vital to gain a complete perspective on their role in shaping family dynamics and individual outcomes.

Moving from this retrospective view to a current perspective on the lives of younger adults, our results further demonstrate how extended biological kin matter for social integration. A considerable number and proportion of individuals who maintain regular contact with and are emotionally close to young adults come from the extended part of their family networks. Consequently, extended kin can be regarded as a protective factor against social isolation, loneliness, and the associated adverse mental and physical health outcomes (Erzen & Çikrikci 2018, Cacioppo et al. 2002). This includes not only extended kin from older generations but also cousins – a kin type that has been historically underappreciated in data and research, primarily being acknowledged for shared genes and attribute correlations (Hällsten 2014, Pfeffer 2014) rather than the relational qualities they possess. Ties to cousins that are not only abundant but constitute, next to siblings, the most durable of all kinship relations.

While the significance of extended kin was evident in both retrospective and current perspectives, their role appeared to be less prominent when considering a prospective view of kin as a safety net. Our analysis of whom people could genuinely count on in times of need revealed a latent supportive matrix that was predominantly composed of nuclear kin. This suggests that a higher intensity of current social interactions with kin does not necessarily

imply stronger norms of support and obligation. For instance, Italy's exceptional levels of current social integration with extended kin did not translate into a larger family safety net.

In addition to these general conclusions regarding the importance of nuclear and extended kin in the examined relational outcomes, we found notable variation based on kinship line and family structure. First, matrilineal tilts were evident across all outcomes. Maternal kin were more often identified as important, more frequently contacted, emotionally closer, and overrepresented among those who could be counted on. These matrilineal tilts were consistent across all countries studied and often substantial in magnitude, emphasizing the critical role of kinship line in contemporary Western families. Existing data on family relations often conceal this role, as evidenced by the use of catch-all categories for "aunts and uncles" or "other relatives" even in surveys that aim to capture wider kinship (Goebel et al. 2019, Sapin et al. 2017).

Family network data that match or even exceed the KINMATRIX survey analyzed here will allow future investigations to examine the factors underlying matrilineal tilts. Potential explanations include female kinkeeping roles (Rosenthal 1985), greater tie strength among women and especially between sisters (Cicirelli 2013), and the rise of divorce and separation (Clark & Kenney 2010, Raley & Sweeney 2020, Mortelmans 2020). Even if kinkeeper roles are becoming less female-typed and more inclusive of men, the rise of family instability constitutes a countervailing force strengthening kinship line contrasts in family networks. Considering differences between kinship lines and their interplay with other gendered patterns of relations between family members, we posit that Western kinship is distinctly, and perhaps increasingly, female-oriented. This orientation manifests in a higher influence of the maternal line, more intense interactions among women, and a stronger role of women in governing and facilitating family networks.

Second, our comparison between "intact" and separated families illustrates the far-reaching disruptive effects of parental separation on family networks, particularly within the paternal line. These disruptions reveal how actions taken by individuals within the family network can produce consequences that extend to seemingly remote areas, often overlooked in conventional quantitative data. For young adults who have experienced parental separation, this event can be disruptive at multiple levels: not only affecting their relationships with parents, the cohesion within their nuclear family, their well-being and educational careers, but also impacting their access to resources from extended kin and their integration with aunts, uncles, cousins, and grandparents – especially on the paternal side. Our data further indicate that some of these relational losses are compensated for by the arrival of complex kin such as step-parents, step-siblings, and half-siblings. This compensation appears to be limited in most countries but more substantial in the United States. The United States stand out as a society with relatively high levels of marital instability and high levels of multi-partner fertility (Guzzo 2014, Thomson et al. 2020), contributing to the prevalence of complex family structures and number of complex kin that may partially offset the losses experienced through parental separation.

Our comparison of nuclear and extended family networks across Western societies revealed more cross-national similarities than differences. All conclusions drawn from our study were supported in each of the seven countries examined. These countries exhibited broad similarities in terms of hierarchies across kinship types in the outcomes assessed, as well as in comparisons based on kinship line and family structure. Italy stood out for higher current social integration with nuclear and especially with extended kin. Although this finding is consistent with Italy's reputation as a "strong family system" (Reher 1998), it did not translate into a larger family safety net, wherein nuclear kin are surrounded by a broader protective cocoon of extended kin.

Looking ahead, our research paves the way for future investigation of kinship networks in cross-national comparison. Across the countries included in this study, economic, cultural, and institutional differences are relatively small when considering the diversity of kinship worldwide. Building on the foundations laid by the KINMATRIX survey, an important objective is to expand the collection of comparative family network data. By embracing a global perspective on kinship networks, this expansion involves not only adding new samples and countries from Europe and North America but also countries from Africa, Asia, and South America.

Methods

Collecting family network data

KINMATRIX data were collected from December 2022 until March 2023 using large-scale quota samples recruited in Denmark, Finland, Germany, Italy, the Netherlands, Norway, Poland, Sweden, the United Kingdom, and the United States. In a web-based survey, each anchor respondent (*ego*) created a personal (ego-centric) family network and reported on various relations to and attributes of members (*alters*) in this network. Anchor respondents were selected from an age range of 25 to 35 using sampling quotas on sex, age, education level, and region. These age boundaries represent a bottom-up perspective anchoring family networks in a generation of younger adults and spanning their family trees laterally and vertically to adult kin from the same or older generations.

Alters. The coverage of family members defined as alters does not abandon the nuclear view, but enlarges the perspective by integrating nuclear, extended, and complex kin. Specifically, the set of alters was defined as individuals related to anchor respondents by biological descent and affinity, comprising kin up to a degree of four: biological parents; all

full siblings and half-siblings; all grandparents, aunts, uncles, and first-grade cousins; and all step-kin defined as partners of each biological parent and these partners' children for all parent-partner unions lasting at least two years.

Network boundaries. These boundaries of the family network satisfied feasibility criteria regarding survey duration, respondent burden, and respondent knowledge (Perry et al. 2018). Such nominalist boundaries (Wasserman & Faust 1994) contrast with realist boundaries which allow respondents to define their "own" family network based on individual perceptions of kinship, including biological kin but also fictive kin such as close friends who are viewed as family (Widmer 2016). The advantages of the nominalist approach include consistent definitions of kinship independent of anchor perception and hence allowing consistent aggregation across family networks, coverage of intact as well as loose or broken ties, and alignment with external data sources for validation.

Survey design. Figure 1 illustrates core elements of the KINMATRIX survey. The online supplement includes a full documentation of questionnaires, programming, web design, respondent look-and-feel, sampling, and translation procedures. After completing a set of personal questions, the web-survey instrument asked anchor respondents to create their family trees using name generators about several types of kinship relations. Their family trees grew as respondents moved through the survey. After each section, respondents could view and if necessary revise their updated family trees. Family tree data were collected in the following order: biological parents, full siblings, paternal grandparents, paternal uncles and aunts, paternal cousins, maternal grandparents, maternal uncles and aunts, maternal cousins, father's partners, paternal half- and step-siblings, mother's partners, and maternal half- and step-siblings. Half-siblings were recorded regardless if born before or after the start of the parental union from which the anchor respondents descended. Parents' partners from unions formed after the parental union had ended (by death or separation) were recorded only if these

partners had lived with the parent for at least two years (Kalmijn et al. 2018). Parents' partners from unions formed before the parental union were recorded only if a half-sibling was born into this union. Step-siblings were defined as children that a recorded partner brought into a union with a biological parent.

Figure 1 here

For each category of alters except biological parents and grandparents, respondents initially reported their number to define the size of the matrix for subsequent data entries. For each alter, respondents reported names, dead-alive status, and if applicable additional retrospective information about family structure (e.g., occurrence and timing of separation, duration of co-residence). Follow-up questions were used if a number (e.g., the number of children of a paternal uncle) was unknown. Additionally, respondents could specify names, dead-alive status, and other characteristics as unknown during the collection of family tree data. The family tree section resulted in a roster of names, with kinship relations to each name displayed to respondents in parentheses. This roster was imported into subsequent questions about relations to and attributes of alters using different response entry formats designed to minimize nonresponse and response bias (see Figure 1 and Appendix 1). To ensure cross-national equivalence of measures, the project was guided by the five-step process of translation, review, adjudication, pretest, and documentation (TRAPD, Davidov et al. 2014, Harkness 2005).

Sampling and data quality

All country samples were recruited by an access panel provider using hard sampling quotas for age and sex and soft sampling quotas for education level (low, medium, high) and region. Quotas were calculated from official statistics for the year of the survey (see Appendix 2 in the online supplement for details). Because not all quotas were met, post-stratification weights

were used to weight the samples to align with official statistics on the respective reference populations aged 25 to 35.

Data quality of the web-based survey benefitted from the focus on a young target group of anchor respondents (Dillman & Smyth 2007, Kaplowitz et al. 2004, Shih & Fan 2008). Despite this benefit, quality issues remained in the raw data, notably response problems related to task difficulty (large numbers of alters and kinship types; recollection issues), confidentiality and sensitive topics (real names, intimate relations, death), and strong satisficing (survey speeding, straightlining, and excessive don't knows). These issues were addressed by several quality checks that removed invalid data either during the survey or in the course of cleaning the raw data. Cleaning procedures were based on validity checks focusing especially on reported knowledge about numbers, names, and dead-alive statuses of alters (see the survey documentation in the online supplement for details).

After cleaning, a scientific use file was obtained that is scheduled for release to the scientific community in 2024. Data in this file were validated by comparisons with various benchmarks calculated from several probability-based surveys (European Social Survey, European Values Study, International Social Survey Programme, German Socio-Economic Panel Survey, German Family Panel, US General Social Survey). Selected benchmarking results are presented in Appendix 2. In several of the countries studied, the KINMATRIX samples closely matched external benchmark data for the number of siblings, living parents and grandparents, the probability of grandparental separation, and relational characteristics such as contact frequency and emotional closeness to nuclear kin. Response bias and selectively issues that remained after cleaning suggested that the KINMATIX data tend to underestimate the number of uncles and aunts (and by implication, cousins). Moreover, KINMATRIX respondents showed higher average levels of parental education and were slightly less healthy and satisfied with their lives compared to their counterparts from external benchmark surveys.

Relational measures

Measures for relations to alters in the family network covered retrospective, current, and prospective assessments of respondents' ties to members of their family network. The present study used four relational measures. The *retrospective* domain was captured by the following survey question: "If you think about the role of these persons in your life up to now: Who was important to you?" Anchor respondents answered by selecting names from the roster of alters displayed in full, including all names regardless of whether the alter was dead or alive. This measure represented a global assessment encompassing the entire life course preceding the interview. It was deliberately open to respondents' own definitions of "important."

The *current* domain was captured by two questions about emotional closeness and frequency of contact. The first question "How close do you feel emotionally to each of these persons today?" had five answer categories (Very close, Pretty close, Somewhat close, Not too close, Not at all close) of which the highest two were collapsed into a binary indicator for pretty or very close relations. The second question "How often are you in contact with each of these persons, adding up all visits, letters, phone calls, etc.?" had six answer categories (Daily or several times per week, Once per week, 1-3 times per month, Several times per year, Less often, Never) of which the highest three were collapsed into a binary indicator for at least monthly contact. Anchor respondents answered both questions separately for each living alter displayed in a carousel format (see Figure 1). These two questions on closeness and contact represent standard measures for affective and associational solidarity from the widely-used solidarity model for family integration in its various aspects (Bengtson & Roberts 1991). Both measures are pertinent indicators for intimacy and interaction, selected from a larger set of questions capturing these and other dimensions of the solidarity model (e.g., support, conflict, spatial distance) and dichotomized for ease of interpretation, presentation, and comparability between measures used across domains.

The *prospective* domain was captured by the following survey question: "Who could you really count on if you needed help, today or in the future?" Anchor respondents answered by selecting names from the roster of living alters. This measure represented a global assessment of the family network as a safety net. The verb "count on" invoked trusting ties and was intensified by the adverb "really" to prime respondents into selecting alters whom they could fully rely on for immediate and unconditional help. The purpose of this measure was to uncover the "latent kin matrix" surrounding individuals as a dormant web of supportive relations that can be activated in times of need (Riley 1983).

Analyzing differences within and between family networks

For each relational measure, we studied not only variance across kinship ties but also between kinship lines, relative and absolute perspectives, family structure, and countries. For the binary indicator of *kinship line*, all alters except full siblings were assigned to paternal or maternal lines based on biological descent or, for complex kin, based on re-partnering, re-marriage or step relations to anchor respondents' fathers or mothers, respectively. For all relational measures, *relative estimates* represented each type of kinship tie as an ego-alter dyad conditional on presence of an alter and regardless of their number. For example, a relative estimate of the probability of having a close or very close relationship to maternal aunts represented an average over all dyads of this kinship type. *Absolute estimates* were obtained by multiplying these relative estimates with the total number of kin reported for each type of kinship tie. For said example, an absolute estimate would represent the expected total number of maternal aunts to whom anchor respondents had a close or very close relationship.

The analysis of differences by *family structure* was designed to incorporate both relative and absolute perspectives. For a relative assessment of differences by family structure in relations to kin, we used linear probability models (i.e., OLS models for binary outcome

variables) regressing each relational measure on a binary indicator for family structure interacted with a measure for kinship type and controlled for a set of potential confounders.

The family structure indicator was defined as "intact" if anchor respondents' parents were still together at the time of the interview or had not separated before death (of at least one parent); it was defined as "separated" if anchor respondents' parents were no longer together at the time of the interview (if both were alive) or had separated before death (of at least one parent). Control variables included age, sex, education (in three categories), the living status of parents (both alive, father deceased, mother deceased, both deceased), the number of anchor respondents' own children, life satisfaction, self-rated health, grandparental separation (paternal and maternal), and flag variables for unknown names, numbers, and dead-alive statuses of kin. All relative assessments are presented as marginal effects obtained from these models as differences in the probabilities of affirmative answers to each outcome (in percentage-points), holding controls constant. For an absolute assessment of differences by family structure in relations to kin, we compared weighted means between two groups of anchor respondents' family structures ("intact" vs. "separated").

For the present study, we selected seven countries in which the number of anchor respondents exceeded 300: Germany, Italy, the Netherlands, Norway, Poland, Sweden, the United Kingdom, and the United States. Case numbers of anchor respondents in these samples varied between 350 in Sweden and 2,577 in the United States. The total *N* of anchor respondents used in the analysis was 9,377 and the total *N* of ego-alter dyads was up to 163,117. All analyses were conducted separately by country.

Table 1 here

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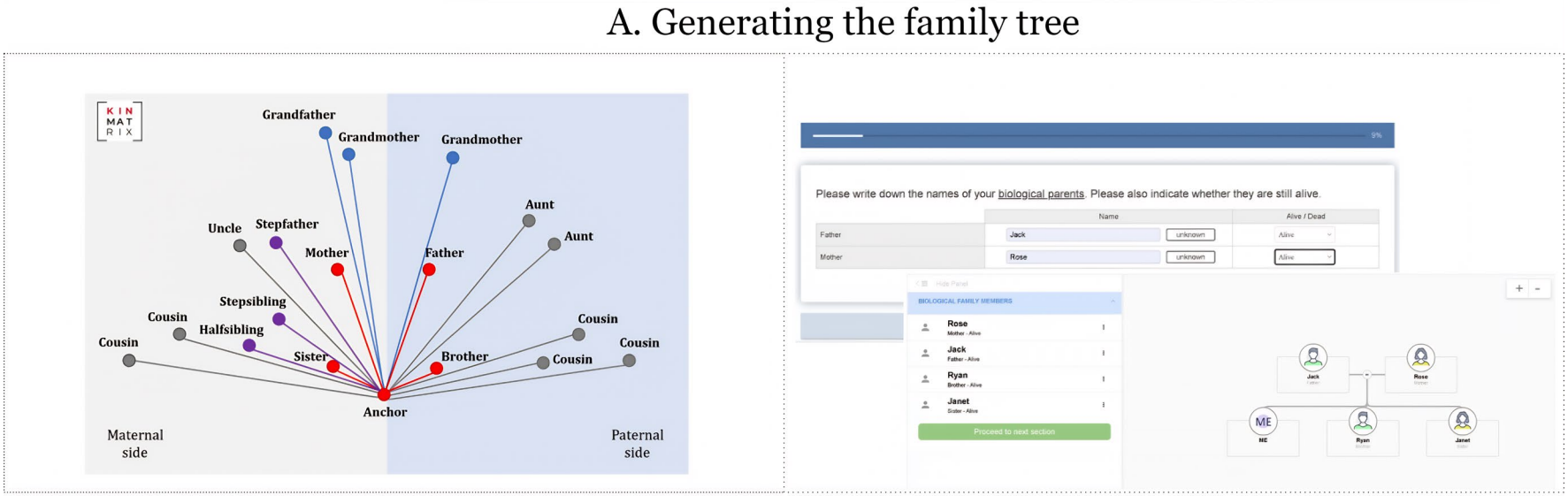

Figure 1. Web-based data collection in the KINMATRIX survey

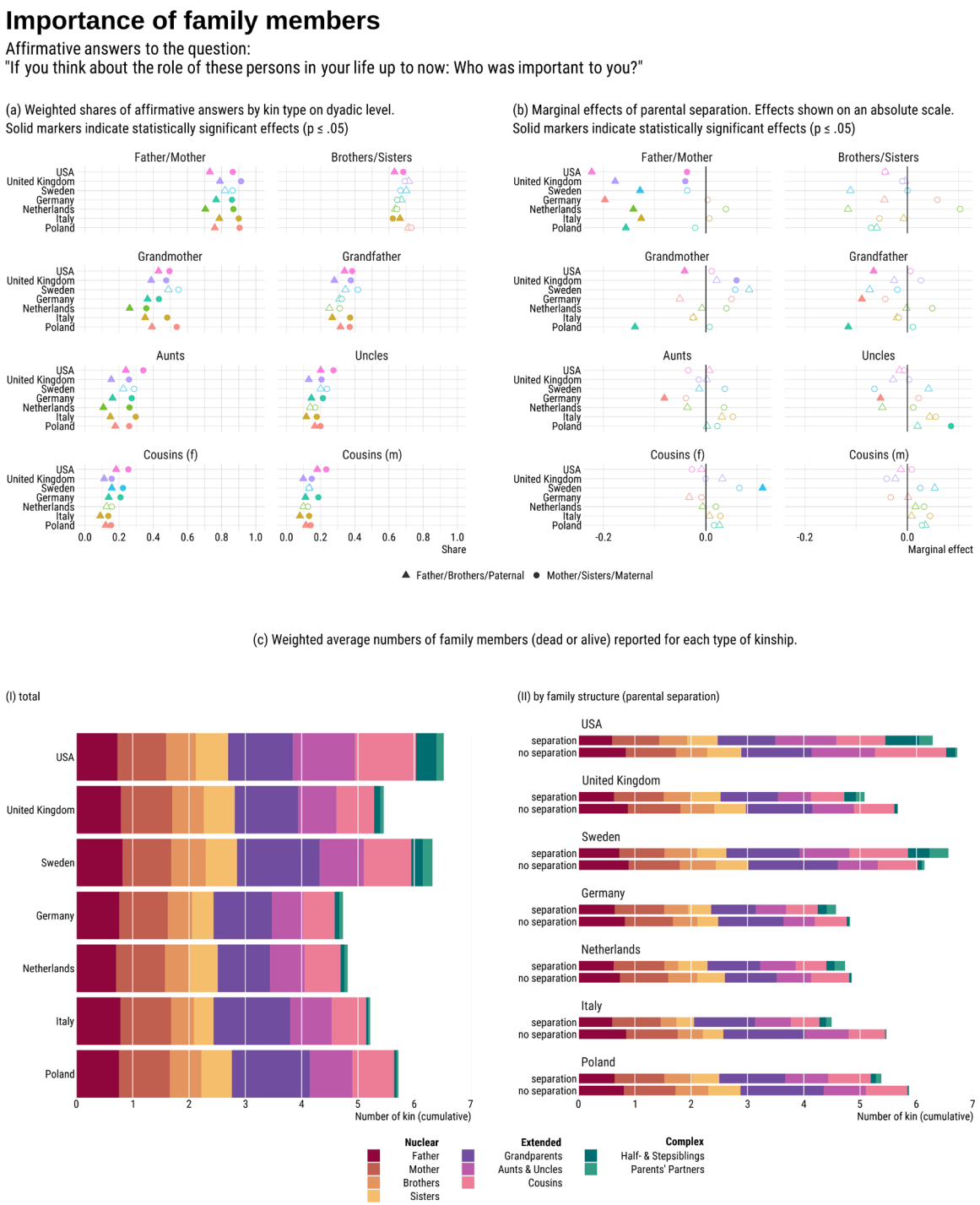

Figure 2. Importance of family members

Figure 3. Closeness to family members

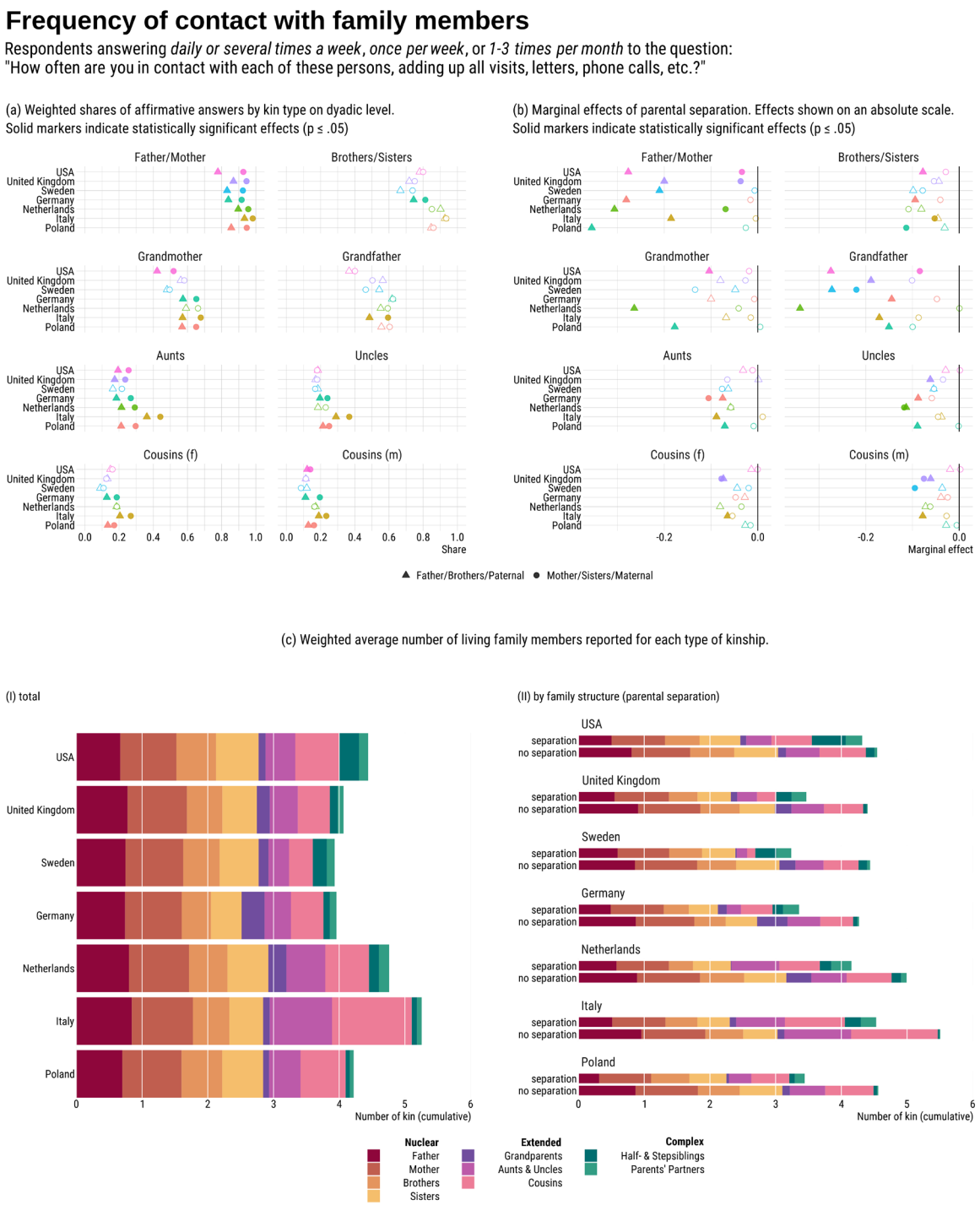

Figure 4. Contact to family members

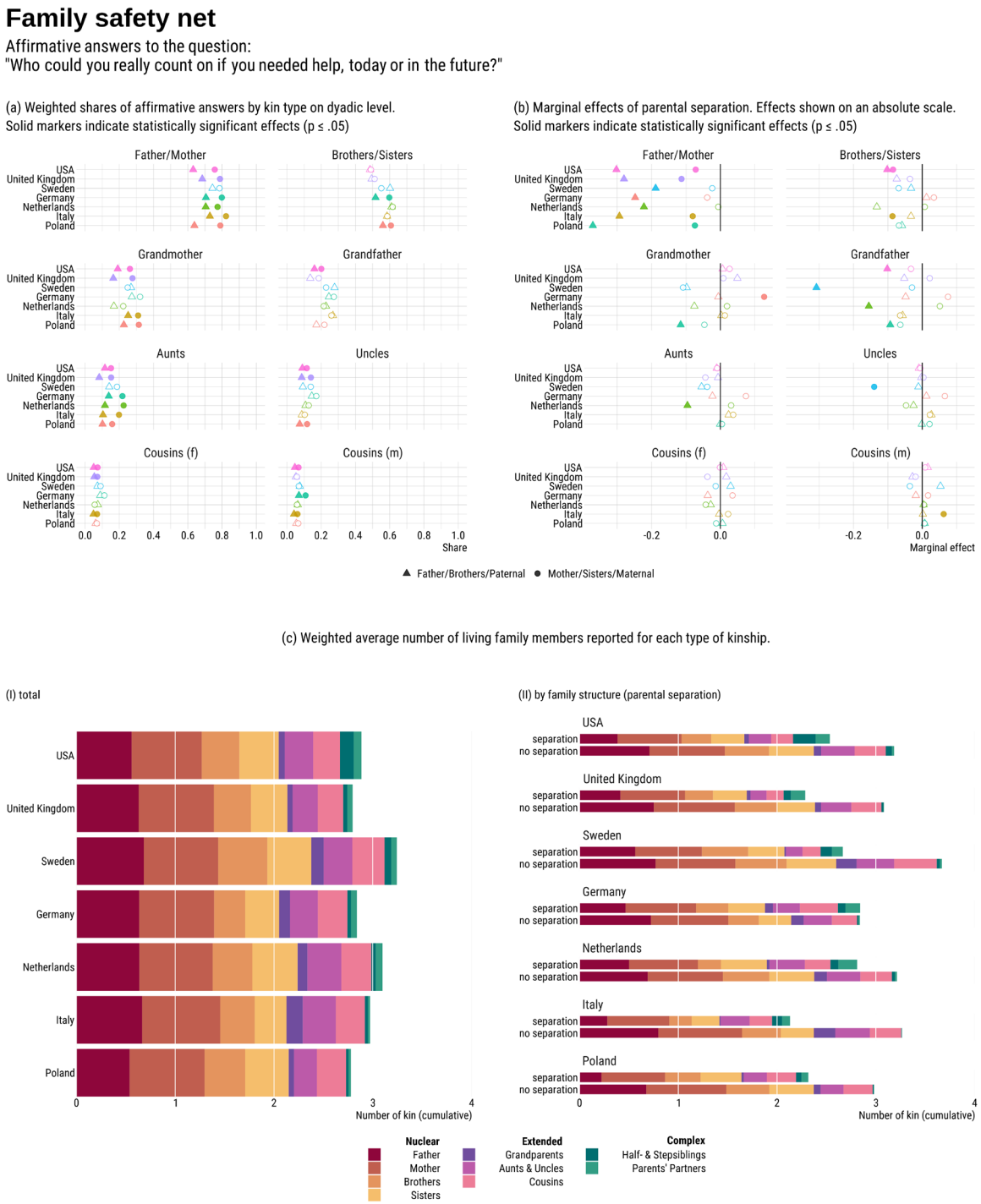

Figure 5. Family safety net

Table 1 – Descriptive statistics on respondent-level variables

	Poland	Italy	Netherlands	Germany	Sweden	UK	USA
Age	30.3 (3.1)	30.4 (3)	30 (3.4)	30.2 (3.2)	30.1 (3.1)	30.4 (3.1)	30.3 (3.2)
Female	49.2%	49.0%	49.3%	48.3%	48.6%	49.4%	49.2%
Race (US only)							
White							66.4%
Asian							19.8%
Black							8.9%
Other/no answer							4.9%
Level of education							
Low	6.2%	22.7%	10.7%	13.2%	16.0%	12.2%	6.0%
Mid	51.4%	48.6%	37.3%	51.9%	35.1%	30.4%	42.9%
High	42.5%	28.8%	52.0%	35.0%	48.9%	57.4%	51.1%
Number of children	0.8 (1)	0.3 (0.7)	0.7 (1)	0.5 (0.8)	0.4 (0.7)	0.7 (1)	0.9 (1.2)
Status of parents							
Both alive	78.7%	87.7%	85.9%	84.7%	86.2%	86.6%	81.1%
Mother dead, father alive	3.1%	3.1%	3.5%	4.1%	3.6%	3.1%	4.9%
Father dead, mother alive	16.6%	7.1%	9.5%	9.4%	8.8%	9.1%	11.2%
Both dead	1.6%	2.1%	1.1%	1.9%	1.3%	1.2%	2.9%
Separation of parents	30.5%	25.8%	28.6%	34.3%	42.3%	35.9%	46.1%
Separation of paternal grandparents							
No	84.1%	94.4%	83.1%	77.0%	68.4%	78.8%	63.6%
Yes	7.3%	3.4%	14.0%	16.5%	24.6%	16.4%	27.4%
Don't know	8.6%	2.2%	2.8%	6.5%	7.0%	4.8%	9.0%
Separation of maternal grandparents							
No	84.7%	90.8%	78.7%	78.5%	73.9%	76.0%	64.6%
Yes	8.7%	6.9%	16.7%	16.6%	21.2%	20.9%	27.7%
Don't know	6.6%	2.3%	4.5%	4.9%	4.9%	3.1%	7.7%
Number of reported kin	19 (9.2)	18.9 (9.4)	19.5 (9.9)	16.3 (8.9)	19.5 (10.3)	20.5 (11.1)	23.8 (13.2)
Life satisfaction (0-10 scale)	6.7 (2.1)	6.3 (2.1)	7.3 (1.7)	6.6 (2.4)	6.5 (2.3)	6.4 (2.3)	6.5 (2.4)
Self-rated health							
Very good	13.1%	19.7%	22.0%	19.7%	19.0%	20.8%	19.7%
Good	54.0%	55.6%	53.9%	47.2%	47.5%	48.5%	47.3%
Fair	27.9%	21.1%	22.0%	25.7%	22.6%	25.2%	28.6%
Bad	4.6%	3.4%	2.0%	7.3%	9.4%	5.0%	4.1%
Very bad	0.5%	0.2%	0.1%	0.2%	1.6%	0.4%	0.4%
Flagged[a]	7.5%	5.3%	11.3%	12.1%	10.2%	9.7%	12.9%
N (anchor respondents)	1,700	1,890	392	1,187	350	1,281	2,577

Weighted means and standard deviations (in parentheses) are shown for metric indicators. Weighted relative frequencies are shown for categorical variables. [a]Uncertain data validity on at least one key variable.