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Who are my people? Strengths and limitations of ego-centered network analysis: A case illustration from the Family tiMes survey

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Summary

This article examines the potential of using ego-centered networks with a case illustration drawn from the Swiss survey Family Trajectories and Social Networks: A Configurational Perspective of the Life Course (Family tiMes). It addresses the strengths and limitations of ego-centered network analysis based on name generators by using personal networks of individuals living in Switzerland composed of alters perceived as "very important." In the first section, we put ego-centered networks into perspective with regard to other types of networks, different generators to collect them, frequent biases associated to them and their utilization in Swiss studies. In the second section, three issues are briefly explored: the composition of personal networks to assess what types of ties are especially important for individuals, the tendency toward educational homophily, and the exchanges of emotional support occurring among network members. We show how to create a typology of personal networks, measure educational homophily, compute network structure indicators, and integrate them into regressions.

Keywords: network analysis, ego-centered networks, name generator, Switzerland

Who are my people? Strengths and limitations of ego-centered network analysis: A case illustration from the Family tiMes survey

Gaëlle Aeby[1]

1. Introduction

Over the life course, individuals engage in relationships with other individuals in the various contexts of sociability they experience, individuals who are themselves connected to other individuals. When a relationship flourishes, individuals are likely to meet the people directly connected to this person—relatives, friends, colleagues, etc.—and some of them will in turn become a direct connection. In addition, through family transitions and events (e.g., birth, partnership, separation, parenthood, death), ties are made available or disappear. This means that individuals' sociability is entirely embedded in webs of interlocking relationships. Furthermore, relationships are important because they may give access to resources of various kinds—material and immaterial, instrumental and emotional—broadly conceptualized as social capital. Besides economic and cultural capitals, resources embedded in personal relationships are key to understanding individuals' socioeconomic position in contemporary societies. The proverb "*Tell me who your friends are and I will tell you who you are*" brings up another important issue related to relationships: Individuals tend to develop ties with people sharing similar interests and who, therefore, may have characteristics in common with them, thus reinforcing social inequalities in societies. In light of the ongoing transformation of personal life and of the remaining existence of social stratification of Swiss society at the beginning of the 21st century, it is necessary more than ever to investigate individuals' personal networks to understand their complex sociability and their consequences in terms of social integration.

Personal networks, or ego-centered networks, start from the standpoint of one specific person (the *ego*) and analyze who s/he is connected to (the *alters*) and with what consequences. Personal networks are used to study a wide array of issues mainly related to personal life and social

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resources beyond geographical or organizational boundaries set by complete networks of a community or a firm, for instance. Questions can be asked about the types of ties present in the network (for instance, kin or non-kin), ties to people with specific roles, the characteristics of the network members, daily contacts or frequent interactions, various kinds of resources provided by network members, etc. Furthermore, this ego-centered perspective allows investigation of the determinants of personal networks as well as the consequences of personal networks on various social and behavioral outcomes. Thus, network analysis offers the opportunity to think about relations among individuals and the chance to go beyond individualistic approaches to society. It also facilitates getting closer to individuals' own definition of their personal life. Nevertheless, adopting a network approach raises a number of epistemic and practical challenges. This paper aims to discuss the strengths and limitations of ego-centered network analysis based on name generators by providing a concrete case illustration of personal networks of individuals living in Switzerland composed of alters perceived as "very important." For demonstration purposes, we will briefly explore three issues. First, we will explore the composition of personal networks to assess what types of ties are especially important for individuals. Second, we will assess the tendency toward educational homophily in personal networks. Third, we will investigate the exchanges of emotional support occurring among network members.

This paper is divided into two main sections, one devoted to the theoretical and methodological issues raised by network analysis in general and one to the application of ego-centered network analysis with a case illustration. In the first section, we introduce the increasing importance of network analysis and distinguish ego-centered networks from other types of networks. We discuss how to generate ego-centered networks comparing position, resource, and name generators, and we point out some frequent biases related to network data collection. Finally, we review a few ego-centered studies using name generators conducted in the Swiss context. In the second section, we briefly answer our three research questions by using two sets of measures, one related to network composition and one related to network structure, based on data stemming from the Swiss survey Family Trajectories and Social Networks: A Configurational Perspective of the Life Course (Family tiMes). We show how to create a typology of personal networks, measure educational homophily, compute network structure indicators, and integrate them into regressions.

2. Theoretical and methodological issues

2.1. **Personal networks: a window into personal life and social resources**

Along with other perspectives, such as the life course perspective, the network approach brings a more relational thinking to the social sciences (Elias, 1978, 1983; Emirbayer, 1997). Individuals are not seen as independent isolated units but rather as interdependent and interconnected. An individual action only makes sense when related to other individual actions influencing its course. Two disciplinary areas are accountable for the development in networking thinking: social network analysis and social anthropology (Knox, Savage, & Harvey, 2006). Social network analysis has emerged as a counter to more individualistic approaches.

Thinking in terms of relations is fruitful for the understanding of at least two topics related to personal networks: personal life and social resources. First, it informs the types of ties that matter, as well as the characteristics they hold. There is an ongoing debate about the importance of kinship ties in comparison with that of non-kinship ties in personal networks. As personal life is being affected by many transformations in Switzerland as well as in Europe (e.g., increase in divorces, rise of cohabiting unions, augmentation of births outside wedlock, pluralization of family forms; Kapella, Rille-Pfeiffer, Rupp, & Schneider, 2010; Widmer, 2010), relationships have become more flexible and voluntary based (Beck & Beck-Gernsheim, 1995; Giddens, 1991, 1992), which has led to the growing importance of friendship (Pahl & Spencer, 2004). In line with the so-called process of individualization, the boundaries between kin and non-kin regarding their roles and functions have been questioned (Allan, 2008; Pahl & Spencer, 2004; Wall & Gouveia, 2014). Nevertheless, the ties that matter the most often stem from the family context, and family appears to remain the prime source of solidarity in most cases (Bonvalet & Ogg, 2007). Individuals develop relationships through their social participation, and therefore, as society is vertically stratified, the development of relationships is constrained. Individuals tend to get closer to individuals sharing the same characteristics, such as ethnicity (or race), sex, age, religion, education, and occupation, a mechanism known as *homophily*, which leads to homogeneous networks (Marsden, 1988; McPherson, Smith-Lovin, & Cook, 2001). Since some of those characteristics are associated with resource availability and socioeconomic position, investigating the ties that matter also informs social stratification and social inequalities in contemporary societies, as we discuss further below.

Second, considering relationships recognizes the presence of resources embedded in social relations. Those resources are various—for instance, information, influence, status, emotional comfort, and instrumental support. Those resources have been conceptualized as *social capital*. Bourdieu (1986) conceptualized social capital as the resources stemming from the possession of a durable social network of mutual acquaintance or recognition. This definition puts the emphasis

on the benefits accruing to individuals by virtue of their ties with others. Social capital embedded in networks of personal relationships also depends on the network's structure or, in other words, on the presence or absence of relationships between network members. Some networks are densely connected; in those networks, most if not all individuals are interconnected (Coleman, 1988). Other networks are loosely connected, and weaker connections between subgroups of a network create relational holes in the structure that provide some persons (*brokers*) with opportunities to mediate the flow of exchanges and play a gatekeeper role (Burt, 1995, 2002). Those two contrasted network structures have their advantages—such as support and closeness for the former, power and autonomy for the latter—and drawbacks—such as closure and control for the former, high amount of time and energy spent for the latter. Those two different relational structures also have implications for the social capital that is being developed. Social capital stemming from the network structure has been conceptualized as twofold, *bonding* and *bridging* social capitals, by scientists inspired by the network approach (Burt, 1995, 2002; Coleman, 1988; Granovetter, 1973; Widmer, 2006, 2010).[2] Densely connected networks have been shown to favor the development of bonding social capital, while centralized networks favor the development of bridging social capital (Aeby, Widmer, & Carlo, 2014; Widmer, 2010).

2.2. Personal networks in contrast with complete networks: two ways of looking at society

Social network analysis can be applied to many types of networks. Researchers commonly distinguish two main types: *complete or whole* networks and *personal or ego-centered* networks. Complete or whole networks refer to networks delimited geographically or organizationally by a common activity. They are sometimes called *sociometric* or *sociocentric*. Many studies have used this holistic approach to study a wide array of topics, such as law firms (Lazega, 2001), Swiss elites (Bühlmann, David, & Mach, 2012), historical elites in Italy (Padgett & Ansell, 1993), and adolescent romantic and sexual networks in a midsize town in the United States (Bearman, Moody, & Stovel, 2002). It is a revealing way to understand underlying processes and group dynamics (e.g., leadership, prestige, power, influence). Nevertheless, this approach has two drawbacks, a methodological one and a theoretical one. At the methodological level, such a study design implies exhaustivity and is therefore time-consuming and costly. It is necessary to define and characterize all persons included in a given network and to document all existing ties. At the theoretical level, it assumes that the phenomenon under scrutiny is best understood within the network boundaries. However, individuals have a multifocal social participation, and their relationships extend far beyond one geographic area or one specific activity. Wellman (1999) has

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[2]This distinction between bonding and bridging social capitals is different from that suggested by Putnam (2000), who distinguished between two forms of social capital: bonding (or *exclusive*) capital, which is more inward looking and has a tendency to reinforce exclusive identities and homogeneous groups, and bridging (*inclusive*) capital, which is more outward looking and encompasses people from different groups.

even suggested using the concept of *person-to-person networked individualism* to emphasize that individuals have become the primary units of connectivity (see also Wellman & Hogan, 2006). Therefore, the second approach starts from the standpoint of focal persons and studies personal or ego-centered networks. These are also sometimes called *egocentric*. Usually, a random sample of several personal networks composed of an ego in the center and her/his alters are studied together based on the assumption of independence between the distinct personal networks. There have been several major surveys using ego-centered networks, such as the General Social Survey (GSS) initiated in the United States (Davis, Smith, & Marsden, 2009), the Survey of Health, Aging, and Retirement in Europe (SHARE), the personal communities of East Yorkers in Canada (Wellman, 1999, 2007), and the Measures and Sociological Observation of Attitudes in Switzerland (MOSAiCH)[3]. Ego-centered networks have several advantages. For example, they do not assume predefined boundaries, and they account for individual sociability and various ways of connecting. In addition, it is possible to turn ego-centered networks into small sociometric networks by asking the respondents (the egos) to report on the ties among their network members (the alters). They also have drawbacks—in particular, the fact that the collection of the network relies on the perception of only one person. Finally, it should be noted that there are other network-inspired approaches such as the study of relational chains, which reconstructs the mobilizations of social relations in processes for accessing resources or networking with people (Grossetti, Barthe, & Chauvac, 2011; Lee, 1969; Travers & Milgram, 1969).

2.3. Types of network generators: the place of resources

Ego-centered networks need to be generated by questions referred to as network generators. There are several types of network generators, and consequently, the choice of the right network generator depends on the research question. The choice of network generator further constrains the types of analysis. The three most common types of generators are presented here: position, resource, and name generators.[4]

Position generator. The position generator has been extensively used to collect access-type social capital, as it measures access through network members' occupations (i.e., range of accessed prestige, highest accessed prestige, and number of different positions accessed) in hierarchically stratified societies (Lin, 1999; Lin, Fu, & Hsung, 2001). The main idea it to list a number of occupations (positions), and respondents have to indicate whether they know someone working in them; accessibility to a wide array of diverse positions is related to a high social position. Two limits should be noted. First, there is little specific information about social

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[3]The MOSAiCH is a national survey funded by the Swiss National Science Foundation that aims at capturing the attitudes and behaviors of the Swiss population toward political and social institutions as well as toward current social themes, as defined by the International Social Survey Programme (ISSP).
[4]There are other types of generators as well, such as event-related generators.

resources, and second, some social capital questions, in particular when related to expressive actions, cannot be translated into occupational prestige (Van Der Gaag & Snijders, 2005).

Resource generator. The resource generator was introduced by Van Der Gaag and Snijders (2005). This generator asks about access to a fixed list of resources representing a subcollection of social capital covering several domains of life. The availability of each of these resources is checked by measuring the tie strength through which the resources are accessed, indicated by the role of these ties (e.g., family members, friends, or acquaintances) (Van Der Gaag & Snijders, 2005). The list of resources comprises resources such as having persons from whom to borrow money, seek help for finding a job, etc. Concerning limits, the resource generator may overestimate the presence of resources because the question "knowing someone who..." remains diffuse and because of the social desirability to show one has connections in society. Distinguishing the potential availability and the concrete use of resources may help in overcoming this limit.

Name generator. The name generator consists of generating a list of persons linked to the respondent. Based on this initial list, it generally includes a few questions about the relationship (e.g., frequency of contact, duration) and the alters, including who they are and what their characteristics are (network composition). It also encompasses questions about the relations among alters (network structure). There is an ongoing debate between the possibility of generalizing from a single name generator to personal networks more broadly and the necessity of using multiple name generators together (Fischer, 1982; Marin & Hampton, 2007). Two of the most widely used name generators ("who are the people with whom you discuss matters important to you" and "who are the people you really enjoy socializing with") were found quite reliable, even if on some dimensions using multiple name generators proved to be better (Marin & Hampton, 2007). Name generators have been widely used (McCallister & Fischer, 1978). However, according to some scholars, the name generator is unsatisfactory for measuring social capital because of the burden associated with data collection, the noncomparability of findings, the redundancy (many alters giving access to the same resources), the variety of nonstandardized measures of social capital, and the focus on the structure of the social relationships rather than the resources (Van Der Gaag & Snijders, 2005). Despite these limits, the name generator is very useful because of this very focus on the structure of the social relationships. Thus, we can recreate the structure of the network and treat it as a sociometric network (similar to complete networks). It should be noted that some studies using name generators only focus on the network composition and, by doing so, fail to get sociometric networks and to measure structural interdependencies.

2.4. Name generator and network composition: setting boundaries

The choice of the name generator has different implications, as it delimits the list of potential alters. The literature has extensively discussed the effects of name generators on collected data (Campbell & Lee, 1991; Marin, 2004; Marsden, 2011). Here, we review five types of name generators: discussion partners, family members, known people, close people, and important people.[5]

Discussion partners. The name generator based on discussion partners refers to the people with whom respondents discuss important matters. It was developed by Burt (1984) and implemented in the 1985, 2004, and 2010 GSS in the United States (Marsden, 1987; McPherson, Smith-Lovin, & Brashears, 2006), as well as in other countries, including in the Swiss survey MOSAiCH. The opening question is: "From time to time, most people discuss important matters with other people. Looking back over the last six months, who are the people with whom you discussed matters important to you?"

Family members. Other studies take the opposite stand and ask for specific types of relationships (role-relation approach). Many scholars are interested in family networks, as family is often considered the primary source of solidarity (Bonvalet & Ortalda, 2007; Kempeneers & Van Pevenage, 2011; Lelièvre & Vivier, 2001). The Family Network Method (FNM) is a useful instrument to systematically collect such family networks (Widmer, Aeby, & Sapin, 2013; Widmer & La Farga, 2000). Respondents are asked to provide a list of all individuals whom they consider to be important family members in their life during the past year.

Known people. Some studies adopt a broad perspective and include all people respondents may know (interaction approach). The number of meaningful ties has been shown to reach 300 for the average North American (McCarty, Killworth, Bernard, Johnsen, & Shelley, 2001). However, most studies ask for fewer people. An application called EgoNet has been developed to collect large ego-centered networks; the requested number of alters is around 30 (Lozares Colina et al., 2011; McCarty, Molina, Aguilar, & Rota, 2007).

Close people. It is also possible to specify the quality of the relationship, for instance, closeness (affective approach). Some researchers have used a system of concentric circles to measure the degree of closeness with a method known as the *Antonnucci social network circle* (Phillipson, Bernard, Phillips, & Ogg, 2007). Respondents are invited to generate a list of close people and to distinguish different degrees of closeness by placing these people on a map made up of a series of concentric circles, the closest persons being located in the first circle.

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[5]There are other derived name generators, such as the contextual name generator, which draws up an exhaustive list of people known by respondents in each sociability context (Bidart & Charbonneau, 2011).

Important people. Finally, there is another, often-used name generator based on important people. This name generator has the advantage of not restricting the list to a single matter and letting respondents evaluate what "important" means to them. We used this last name generator in the Family tiMes survey and present it in more detail shortly.

To sum up, the choice of the best instrument (type of generator and, if applicable, type of name generator) completely depends on the aims of the study. Multiple designs combining different types of indicators may be a good solution when time allows. Thus, this means that the instruments have to be carefully adapted to meet the research aims and to approach specific populations and contexts.

2.5. A few common biases: recollection, network size, and reliability

The literature has paid great attention to the effects of name generators on collected data (Campbell & Lee, 1991; Marin, 2004; Marsden, 2011). In comparison with self-administrated modes of data collection, collecting network data in face-to-face interviews is a very reliable mode (Matzat & Snijders, 2010; Vehovar, Lozar Manfreda, Koren, & Hlebec, 2008). Furthermore, computer-assisted personal interviews (CAPIs) offer advantages compared to interviews on paper. Some softwares have been especially developed to collect such data in an interactive way whereby the respondent is able to visualize her/his network at the end of the collection task (Lozares Colina et al., 2011; McCarty et al., 2007). Whereas free recall of network data has been found to present good scores of reliability and validity (Ferligoj & Hlebec, 1999), the wording of questions, their order, and the complexity of tasks may impair the quality of the data (Marsden, 2011).

Network size is often used as a rough measure of social capital: Individuals with small networks are considered socially isolated while individuals with large networks are considered socially integrated. Whereas in a complete network study the network size is the population size, in ego-centered networks, the network size may vary widely. Therefore, it is possible to restrain the range, either by asking for a specific number of alters or by limiting the total amount of alters. In large surveys, the number of alters is often strictly limited. For instance, respondents could mention up to five names in the GSS, up to four names in the MOSAiCH, and up to seven in the SHARE. Network size has to be carefully considered, as it is easily influenced by external factors such as the interviewers' instructions (Marsden, 2003). For instance, the inclusion of interviewers' instructions to probe "anyone else" if only a few members are cited might change the network size (Marsden, 2003). As an example, scholars using the results of the GSS pointed out an increasing social isolation in the United States, comparing network size in 1985 and in 2004 (McPherson et al., 2006), a result that was then contested (Fischer, 2009) and explained by

interviewer effects (Paik & Sanchagrin, 2013).

Besides network size, another major question is the stability of the answers or, in other words, whether the alters remain the same or change over time according to the name generator. Some scholars have found that there is a difference between the core and the periphery; network members at the core are likely to be named repeatedly, whereas network members at the periphery are not (Morgan, Neal, & Carder, 1997). The consistency of answers has also been successfully checked by repeating the same task twice over a four-week interval (Bass & Stein, 1997). Regarding the FNM, its reliability over time has been addressed to some extent by using a sample of university students. A sample of students filled out the FNM twice, with a month's interval in between, and their responses indicated stability regarding composition and other network indicators (Monney, 2007). Generally, durable ties tend to be with intimates who have provided social support, are in frequent telephone contact, or are kin (Marsden, 1990; Wellman, Wong, Tindall, & Nazer, 1997). In contrast, weak ties are more easily forgotten. Delineation criteria focusing on important people or discussion partners have little effect on the core of reported egocentric networks (Straits, 2000). In summary, the reliability of name generators is satisfactory, but careful attention has to be paid to the numerous sources of errors (Marsden, 2011), as is the case for all survey questions (Alwin, 2007).

2.6. Ego-centered networks using name generators in Swiss studies: an enriching variety of topics

Several previous studies conducted in Switzerland have adopted an ego-centered network approach based on a name generator (see Appendix A). In the '90s, a major survey on social stratification in Switzerland ("*Tous égaux?*") already encompassed a key module on social participation (Levy, Joye, Guye, & Kaufmann, 1997). In the first decade of the 21st century, Widmer and his colleagues conducted a number of studies on family configurations based on the FNM: a longitudinal study on individuals undergoing psychotherapy in West Switzerland (Widmer, Orita, et al., 2008; Widmer, Kempf-Constantin, Robert-Tissot, Lanzi, & Carminati, 2008; Widmer & Sapin, 2008), a study on university students (Widmer, 2006), a study comparing first-time and stepfamilies in the canton of Geneva (Aeby et al., 2014; Widmer, Favez, Aeby, De Carlo, & Doan, 2012), and a study on old people's living conditions in five cantons (Oris, Nicolet, Guichard, Monnot, & Joye, in press). Another line of studies opened up networks to all types of significant alters beyond family by asking about important people. The FNM was therefore adapted to be more inclusive (Widmer, Aeby, & Sapin, 2013). Those studies encompassed various topics, such as the transition to parenthood (Le Goff & Levy, 2011; Sapin & Widmer, in press), sexuality (Bianchi-Demicheli, Favez, Van der Linden, Ortigue, & Widmer, 2009), and the occupational aspirations and orientations of teenagers (Guilley et al., 2014). At the national level, a network

module mainly based on the GSS name generator about discussion partners was implemented in the 2005 MOSAiCH survey, administered to a representative sample of more than 1,000 adults. This survey highlighted the association between network dimensions and geographic mobility (Ohnmacht, 2009; Viry, 2012). The 2013 wave of the MOSAiCH again included a network module. The social networks module of the SHARE survey was also administrated in Switzerland (Börsch-Supan, Brandt, Litwin, & Weber, 2013). In addition, it should be noted that other network studies have been conducted in Switzerland, though with complete networks (Bühlmann, David, & Mach, 2012; Kriesi & Jegen, 2001).

After this overview of previous Swiss research on personal networks, we introduce the survey entitled Family tiMes (Gauthier, Joye, & Widmer, 2010), funded by the Swiss National Science Foundation, from which the data used in this paper were drawn. The Family tiMes survey was based on a representative sample of 803 individuals (406 women and 397 men) living in Switzerland and belonging to two distinct birth cohorts (421 of them born between 1950 and 1955, and 382 of them born between 1970 and 1975). The Family tiMes survey included cross-sectional, ego-centered network data as well as retrospective longitudinal life course data. One objective of this survey was to understand the impact of life trajectories on the composition and structure of ego-centered networks at different life stages (Aeby, 2015). The Family tiMes survey was carried out in 2011 in Switzerland within a larger comparative framework, which included Portugal and Lithuania. Respondents were asked to provide a list of important individuals in their current life by answering the following question: "Who are the individuals who, over the past year, have been very important to you, even if you have not got along well with them?" The question did not include any specification about the network size. As the data collection was done using a CAPI method, an automatic stop was implemented at 20 alters. However, none reached this limit, as the maximum amount of alters was 17. Based on the initial sample of 803 individuals, we initially eliminated 17 questionnaires for the network analysis. These questionnaires were all administered by the same interviewer and were excluded because of poor data collection quality. We then had a sample of 786 valid networks, whose size varied from 0 to 17. Among the 786 valid networks, 31 were empty—in other words, respondents did not mention any significant other (3.9%). In the MOSAiCH study on discussion partners, there were even more individuals who did not cite anyone (12%). For analysis, those networks had to be put aside, as they did not include any relationship. The complete functional data set for network data had 755 respondents. Network size therefore ranged from 1 to 17, with a mean of 3.9 and a standard deviation of 2.15. Altogether, respondents mentioned 2,943 alters.

3. Network Measures: Case illustration with the Family tiMes survey

First of all, we have to distinguish between dimensions related to network composition and dimensions related to network structure. Concerning network composition, we show how a typology of personal networks can be created from the list of important alters and how to measure educational homophily from the characteristics of the alters. Concerning network structure, we explain several indicators with applied examples. All computations were made using the R statistical environment (R Development Core Team, 2011) and, more specifically for network analyses, the statnet package (Handcock, Hunter, Butts, Goodreau, & Morris, 2008). Up to now, to our knowledge, R is the only statistical software to provide so many extensive network packages (see sna package for network dynamics; Snijders, 2001). We like to mention that the Ucinet software is often used to perform network analysis on complete networks, used conjointly with the Pajek and Netdraw softwares (Borgatti, Everett, & Freeman, 2002). Nevertheless, when handling a great number of ego-centered networks, the R software is very functional and, last but not least, has the great advantage of avoiding importing and exporting data back and forth.

3.1. Ties that matter and homophily in personal networks: investigating network composition

For the sake of the demonstration, we will first explore the composition of personal networks to assess what types of ties are important for individuals. As we previously discussed, the choice of a name generator delimits the list of alters. The name generator based on important alters considerably opens the list of potential alters in comparison, for instance, with the role-relation name generator. Therefore, it is relevant to consider using a list of predefined categories to ease the process of recollection for the respondents and recodification for the researchers. In the Family tiMes survey, we used a show card with an extensive list of 51 personal terms (see Appendix B). Forty-one terms were cited at least once. The number-one relationship was the partner, mentioned by 73% of the respondents, followed by friends and children, mentioned by slightly less than half of the respondents (45%).

We proceeded to our first recodification of the personal terms, putting together the ones that were similar (for instance, the same family structural position, such as father-in-law and mother-in-law, or the same kind of ties, such as "step"). We then proceeded to a second recodification; we only kept categories mentioned by more than 4% of the respondents and put the others into a residual category. We ended up with 15 categories, by order of importance: partners (72.6%), daughters (32.5%), sons (31.8%), female friends (29.8), mothers (27.6%), male friends (25.0%), sisters (20%), fathers (16.7%), brothers (14.8%), colleagues (9%), collaterals (6.6%), other non-kin

members (4.9%), siblings-in-law (4.8%), and the residual category (12.5%).

A common procedure in research is to create descriptive typologies that summarize the complexity of social phenomena in a meaningful way using cluster analysis. In our case, a typology could interestingly highlight a few types of personal networks based on important alters. The main idea is to consider whether a tie was mentioned or not by a respondent and then create groups representing personal networks based on the salience of specific ties. Following standard exploratory multivariate statistics (Tabachnick & Fidell, 1996), as applied to textual data, principal components analysis with a varimax rotation was used to extract the initial factors.[6] Seven factors that explained 62% of the variance were retained to reach around two thirds of the explained variance. The seven factors' scores were inputted into a hierarchical clustering analysis based on a measure of the Euclidean distance between individuals and on the Ward clustering algorithm (Ward, 1963).[7] Thus, we obtained a solution with seven clusters (see Figure 1), by order of importance: *female friend and children oriented* (24%), *nuclear oriented* (22%), *parent based* (12%), *sibling based* (12%), *partner and buddy oriented* (10%), *kinship based* (8%), and *professional and non-kin oriented* (7%). Finally, we created an eighth personal network to include the empty networks: alone (4%). Another procedure is to consider the order of citation, assumed to reveal the importance of the distinct ties (D'Andrade, 1995), and to perform sequence analysis followed by cluster analysis (Guilley et al., 2014, p. 139).

Personal networks including kin ties were prominent. In addition, no matter the main orientation of the network, partners were central figures in most cases. The partner belongs to kinship even if, depending on the process of institutionalization of the couple (Cherlin, 1978, 2004), partners may be more or less integrated in the kinship circle. Nevertheless, two personal networks were strongly based on non-kin ties, one on friends and the other on colleagues. Even in strictly family networks, there were networks oriented toward friends perceived as family: the *friendship* type for 6% of university students (Widmer, 2006) and the *friend* type for 12% of respondents in the study on first-time and stepfamilies (Aeby et al., 2014; Widmer et al., 2012). The professional type, in contrast, only appeared in surveys based on personal networks in general, such as the *professional* type for 9% of respondents in the MOSAiCH (Viry, 2012). Finally, one network, *partner and buddy oriented*, was clearly based on both types of ties. In conclusion, there is a diversity of personal networks, but this diversity is somewhat limited, as it can be reduced to eight meaningful personal networks.

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[6]We used the *principal* function contained in the *psych* package.
[7]We used the functions *dist* (method = *euclidean*) and *hclust* (method = *ward*), both contained in the *stats* package.
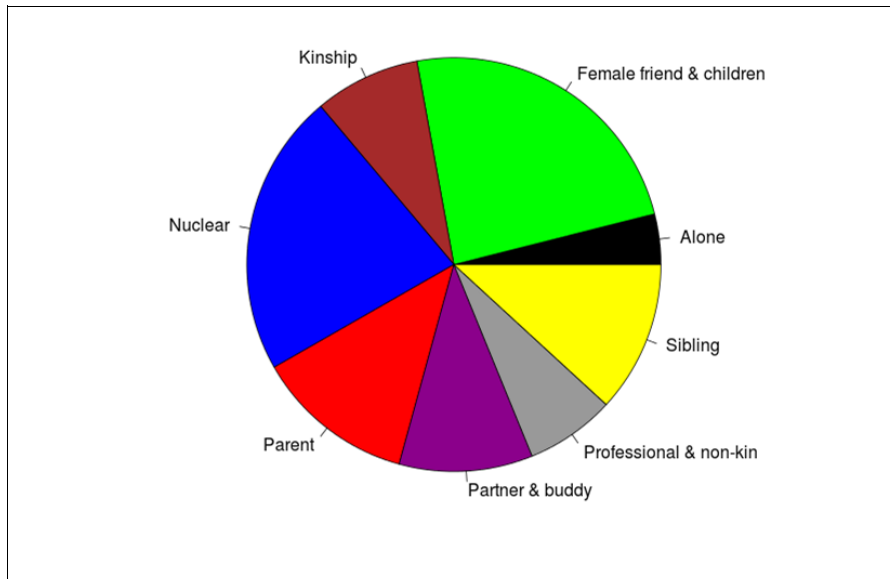
Figure 1. Distribution of the personal networks.

Second, we will assess the tendency toward educational homophily. Sociodemographic information was collected on network members regarding their sex, age, education level, occupation, and country of residency. Information about the relationship was collected as well, such as the nature of the relationship, duration of the relationship, perception of the relationship as family-like, and cohabitation history (being a former or present cohabitant). Technically, those characteristics are called *attributes*. In Appendix C, a table shows the data entry form of the FNM, indicating the list of network members for one respondent, a female belonging to the 1970–1975 birth cohort. Although data collection was directly performed using a laptop, we present the paper version of the FNM to explain how this instrument works concretely. Drawing upon the work of Lozares et al. (2011), we show tendencies toward homophily and heterophily using contingency tables in which homophily corresponds to being associated with alters belonging to the same group, while heterophily corresponds to being associated with alters belonging to other groups. As previously stated, individuals tend to get acquainted with other individuals sharing similar characteristics, and this is particularly true regarding education level (Marsden, 1988; McPherson et al., 2001). Homogamy is equivalent to homophily, but it is restricted to the couple relationship. In the Swiss survey on social stratification, "*Tous égaux?*," 44% of the couples were found to be homogamous regarding education (Levy, Joye, Guye, & Kaufmann, 1997). We considered all the alters divided into four groups according to their education level[8] (in rows) and the egos similarly divided into four groups (in columns). Table 1 shows the number of cases, the percentage, the adjusted percentage, and the residuals. Residuals indicate whether a category was under- or overrepresented, statistically estimating the difference between the empirical value and an

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[8]The education level was first codified using the 23-levels scale used in the European Social Survey (ESS), ranging from 1 (primary school not achieved) to 23 (PhD diploma), and then recoded into four levels of education: lower secondary, upper secondary, vocational, and tertiary. Other scales can be used to produce more-refined categories.

estimated value (based on the χ2 test). Residuals lower than -2 indicate underrepresentation while those higher than 2 signal overrepresentation. Respondents were associated with alters having the same education level, as the diagonal (in bold) was highly significant, indicating homophily. The group of egos with a tertiary education was associated to a lower extent with the group of alters with an upper-secondary education. No other group showed heterophilous tendencies, confirming a tendency toward occupational education.

Table 1. Educational Homophily Based on Education Level Between Egos and Alters (n = 2,390[9])

Alters		Egos				
		1. Lower Secondary	2. Upper secondary	3. Vocational	4. Tertiary	Total
1. Lower Secondary	N	65	22	132	20	239
	%	31.7	12.9	8.8	3.9	10
	% adj.	**21.7**	2.9	-1.2	-6.1	
	res.	9.83	1.21	-1.48	-4.38	0
2. Upper secondary	n	10	24	89	52	175
	%	4.9	14.1	5.9	10.1	7.3
	% adj.	-2.4	**6.8**	-1.4	2.8	
	res.	-1.29	3.27	-1.99	2.34	0
3. Vocational	n	118	86	1134	184	1522
	%	57.6	50.6	75.5	35.8	63.7
	% adj.	-6.1	-13.1	**11.8**	-27.9	
	res.	-1.1	-2.14	5.76	-7.92	0
4. Tertiary	n	12	38	146	258	454
	%	5.9	22.4	9.7	50.2	19
	% adj.	-13.1	3.4	-9.3	31.2	
	res.	-4.32	1	-8.24	**16.23**	0
Total	n	205	170	1501	514	2390
	%	100	100	100	100	**100**

3.2. Bonding and bridging social capital: investigating network structure

For the sake of demonstration, we will finally investigate the structural interdependencies of emotional support among network members with regard to the importance of personal networks as a source of bonding and bridging social capital. As in complete networks, it is possible to compute network indicators in ego-centered networks if the ties between the network members have been collected. This means that respondents not only estimate their own relationships with their network members but also the relationships existing among all members (Borgatti, Everett, & Johnson, 2013; Carrington, Scott, & Wasserman, 2005; Scott, 2000; Wasserman & Faust, 1994).

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[9]We dropped missing cases and alters under 25 years old.

Relationships can involve interaction, exchange of emotional and/or instrumental support, influence, conflict, etc. *Multiplexity* indicates whether there are multiple relationships between the same individuals. Individuals are technically referred as *nodes* or *vertices* and ties between them as edges.

In Table 2, relationships between respondents and their alters are indicated for the three dimensions investigated in the Family tiMes survey, namely, interaction, emotional support, and conflict.[10] The female respondent of our example mentioned five important individuals in her life: her partner, her mother, and three female friends. The respondent met and gave emotional support to all her significant alters. Her partner was the only one with whom she indicated the potential for conflict.

Table 2. Data Entry Form of the FNM Indicating the Emotional Support of Relationships Between Network Members

Person X	13. Among the persons you have just mentioned, who do you see on a regular basis?	14. Among the persons you have just mentioned, who could give you emotional support if needed?	15. Among the persons you have just mentioned, who could anger you (annoy you)?
1.Ego	2,3,4,5,6,	2,3,4,5,6,	2,
2. Partner	1,3,5,6,	1,6,	1,3,5,
3. Mother	1,2,	1,4,	1,
4. Female friend	1,	1,	2,
5. Female friend	1,2,6,	1,2,6,	6,
6. Female friend	1,2,5,	1,2,5,	5,

To get a better view of the web of relationships, it is possible to summarize the information contained in Table 2 into adjacency matrices such as the matrix of emotional support shown in Table 3, where 0 means no relationship and 1 indicates the presence of a relationship. In our case, ties are unvalued (binary or unweighted), and therefore, ties are simply present or not (1 or 0). However, ties can be valued (continuous or weighted), like the frequency of contact on a valued scale (for example, from 0, *no contact*, to 5, *daily contact*). The network indicators are then computed on the matrices or edge lists.

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[10] The questions were as follow: "(1) Among the persons you have just mentioned, who do you see on a regular basis? And what about the first person you have mentioned: Who does she/he see on a regular basis (the respondent included)? And what about the second person, etc.; (2) Among the persons you have just mentioned, who could give you emotional support if needed? And what about the first person you have mentioned: Who could give her/him emotional support if needed (the respondent included)? And what about the second person, etc.; (3) Everyone has conflicts and tensions with other individuals. Among the persons you have just mentioned, who could anger you (annoy you)? And what about the first person you have mentioned: Who could anger her/him (annoy her/him) (the respondent included)? And what about the second person, etc."

Table 3. Matrix of Emotional Support Relationships

	Ego	Partner	Mother	Female friend	Female friend	Female friend
Ego	0	1	1	1	1	1
Partner	1	0	0	0	0	1
Mother	1	0	0	1	0	0
Female friend	1	0	0	0	0	0
Female friend	1	1	0	0	0	1
Female friend	1	1	0	0	1	0

The network of interaction is undirected (symmetric), while the two networks of emotional support and of conflict are directed (asymmetric). Undirected means that the relationship either exists or does not exist. Directed means that the relationship has a direction; emotional support can be received and/or given. Three overlapping sets of alters were considered. The first set was defined as the respondent's *full network* because it included all individuals who were considered to be important. The second set is technically known as the respondent's *in-neighborhood*, and the third set as the respondent's *out-neighborhood*. Emotional support in-neighborhood refers to the set of people who receive support from the respondents, while and emotional support out-neighborhood refers to the set of people who give support to the respondents. Conflict in-neighborhood refers to those people who have been annoyed by the respondents and conflict out-neighborhood refers to the set of people who have annoyed the respondents. Graphically, a respondent's in-neighborhood is represented by an arrow pointing toward the respondent, while in a respondent's out-neighborhood, the arrow points away from the respondent toward the support providers.

Indicators of network structure inform us of the structural interdependencies among network members, here regarding interaction, emotional support, and conflict. Moreover, structural interdependencies of emotional support are used to measure social capital in personal networks. Perceived emotional support has often been used as a measure of social capital (Lochner, Kawachi, & Kennedy, 1999), as it refers to the ability to provide guidance and moral comfort. A high density and a high transitivity of emotional support indicate tight interconnections and, therefore, bonding social capital. High centralization, high centrality, and a great number of weak components of emotional support reveal more centralized networks and, therefore, bridging social capital (Widmer, 2006, 2007). Ambivalence, which is revealed by the conjoint presence of emotional support and conflict, is another interesting topic to investigate when interested in personal life (Lüscher, 2002; Lüscher & Pillemer, 1998). To sum up, there is a wide array of indicators of network structure. We only present a selection well suited for the study of small, ego-centered networks: size, density, transitivity, weak components, betweenness centralization, and betweenness centrality (Burt, 1995, 2002; Scott, 2000; Wasserman & Faust, 1994; Widmer,

2006, 2007). Indeed, some more sophisticated indicators request large, complete networks (Carrington et al., 2005).

Size indicates the number of alters (with or without ego) included in the full network and in the neighborhoods. The size of the in-neighborhood corresponds to the in-degree centrality and the size of the out-neighborhood to the out-degree centrality. Some indicators refer to the connectivity of networks, such as density and transitivity. *Density* is the number of existing connections divided by the number of pairs of significant alters cited by the respondent. *Transitivity* refers to properties of a group of three actors (*triads*). Triads are transitive when i => j and j => k and then i => k. This means that when individual i gives emotional support to individual j and individual j gives emotional support to individual k, in transitive triads, individual i will also give emotional support to individual k. Transitivity is likely in most personal networks, as individuals tend to balance their relationships (Heider, 1958; Killworth & Bernard, 1976; Kumbasar, Rommey, & Batchelder, 1994). For each triad, there exist 16 possible networks, among which only four are transitive (Wasserman & Faust, 1994, p. 244). A *weak component* is a subset of individuals who are disconnected from the full network; the number of weak components indicates the extent to which the network is disconnected. Some other indicators refer to the centrality of specific individuals within the network. *Betweenness centralization* indicates the average difference in how central the most central individual is in relation to how central all the other individuals are. Closely related to betweenness centralization, *betweenness centrality* captures the proportion of connections involving a specific individual like the respondent. All scales were standardized by the network size and vary from 0 (*low*) to 1 (*high*).

In Appendix D, a table summarizes the different indicators and the related R functions in the statnet package,[11] as well as the results of the means for the Family tiMes survey. Regarding the density mean, it was higher for interaction (0.74) and emotional support (0.62) than for conflict (0.36), showing that conflict was less reported than interaction or support. In Figure 2, we show the network sociograms[12] of the same female respondent as in Appendix C and indicate the different network indicators. The full network had a size of six (the ego and her five alters). The density varied for the different kinds of relationships. The highest density was found for interaction (0.60) and the lowest density for conflict (0.27). The density of emotional support (0.53) indicated that exchanges of emotional support often occurred in this personal network. However, the respondent was very central (0.68) in mediating the flow of emotional support. Graphically, we can see that there were two groups of alters, one composed of her mother and a friend and the other composed of her partner and two other friends. The respondent was a broker between

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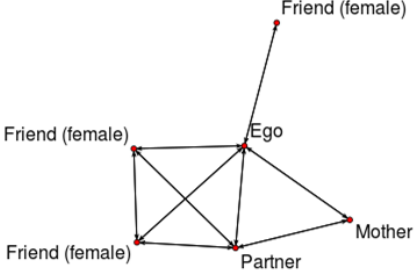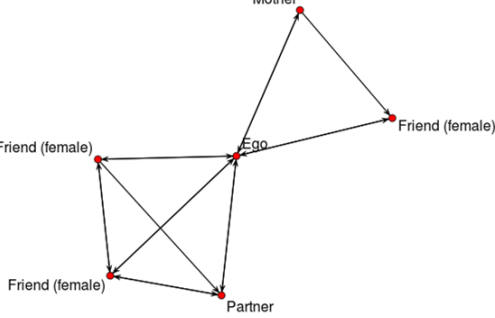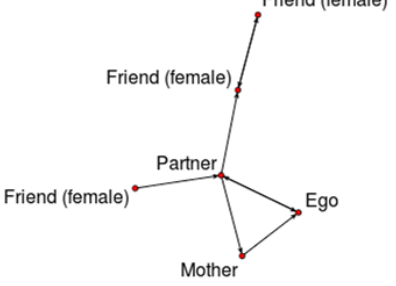
[11] The network indicators can be calculated on an R object with the *matrix* class or with the *network* class. It is easy to convert from one class to the other.
[12] Visualization of networks was obtained with the *plot.network* function in the *statnet* package.

those two groups. Concerning her conflict in-neighborhood, the respondent was a source of annoyance for her partner and her mother. Therefore, three individuals (including the respondent) composed this conflict in-neighborhood (in-degree: 3). Concerning her conflict out-neighborhood, the respondent was only annoyed by her partner (out-degree: 2). As they both sometimes got on each other's nerves, the out-neighborhood density was 1.

Figure 2. Example of sociograms depicting the relationships among network members.

Figure 2A. Perceived interaction.	*Figure 2B*. Perceived emotional support.	*Figure 2C*. Perceived conflict.
Full network Size: 6 Density: 0.60 Transitivity: 0.65 Weak components: 1 Betweenness centrality of ego: 0.50 Betweenness centralization: 0.48	**Full network** Size: 6 Density: 0.53 Transitivity: 0.58 Weak components: 1 Betweenness centrality of ego: 0.68 Betweenness centralization: 0.67 **In-neighborhood** In-degree centrality: 6 Density: 0.53 **Out-neighborhood** Out-degree centrality: 6 Density: 0.53	**Full network** Size: 6 Density: 0.27 Transitivity: 0.12 Weak components: 1 Betweenness centrality of ego: 0.15 Betweenness centralization: 0.38 **In-neighborhood** In-degree centrality: 3 Density: 0.67 **Out-neighborhood** Out-degree centrality: 2 Density: 1

Similarly to network composition, network structure is likely to be influenced by social position. Therefore, after generating networks indicators, it is very important to perform further analyses to investigate how network structure differs depending on social position and/or how different types of network structure differentially impact stress, well-being, the likelihood of finding a job, and other key outcomes. In addition, there is a link between network composition and network structure. Indeed, some social roles generate more structural interdependencies and ambivalence than others, for instance, the couple or the parent–child relationships compared to sibling relationships or kinship relationships compared to non-kinship relationships (Fingerman et al., 2004; Lüscher, 2002; Lüscher & Pillemer, 1998). In this paper, we show the impact of the composition of personal networks along with social position (measured by sociodemographic variables) on the exchange of emotional support. Three indicators in the full networks of emotional support were selected (density, centralization, and centrality), and since the distribution was not normal but instead squeezed to the right, indicators were dichotomized by the mean in either high or low emotional support in order to yield two contrasted and equivalent subgroups (see Table 5). We chose *nuclear-oriented* networks as the reference category since they represented the well-known ideal type of the nuclear family of procreation, including couple and parent–child relationships.

Structural interdependencies of emotional support were strongly associated with the types of personal network. In comparison with *nuclear-oriented* networks, most networks had a lower density of emotional support and a higher centralization and centrality of emotional support, showing that the nuclear family indeed enhances high interdependencies among its members. However, the extent to which other networks were less or more associated with the different indicators varied among them. *Professional and non-kin-oriented* and *female friend and children-oriented* networks had a significantly low density of emotional support. Thus, non-kinship relationships are not based on high interdependencies of emotional support. Regarding centralization and centrality, *professional and non-kin-oriented* and *female friend and children-oriented* networks had very high scores. *Partner and buddy-oriented* and *sibling-based* networks also had high scores of centralization and centrality.

Women had a high degree of betweenness centrality for emotional support, showing the key role they play in mediating exchanges of emotional support. Individuals with a lower secondary education had a higher density of emotional support, indicating that they develop more interconnected networks with less individual autonomy. Finally, no impact of birth cohort or of nationality on the structural interdependencies was found.

The network structure—and, therefore, social capital available within—was influenced by the composition of personal networks. Personal networks centered around the family of procreation (partner and children) mostly developed bonding social capital. In this personal network, based on an alliance between partners, blood between parents and children, and the same household, the density of emotional support was very high. Globally, personal networks composed of kin ties produced more bonding social capital and less bridging social capital. In contrast, personal networks focused more on friends, colleagues, or other non-kinship relationships developed more bridging social capital. These findings point in the direction of a remaining difference between solidarity provided by kin versus non-kin.

Table 5. Impact of Personal Networks on the Structural Interdependencies of Emotional Support, Logistic Regressions (Odds Ratios)

	High density	High centralization	High centrality
(Intercept)	*1.325*	*0.332****	*0.243****
Personal networks (ref: nuclear oriented)			
Female friend and children oriented	0.519**	3.173***	3.435***
Partner and buddy oriented	1.028	3.535***	5.036***
Kinship based	0.700	1.512	2.051*
Parent based	0.810	2.051*	2.294**
Professional and non-kin oriented	0.127***	3.775***	4.532***
Sibling based	0.690	2.210**	2.299**
Birth cohort (ref: 1950–55)			
1970–75	0.957	0.987	1.125
Sex (ref: men)			
Women	0.899	1.133	1.417*
Level of education (ref: vocational school)			
Lower secondary	2.030*	0.539†	0.710
Upper secondary	1.147	0.982	0.866
Tertiary	1.055	1.346	1.116
Nationality (ref. Swiss)			
Foreign	0.976	1.189	1.275
AIC	1014.0	913.1	905.0
R2	0.082	0.091	0.101
*Sig.: † p ≤ 0.1; * p ≤ 0.05; ** p≤ 0.01; *** p ≤ 0.001*			

4. Discussion

This article examined the potential of using ego-centered networks with a case illustration drawn from the Swiss survey Family tiMes. The main specificities of ego-centered network analysis based on the important alters name generator are summarized in Table 6.

Personal or ego-centered networks obtained from name generators have proven to be very revealing of issues related to new forms of personal life as well as social resources embedded in network structure. Examining briefly three topics, we first showed the interest of ego-centered network analysis in understanding the ties that matter in personal networks and, thus, shed light on the key position of partners and the growing importance of friendship in Swiss society. Comparing egos' and alters' levels of education, we then found a tendency toward homophily, in line with previous findings concerning social stratification in Switzerland (Levy et al., 1997; Tillmann & Voorpostel, 2012). Finally, as ego-centered networks can be turned into small, sociometric networks, we were able to measure the structural interdependencies of emotional support within personal networks. Looking closely at exchanges of emotional support, we showed that the composition of personal networks had an influence on the development of social capital, with kin-based networks favoring bonding social capital and non-kin-based networks favoring bridging social capital.

However, at the methodological level, ego-centered network analysis using name generators also has a series of drawbacks that need to be acknowledged. First of all, the network size is very sensitive to interviewer effects (Marsden, 2003) and, thus, may underestimate the number of alters and the amount of social capital when size is used as an indicator for it. This bias can be reduced by employing trained interviewers, having clear interview guidelines, and defining a minimum or maximum number of alters to report. Second, the network collection is based on the perception of only one respondent, the ego. This bias has also been found in other surveys based on a single informant. However, it is possible to develop a multiactor approach to overcome this problem, for instance, by interviewing several household members. Third, the main disadvantage for researchers interested in the availability of and accessibility to a wide array of specific resources may lay in the redundancy of the same resources and the overrepresentation of strong ties in comparison with weak ties. Therefore, in such cases, either multiple name generators rather than a single name generator may overcome this limitation (Marin & Hampton, 2007) or position and resource generators may prove to be more adequate (Van Der Gaag & Snijders, 2005).

Beyond those methodological drawbacks, it is important to underline that, contrary to complete networks, ego-centered networks can be integrated in large representative surveys and, thus, bring a more relational thinking to them. Besides, when collecting the relationships between egos

and their alters, the network structure can be investigated regarding interaction, emotional support, conflict, or any kind of relationship of interest. The network structure entails crucial information on closure, power, reciprocity, transitivity, and other social mechanisms underlying social relationships. In addition, going beyond theories of an abundance versus a deficit in social capital makes it possible to distinguish between a network structure favoring bonding social capital and a network structure favoring bridging social capital (Burt, 1995, 2002; Coleman, 1988; Widmer, 2006, 2010). Last but not least, a network approach, as well as a life-course perspective, for instance, gives more consistency to findings, as it does not merely theoretically assume but rather empirically treats human lives and social positions in society as structurally interdependent.

In conclusion, while the use of ego-centered networks in surveys is highly valuable, the choice of the name generator should be carefully considered in light of the research interest. In a best-case scenario, combinations of various indicators should be used conjointly.

Table 6. Ego-Centered Networks Based on the Important Alter Name Generator: Summary of Limits and Strengths

	Description	Limits	Solutions	Strengths
Network size	- The size is generally small, around 4 alters.	- Sensitivity to interviewer effects - Underestimation of the number of alters	- Employing trained interviewers - Having clear interview guidelines (e.g., probing for "anyone else") - Defining a maximum number of alters to report	- Emphasis on the core (strong ties) rather than on the periphery (weak ties)
Data collection	- The collection starts with the list of alters and then moves to network composition and network structure.	- Risk of burdensomeness	- Using CAPI methods to reduce the time for data collection and treatment - Using a show card with a list of personal terms	- Including the structural interdependencies (network structure)
Social resources	- Questions are asked about dyadic exchanges and exchanges within the network about, for instance, instrumental and emotional supports.	- Risk of redundancy of resources (alters giving access to the same type of resources)	- Using position or resource generators when interested in measuring access to a wide array of specific resources	- Issue of bonding and bridging social capitals
Sociodemographic information	- The list of information asked about the alters is extensive.	- Risk of burdensomeness	- Limiting the list to the key information needed	- Issue of homophily: for social stratification with the level of education and the occupation, for migration from the country of origin, etc.
Informant	- The information is reported by the participants.	- Perception of a single informant	- Developing a multiactor network approach	- Ego-centered perspective
Integration in surveys	- Contrary to complete networks, ego-centered networks can be integrated into large representative surveys.	- Time-consuming	- Having specific, well-documented network modules	- Relational thinking included in large surveys

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Appendix A

Studies Conducted in Switzerland Using an Ego-Centered Network Approach Since 2005 (Not Exhaustive)

Study	Sample	Name generator	Network composition	Network structure	Published references
MOSAiCH-ISSP 2005, module "Réseaux sociaux" (Measures and Sociological Observation of Attitudes in Switzerland—International Social Survey Programme) New module: MOSAiCH-ISSP 2013	More than 1,000 adults living in Switzerland (data collected 2005)	discussion partners (4 max.)	Type of tie; sex; age; level of education; occupation; current municipality; municipality at age 14; workplace municipality; relationship duration	influence and emotional support	Ohnmacht (2009); Viry (2012)
Step-Out ("Social Capital and Family Processes as Predictors of Stepfamily Outcomes")	300 women in families (150 first-time families and 150 stepfamilies) living in the canton of Geneva (data collected 2009–2010)	significant family members (no limit)	Type of family tie; sex; age; level of education; current municipality; relationship duration; frequency of contact	emotional support, instrumental support, influence, and conflicts	Aeby et al., 2014; Widmer et al., 2012
Family tiMes ("Trajectoires familiales et réseaux sociaux: une perspective configurationnelle sur le parcours de vie")	803 individuals from two birth cohorts, 1950–1955 and 1970–1975, living in Switzerland (data collected 2011)	important people (20 max.)	Type of tie; sex; age; level of education; occupation; country of residence; relationship duration; perception of the relationship as family-like; co-residence history; degree of trust	contact, emotional support, and conflicts	Gauthier, Joye, & Widmer (2010)
VLV ("Vivre-Leben-Vivere: Old Age Democratization? Progresses and Inequalities in Switzerland")	3,635 individuals aged 65 and over in the cantons of Geneva, Wallis, Bern, Basel, and Ticino (data collected 2011–2012)	significant family members (5 max.)	Type of tie; sex; age; level of education; residence (commune); relationship duration; frequency of contact; degree of trust	emotional support, instrumental support, influence, and conflicts	Oris et al., In Press
"Devenir Parent"	3-wave panel with 232 couples wherein women were pregnant at the first wave (data collected 2005–2009)	important people (15 max.)	Type of tie; sex; age; occupation; residence (commune); relationship duration; age of the youngest child; potential negative role	contact, emotional support, and instrumental support (for only the first 6 alters, but always including partner and child[ren])	Le Goff & Levy (2011); Sapin & Widmer (in press)
"Sexual desire: an interdisciplinary	600 individuals (300 men	important people	Type of ties; sex; age (under 18	contact once a week	Bianchi-Demicheli et al.

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and sexological approach" (University Fund Maurice Chalumeau)	and 300 women) aged 25 to 46 in the canton of Geneva (data collected 2011)	(20 max.)	years old were excluded); level of education; relationship duration; conjugal status duration; number of children; 8 subjective questions about ego's perception of her/his alters' sexuality		(2009)
Longitudinal study of individuals undergoing psychotherapy	Individuals undergoing psychotherapy compared with a control group; various samples: see references	significant family members	Various information: see references	Various kinds of relationships: see references	Widmer, Orita, et al. (2008); Widmer, Kempf-Constantin, et al. (2008); Widmer & Sapin (2008)
SHARE ("Survey of Health, Aging and Retirement in Europe")–network module in 2010 (4th wave)	More than 1,000 individuals living in Switzerland (data collected 2010, 4th wave)	discussion partners (6 max.) and a person important to them for any reason (1 max.)	Type of tie; sex; geographical proximity; frequency of contact; feeling of closeness; network satisfaction	none	Börsch-Supan et al. (2013)
The Cohort Secundos LIVES	Secundos born between 1988 and 1997; pilot survey: 2012–2013 ($n = 134$); main survey, 1st wave: 2013–2014 ($n = 1,631$)	Individuals between 15 and 24 years old, living and having had most of their schooling in Switzerland, with whom the respondent has had regular contact during the last 3 months (outside household and work)	Type of common activity between respondent and alter; parents grew up in CH; country of birth; region of residence; Swiss nationality?; number of nationalities; preferred spoken language	none	Not yet Internal report: Elcheroth & Antal (2013)
PNR 60 "Egalité entre hommes et femmes," project: "Aspirations et orientations professionnelles des filles et garçons en fin de scolarité obligatoire: Quels déterminants pour plus d'égalité?"	3,300 students aged between 13 and 15 (with their parents and teachers) in the cantons of Geneva, Vaud, Bern, Argovia, and Ticino (data collected 2011)	important people (4 max.)	Nature of the tie; student feels supported by this person regarding her/his studies; person agrees with her/his occupational choice; same opinion about equality of chances; student's occupational choice is influenced by this person	none	Guilley et al. (2014)

Example of a Show Card: Predefined List of Personal Terms*

Current partner (married or not)	1	Half-brother	27
Former partner (married or not)	2	Half-sister	28
Father	3	Partner of siblings (of ego or his/her partner)	29
Mother	4	Brother-in-law	30
Son	5	Sister-in-law	31
Daughter	6	Uncle	32
Brother	7	Aunt	33
Sister	8	Cousin, male	34
Grandfather	9	Cousin, female	35
Grandmother	10	Nephew	36
Father-in-law	11	Niece	37
Mother-in-law	12	Grandnephew	38
Great-grandfather	13	Grandniece	39
Great-grandmother	14	Godfather	40
Grandson	15	Godmother	41
Granddaughter	16	Godson	42
Great-grandson	17	Goddaughter	43
Great-granddaughter	18	Friend, male	44
Stepfather	19	Friend, female	45
Stepmother	20	Employee (domestic)	46
Son of stepparent	21	Colleague	47
Daughter of stepparent	22	Landlord	48
Stepson	23	Guest	49
Stepdaughter	24	Employer	50
Son-in-law	25	Other (person)	51
Daughter-in-law	26		

It should be noted that in many surveys there is an additional category for neighbors.

Appendix C

Example of a Data Entry Form of the FNM Indicating the List of Network Members

Person	1. Who are the very important individuals to you?	2. Sex	3. What is the tie with the respondent?	4. Age	5. How old were you when you met that person?	6. Where does that person live (municipality or country)?	7. Level of achieved education	8. Occupational activity	9. How often do you see that person face to face?	10. How often do you do have contact with that person by other means?	11. Have you ever lived together?	12. Do you consider that person a family member?
1	Ego	F	-	37	-	Switzerland	Vocational education (12)	Nursing associate professional	-	-	-	-
2	Reto*	M	Partner	42	26	Switzerland	Vocational education (16)	Construction worker	Every day	Several times a week	yes	yes
3	Anna*	F	Mother	65	Birth	Switzerland	Vocational education (12)	Clerk	Several times a week	Several times a week	yes	yes
4	Karen*	F	Female friend	36	19	Switzerland	Vocational education (12)	Medical assistant	Several times per year	Once a week	yes	yes
5	Isabel*	F	Female friend	38	30	Switzerland	Vocational education (12)	Childcare worker and adult trainer	Several times a week	Several times a week	yes	yes
6	Manuela*	F	Female friend	41	27	Switzerland	Vocational education (12)	Childcare worker and adult trainer	Once a week	Once a week	yes	yes

All names are fictitious.

Network indicators	Relationships	Family tiMes results	R functions from the *statnet* package
Full network			
Size (with ego included)	General	Mean: 4.9; SD: 2.15; median: 5	network.size(x) *NB: x: an object of class* network
Density	Of interaction	Mean: 0.74; SD: 0.27; median: 0.8	gden(dat)
	Of emotional support	Mean: 0.62; SD: 0.27; median: 0.6	
	Of conflict	Mean: 0.36; SD: 0.34; median: 0.27	*NB: dat: one or more input graphs*
Transitivity	Of interaction	Mean: 0.78; SD: 0.3; median: 1	gtrans(dat, measure = "weak")
	Of emotional support	Mean: 0.67; SD: 0.35; median: 0.75	
	Of conflict	Mean: 0.75; SD: 0.37; median: 1	
Weak components	Of interaction	Mean: 1.3; SD: 0.79; median: 1	components(dat, connected="weak")
	Of emotional support	Mean: 1.21; SD: 0.74; median: 1	
	Of conflict	Mean: 2.64; SD: 2.12; median: 2	
Normalized betweenness centrality of ego *NB: Since network size has to be higher than 2 to compute centrality, 64 networks of 2 were dropped.*	Of interaction	Mean: 0.23; SD: 0.32; median: 0.02	norm.between <- function(x) { if(is.null(x)) return(NULL) bw <- betweenness(x, nodes=1) ns <- network.size(x) nbw <- bw/(((ns-1)*(ns-2))) return(nbw)}
	Of emotional support	Mean: 0.28; SD: 0.3; median: 0.17	
	Of conflict	Mean: 0.12; SD: 0.23; median: 0	
Betweenness centralization *NB: Since network size has to be higher than 2 to compute centralization, 64 networks of 2 were dropped.*	Of interaction	Mean: 0.23; SD: 0.33; median: 0.03	centralization(dat, betweenness)
	Of emotional support	Mean: 0.29; SD: 0.3; median: 0.22	
	Of conflict	Mean: 0.15; SD: 0.24; median: 0	
In and out neighborhoods: ego.extract(dat, neighborhood=c("in","out")); delete.vertices(x)			
In-degree centrality (size of the in-neighborhood)	Of emotional support	Mean: 4.42; SD: 2.02; median: 4	network.size(x)
	Of conflict	Mean: 2.67; SD: 1.71; median: 2	
Density in-neighborhood (19 and 232 NA)	Of emotional support	Mean: 0.7; SD: 0.24; median: 0.67	gden(dat)
	Of conflict	Mean: 0.79; SD: 0.23; median: 0.85	

Out-degree centrality (size of the out-neighborhood)	Of emotional support	Mean: 3.75; SD: 1.93; median: 4	network.size(x)
	Of conflict	Mean: 2.58; SD: 1.65; median: 2	
Density out-neighborhood (24 and 232 NA)	Of emotional support	Mean: 0.82; SD: 0.21; median: 0.92	gden(dat)