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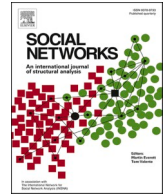
Friends, family, and family friends: Predicting friendships of Dutch women

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ABSTRACT

Friends are an important source of well-being but people differ in who they consider to be friends. With a unique quantitative test of such differences based on 17,650 social relations of 706 Dutch women (aged 18–41), of whom 40% were considered friends, we examined (a) which kind of personal relations were typically identified as friends (e.g., family, colleague), (b) how this linked to relationship closeness, face-to-face and non-face-to-face contact, and (c) whether these relationship characteristics of friendships differed with age. Most friends were met at school (>70%) and 20% of family were considered friends. Friendships were often close relationships with more non-face-to-face contact, while meeting in person was less predictive. Relatively older women reported fewer friends. Even in this homogenous sample with multiple measures of tie strength, friendships were difficult to predict and often overlapped with other social roles, meaning that researchers should be careful in using friendship as distinct category.

Friendships are crucial for well-being if only because they provide emotional support (Blieszner, 2015; Dunbar, 2018, 2021). People with more friends have better mental and physical health and live longer (Gillespie et al., 2015). This is likely due to support in terms of information and resources friends can provide (e.g., Siedlecki et al., 2014). The importance of friends has increased in recent history in Western countries because families became smaller, divorce became more frequent (Albert et al., 2021; Bell, 1981; Roseneil and Budgeon, 2004), and people no longer mainly relied on family for subsistence and jobs (Allan, 2008). Furthermore, social norms became more progressive and individualistic, resulting in more single people and higher ages at first marriage (Second Demographic Transition; Kaa, 1987; Lesthaeghe, 2010). Personal networks shifted from dense networks with many family members to more sparse networks including many friends, of which some could be considered as "family of choice" (e.g., Allan, 2008; David-Barrett, 2019; Weston, 1991). Despite this importance of friendships for well-being we lack a consensus about who are labeled as friends in the scientific community as well as for individuals in society (Allan, 1998; Fehr, 1996; Fischer, 1982a,b).

It is often observed that people differ in who they consider as friends (Fischer, 1982a,b; Gillespie et al., 2015), yet many studies still use the label of friend as if a clear-cut category. We follow up on classic empirical studies on friendship by providing a unique test on how much

people vary in their friendships. In this study we leverage a homogenous representative sample of Dutch women (age 18–41) who reported on an exceptionally large number of relations (25) to provide a new perspective on friendships. These large personal networks allow us to assess both close and more distant interaction partners. Distal relationships received much less attention in the friendship literature (Gillespie et al., 2015) but are increasingly recognized as an important part of everyday social interactions (e.g. Gaag, 2005). Our innovative approach also allows for new insights into methodological considerations in personal network studies, which predominantly request participants to categorize their network members as either family, friends, colleagues, or other, implying that these categories are mutually exclusive. Our aims were to examine to what extent different social roles overlap, which interaction partners are most likely to be labeled as friends by women, and if this varies from emerging adulthood to middle adulthood.

Who are labeled as friend?

People differ in whom they consider as friends. Fischer (1982a) showed that what constitutes a friend was defined in various ways across prominent dictionaries. Fischer's subsequent lexical study of friendship definitions with 1050 Californians showed that some people include kin while others do not; some people are strict in their use of the word using

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the label only for long-lasting, close relationships, while others use it liberally including almost anybody. Moreover, people are inconsistent in calling someone a friend or not at different moments in time (Fischer, 1982b; see also Dunbar, 2018). More recent studies on friendship corroborate these findings by showing that a friend can both refer to lifelong confidants as well as acquaintances known via social media (Gillespie et al., 2015; Pahl and Spencer, 2010). Fischer (1982b) showed that a condition for friendship was not necessarily tie strength (e.g. closeness), but sociability (i.e. spending time together). One way to look at the label of 'friend' is as residual label to those who are not family members, colleagues, or neighbours, and he therefore suggested that it would be best to avoid the term in scientific work on social relationships. Based on Fischer's work, we might expect that friends are mainly those personal relationships that people engage with in social behaviors, who do not fit in any other clear-cut relationship category.

Another influential scholar on friendships, Graham Allan (1998), came to a different conclusion. He argued that friendship is not an indication of social position such as being a brother, colleague or neighbor, but rather a relational aspect, indicative of the quality of the relationship. Friends are just 'high-quality' relationships: people with whom you are close and take effort in to meet. Based on this conclusion, we would expect that friends are those people who are very close.

Although people differ in whom they consider as friends, intuitively they have little trouble distinguishing between friends and non-friends (e.g., Rose and Serafica, 1986; Weiss and Lowenthal, 1976). Thus, while there is disagreement on who is labeled as a friend, people seem to be confident they know what one is.

Friendship characteristics

A comprehensive/all-inclusive definition of friendships is difficult to find, but key features of friendships are that they are voluntary, close, positive and enduring relationships between two people (Bell, 1981; Blieszner, 2015; Fehr, 1996; Weiss and Lowenthal, 1976). None of these features, however, is a necessary condition (e.g., Bell and Coleman, 1999). Examining the roles between two people, friends can be seen as simple relationships based on shared activities (e.g., sports), but also intimate relations based on trust and emotional support (Pahl and Spencer, 2010). In this study, we do not aim to advance a definition of friendship but rather examine closely to what extent closeness, contact frequency, and (non)kin status are related to friendship, which have been considered key determinants of friendship in previous literature.

Closeness is probably the most prominent predictor of friendships. Although closeness, like friendship, can be defined in many different ways, it is often used to measure the importance of a relationship (e.g., Repinski and Zook, 2005) or the 'strength of a tie' (e.g., Brashears and Quintane, 2018). Marsden and Campbell (1984) showed that subjective closeness is the best indicator of relationship strengths, and describe closeness as the intensity of the relationship. But closeness is not a necessity for friendship: Fischer (1982b) showed that 83% of non-relatives that were involved in supportive social exchanges were considered friends, but only 25% of these non-relatives were considered close. Furthermore, despite the fact that friend and family relationships are becoming more alike (Allan, 2008; Roseneil, 2005; Weston, 1991), most people consider family relationships as closer than friendship relations (Fischer, 1982b; Neyer et al., 2011). Closeness is thus likely to be strongly associated with friendship but is certainly not a unique predictor as family relations are generally closer, nor is it a necessary condition for friendship, as not all friends seem to be close (cf. Small, 2017).

Although definitions of friendship often refer to frequency of contact as well (Dunbar, 2018; Hartup and Stevens, 1999), evidence that people more often have contact with friends than others is mixed. Adults often become friends with people they know via their partner or friends, or with people they meet often at work, at associations, or in the neighborhood (Johnson and Leslie, 1982). While Fischer (1982b) found that

contact frequency – which he called sociability – predicts friendship, Gaag (2005) found that family, work-relations and neighbors actually have a higher contact frequency than friends. On average, respondents met 70% of their relations at least once a week, while for friends specifically, this was only 55% (Gaag, 2005). Contact frequency will likely overestimate the importance of neighbors and colleagues (Marsden and Campbell, 1984). A possible explanation of these mixed findings is that contact frequency can both refer to personal contact (face-to-face interactions) as to other forms of contact including phone conversations, social media and email. In one study, frequent face-to-face contact was associated with higher relationship satisfaction, while other forms of contact did not (Emmers-Sommer, 2004).

Although family and friends are often treated as distinct categories (e.g., Chopik, 2017; Lee and Szinovacz, 2016; Wrzus et al., 2012), relatives certainly can be friends. For example, depending on age, 15–53% of British people consider a relative to be their closest friend (Pahl and Pevalin, 2005). Although many definitions of friendship propose that it is a close relationship that excludes sexual or family relations, in reality some people seem to consider their partner and family as friends as well. We therefore also take a closer look at the overlap between friends and family members in this study.

Friendship characteristics and age

Nowadays, people marry later and also become parents at a later age. This leaves the years after legally becoming an adult available for exploration and marks a time of instability and diversity (Arnett, 2000). This time, typically defined as ages between 18 and 25, is called emerging adulthood. In the late twenties, the diversity and instability are slowly changed with stable choices for a partner and work (Arnett, 2000). This change in social context can influence what is valued in friendships, and therefore makes for an interesting period to see how friendship characteristics might change during emerging and young adulthood.

Friends foster self-esteem and a sense of well-being in all stages of life (Hartup and Stevens, 1999). From childhood to old age, friends socialize each other in age-related behavior, and supportive and intimate relations with socially skilled individuals provide developmental advantages (Hartup and Stevens, 1999). Although friends are important in all stages of life, friendship characteristics are likely to differ across the life course. To start, the size and composition of the network changes with age (David-Barrett et al., 2016; Wrzus et al., 2013). Younger people are known to have a larger friendship network than older people (e.g. Wrzus et al., 2013). For example, emerging adults (age 18–24) report the largest number of friends (average of 5.2 for women), compared to higher age groups (the overall average was 3.9 for women; Gillespie et al., 2015). Moreover, the quantity of friends at age 20 predicted health outcomes at age 50, while at age 30 the quality of friends was more important (Carmichael et al., 2015). Thus, it seems that the selection of friends is more important for emerging adults, while quality time with friends becomes more important throughout adulthood (Carmichael et al., 2015). We thus expect that with increasing age, from emerging adulthood until middle adulthood, people are less likely to consider someone as friend.

Relationship characteristics also change with age. Adults above the age of 24 have less frequent interactions with others (David-Barrett et al., 2016), possibly because they are busier with work and family (Lachman, 2004). It could well be, therefore, that contact frequency is less important for friendship for older than for younger people. A higher closeness with friends which is observed for older adults may be a consequence of the fact that they have had a longer time to form close bonds with others (Akiyama et al., 2003). Newly formed relationships are often not directly considered friendships, but people can *become* friends (Hall, 2018). Older adults have had more time to bond with others, and can thus be expected to have more close friendships than younger adults. Overall, closeness might thus be a better predictor for

friendship for older adults than for younger adults.

Present study

Despite the significance of friendships, friends have been studied much less frequently than other social relationships including romantic relationships and kin relationships (Ryle, 2011). Furthermore, quantitative assessments of friendships have mainly focused on the individual differences in the number of friends people have (e.g., Gillespie et al., 2015), but not on friendship characteristics. We employ a novel quantitative approach to examine which members of the personal networks are labeled as friends, and assess which relationships characteristics are most predictive of friendship status. This allows us to shed light on the debate whether friends are mainly high-quality relationships or just relationships without a clear label. We thus quantitatively examine a) if friendships generally are distinct from other relationship categories and b) how well closeness and contact frequency can predict if someone is considered a friend or not. As friendship characteristics are known to differ with age (Wrzus et al., 2016), we also investigate the influence of age on the relation between tie characteristics and friendship.

Our study extends the current literature in four ways. First, network data were collected using the state-of-the-art Graphical Ego-centered Network Survey Interface (GENSI) method which provided detailed information on 25 relationships per respondent (Stark and Krosnick, 2017; Stulp, 2021). This method allowed us to measure (relatively) large networks while reducing respondent burden.

Second, to get a grip on *which personal relationships* are most frequently reported as friends, we first asked where respondents knew their network member from and subsequently whether these persons were considered friends (see Fig. 1). This design uniquely allows for testing which social interaction partners are most often labeled as friend, because friend was not presented as a pre-defined category when asked where respondents knew their network member from, and transcends typical surveys on friendships in which people are asked to name (some of) their friends or to indicate what kind of relation they have with their interaction partners, with friend as one of the pre-defined categories.

Third, we examined the interdependencies between closeness and contact frequency in labelling someone as friend or not, thereby extending studies that have only focused on one of these variables or have combined them into a single measure (Brashears and Quintane, 2018). Here we also distinguished between face-to-face contact and other forms of contact, and examined if the salience of relationship characteristics changes from emerging till middle adulthood.

Fourth, where most research on friendships focuses on the differences between family and friends (for an exception, see Pahl and Pevalin, 2005), we explicitly considered the overlap between family and friendship relations and examine the role of friendships in family relations. Friends and family members in one's personal network seem to be interdependent: more family means relatively fewer friends (Wrzus

et al., 2012). Furthermore, family members can also be friends (Pahl and Pevalin, 2005).

Method

Participants

In this paper we make use of data of the LISS (Longitudinal Internet Studies for the Social Sciences) panel administered by CentERdata (Tilburg University, The Netherlands). The LISS panel is a representative sample of Dutch individuals who participate in monthly Internet surveys. The panel is based on a true probability sample of households drawn from the population register. Households that could not otherwise participate are provided with a computer and Internet connection (Scherpenzeel, 2011). A longitudinal survey is fielded in the panel every year, covering a large variety of domains including work, education, income, housing, time use, political views, values and personality. For further details on the representativity of the LISS panel, response rates, and attrition rates, please see Scherpenzeel (2009), Scherpenzeel and Bethlehem (2011), and the LISS panel website (www.lissdata.nl).

This study was part of an additional survey added to the LISS-panel, the *Social networks and fertility* survey (Stulp, 2021; Stulp and Barrett, 2021). The aim of the study was to investigate social influences on fertility intentions and outcomes. For this survey all women in the LISS-panel between the ages of 18 and 40[1] (N = 1322) were invited to participate between February 20 and March 27, 2018 (this age range was chosen because the study on reproductive intentions was aimed at women of reproductive age). In total, 758 women responded to the survey (57%), with a mean age of 29 (SD = 6.5). Respondents had comparable demographic characteristics to non-respondents (see https://doi.org/10.34894/EZCDOA). Respondents received € 12.50 for completing the survey.

For ease of comparability, we only selected respondents that listed 25 alters (N = 740). Furthermore, those that reported errors in filling in relevant questions were also dropped (N = 6), as well as those that said they had done the survey on their phone (N = 10; against instructions). Finally, we only selected cases that had minimal non-response; respondents with 10 or more missing values on the variables of closeness or both forms of frequency of contact were excluded (N = 18). This led to a final sample of 706 respondents.

Ethical approval for this particular study was obtained through the ethical committee of sociology at the University of Groningen (ECS-170920). For information on the ethical approval on the LISS-panel as a whole, see www.lissdata.nl/faq-page#n5512. The survey was in Dutch and is provided – together with an English translation of the questionnaire at https://doi.org/10.34894/EZCDOA. The R-code needed to run the data processing, analyses, and visualizations within this manuscript can be found at https://doi.org/10.34894/BWLBA8. The LISS data is available via www.lissdata.nl/access-data.

Procedure

Respondents first received a block of questions concerning partnership status, fertility status, and fertility desires. Subsequently, they were asked to list 25 people from their social network (alters) using the following question: "Please list 25 names of individuals 18 years or older with whom you have had contact in the last year. This can be face-to-face contact, but also contact via phone, internet, or email. You know these people and these people also know you from your name or face (think of friends, family, acquaintances, et cetera). You could reach out to these people if you would have to. Please name your partner in case you have one. The names do not have to match perfectly; you can also

Fig. 1. Survey flow.

The flow diagram contains the following boxes:
- Personal characteristics (e.g. age of respondent)
- Alters (25 names)
- Origin of the relationship (*"What is your relationship with <name> or how do you know him/her?"*)
- Relationship characteristics (e.g. closeness to alter, per alter)
- Friendship (*"Which of these people do you consider a friend?"*)

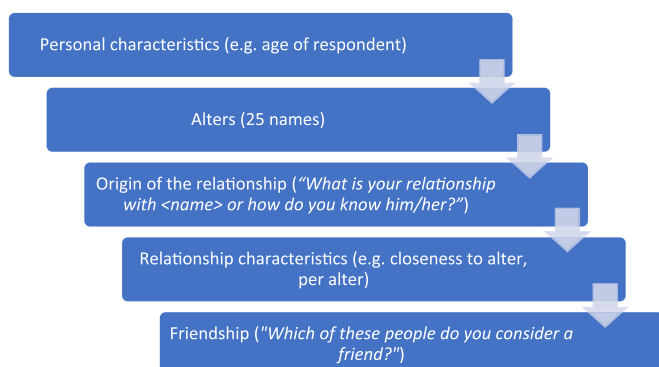[1] One respondent got the invitation at age 40, but turned 41 just before answering the survey.

use nicknames. It is important that you would recognize these names in a future survey. For this research it is important that you actually name 25 individuals!" (see also McCarty et al., 2007a,b). After having listed 25 names, respondents were asked to provide information about the alters, including: age, origin of the relationship (e.g., parent, via high school, via work), closeness, frequency of contact (both face-to-face and other forms of contact), and if this person was considered as friend or not (see Fig. 1).

We used GENSI, a novel survey-approach for collecting personal networks (Stark and Krosnick, 2017; Stulp, 2021) to collect our data. For an example of the workings of GENSI, see https://doi.org/10.34894/EZCDOA. The code to produce this survey can also be found there. Age of the respondent was provided by LISS.

Measures

Origin of the relationship

The origin of the relationship was asked for every alter with the following question: "What is your relationship with *alter X* or how do you know him/her?". There were fourteen possible answers (see Table 1, "Original"), including an option "other, namely …", and multiple answers could have been selected. We used the "highest" option (first in the list) chosen by the respondent to determine the primary relationship, as the sequence of options is related to the length of the relationship[2] (first options were family members, then schoolmates, last social activities, etc.). For example, when someone was known via primary school and secondary school, the primary relationship between ego and alter was coded as primary school.

Table 1
Frequencies and percentages of the categories describing the relationship between ego and alter. 'Original` refers to the original classifications that respondents saw on screen, `Recoded` refer to the recoded classifications, and `Final` refers to the final classifications (see text).

Primary relationship	Original		Recoded		Final	
	N	%	N	%	N	%
Partner	489	2.8	489	2.8	489	2.8
Parent	1226	7.0	1226	7.0	1226	7.0
Sibling	1190	6.7	1190	6.7	1190	6.7
Kin	2485	14.1	2485	14.1	2485	14.1
In-law	1324	7.5	1324	7.5	1324	7.5
Partner's friends	903	5.1	903	5.1	903	5.1
Primary school	514	2.9	514	2.9	514	2.9
High-school	1100	6.2	1100	6.2	1100	6.2
College	1691	9.6	1691	9.6	1806	10.2
Work	2571	14.6	2571	14.6	2571	14.6
Social activity	1633	9.3	1633	9.3	1728	9.8
Mutual acquaintance	1154	6.5	1154	6.5	1299	7.4
Neighborhood	717	4.1	717	4.1	717	4.1
Other	641	3.6	39	0.2	101	0.6
Other: Friend			185	1.0	185	1.0
Other: Roommate			115	0.7		
Other: Via children			62	0.4		
Other: Via family			62	0.4		
Other: Via internet			53	0.3		
Other: Caregiver			37	0.2		
Other: Traveling			42	0.2		
Other: Ex-partner			25	0.1		
Other: Via ex-partner			21	0.1		

Note. The question was interpreted in two ways "what is my relationship to this person" (e.g., parent, kin, friend) and "how do I know this person" (e.g., high school, college).

The answers in the "other" category (3.6%) were manually checked and corrected if necessary. For example, if the answer in "other" was "mother", we manually categorized this as the available but not chosen option "parent". We classified all remaining instances of "other, namely …" into already existing categories or one of nine additionally constructed categories (Table 1, "Recoded"). For example, "adoption family" was categorized as "kin", and "met online" as "via Internet". Some labels in the "other" category were ambiguous and interpretational choices had to be made.[3] Twelve alter relationships were left empty; we considered these to be non-kin.

Although we explicitly did not provide the option "friend" in the origin of the relationship question, given that we were interested in the overlap between different social roles and friendship, a minor fraction (1%) network members were labelled by the respondent through the "other" category as "friend" (N = 225). When friend was the only given label, these instances were kept as a separate category "other: friend", to distinguish it from the question that explicitly asks who the respondent considers to be a friend. Note that the response of "friend" on the "other" category is ambiguous, as it could mean that the person is a friend, known via a friend, or a boyfriend[4] (although "known via a mutual acquaintance" and "partner" were possible options on the list).

The novel categories (Table 1, "Recoded") that accounted for less than 1% of the responses were subsequently collapsed into other categories, leading to a final of fifteen categories to classify the relationship between ego (respondent) and alter (contact person) (Table 1, "Final"). People that were met via traveling or Internet were recoded as known "via social activity". People known through family, children and ex-partners were recoded as known "via mutual acquaintance". Roommates were recoded as known via college. Caregivers and ex-partners were recoded as "other".

Relationship characteristics

Closeness was asked directly with the question "How close are you to these people?". Frequency of contact was asked for both face-to-face contact ("How often do you have face-to-face contact with these people?") and other forms of contact ("How often do you have contact with these people through other ways than face to face, for instance through (mobile) phone, letters, email, chat, SMS, and other forms of online and offline communication?"). For these relationship characteristics, the following instruction followed directly after the question: "Drag the circles [alters] to different answer categories below the screen. The circle will change color when it is placed in the square of the answer category.".

Closeness and both forms of contact frequency were measured on a 5-point scale (Fig. 3). There were two reasons for giving a choice of five response options. First, previous research shows that five options work well in personal network questionnaires (Ferligoj and Hlebec, 1999; Kogovšek and Ferligoj, 2005). Second, due to the visual design of the

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[3] For example, some people reported "son" or "daughter". This response could indicate that the person is the respondent's child, or that the respondent knows this person via their child. We assumed that these people were children of the respondents if they were aged 18. People could namely answer a minimum age of 18, because we only asked for alters that were 18 years or older. In all but one of these instances the person was indeed aged 18 or close to 18, and thus classified as kin. Similarly, when "ex-boyfriend" was given as a label, this could either refer to the actual ex-boyfriend or to this person being known via the ex-boyfriend (we assumed the first to be the case).

[4] Another choice relates to the same ambiguity in the Dutch language. In Dutch, "Vriend van." can both refer to "friend of …" and "partner of …". We chose to interpret these answers as "partner of", because, again, the option "friend of …" would be covered by the option "known through a mutual acquaintance". Something similar holds for "Vader van me vriend", which can refer to both "father of my friend" and "father of my partner". Thus, some measurement error exists because of this ambiguity, but this concerns less than 1% of the relationships.

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[2] The only exception was that in-laws were always coded as in-laws, because for example someone who is categorized as parent and in-law is not a parent of the respondent but of the respondent's partner.

survey, having more than five options would reduce the answering boxes in size and make them less visible and more difficult to use (see Stulp, 2021).

Friendship

After the questions as listed above, a question on friendship followed: "Which of these people do you consider a friend?", where each alter (as represented by a circle) could be clicked on. In Dutch, the word for friend ("vriend") is used similarly to the English phrase. Both the English term 'friend' and the Dutch equivalent 'vriend' originate from the Old English 'freond' and proto-Germanic 'frijojanan' (Franck and Cosijn, 1892; Clark, 2013).

Analytical strategy

We used R (R Core Team, 2018) for cleaning, transforming, analyzing, and visualizing all data. We made use of the following R-packages: patchwork (Pedersen, 2017), tidyverse (Wickham and RStudio, 2019), ggplot2 (Wickham, 2016), broom (Robinson et al., 2021), and lme4 (Bates et al., 2015). To examine to what extent individuals in different relationship categories are labeled as friend, the percentage of relations labeled as friend are reported for all alter categories (Fig. 2B). We similarly describe in percentages the extent to which closeness and contact frequency are associated with being labeled as friend (Fig. 3B). To disentangle the distinct effects of closeness and contact frequency and compare their magnitudes, we performed multi-level logistic regression in which alters were nested within respondents (Snijders and Bosker, 2011; Duijn et al., 1999). In the first model, we included age, closeness, frequency of personal contact, and frequency of other forms of contact as continuous variables. Age was centered by subtracting 29 (the average age in this sample), while closeness and frequency of contact were centered by subtracting 3 (meaning that 0 corresponded to neutral and a few times a month, respectively). We also included random intercepts, and random slopes for all tie characteristics, meaning that the intercept, and the slope between tie characteristics and being labeled a friend, could vary between respondents (Heisig and Schaeffer, 2019). Second, to examine whether the effects of the different measures of tie strength on whether a relationship is labeled as a friendship vary with age, we included interactions between age and the tie characteristics. We used the optimizing algorithm bobyqa in lme4.

All models were run twice: once including all alters except for family relations and once including only family relationships (parent, partner, sibling, kin, in-law). The reason for doing so is that previous literature and common wisdom suggested that the label "friend" is particularly in use for non-kin, and that closeness and contact frequency should be more closely tied to friendships among non-kin (as was also evidenced by our descriptive analyses; Figs. 2B, 3B, and Table 2). We used odds-ratios to examine and compare the magnitude of the effects.

We also calculated the number of correct classifications of friendships (how many of the alters considered as friend were correctly identified by the statistical model as "friend") based on the estimates from the mixed model. We provide three percentages: 1) the percentage based on the baseline model, which is identical to the percentage of friends in the sample; 2) the percentage based on the full model with random effects estimates; 3) the percentage based on the full model without the random effect estimates. This latter percentage can be seen as the success in classifying friendships for an average individual and comes closest to an out-of-sample estimate.

Results

Who are labeled as friend?

In total, the 706 respondents listed 7331 friends. On average, respondents listed 10 friends (SD = 5; Fig. 2A). Two listed no friends,

while nine reported all 25 alters as friends. Respondents were asked to describe the relationship between themselves and the alters (see Table 1) by using 13 answer categories, or by using a fourteenth option in which they could specify the relationship themselves. People known from high-school (83%), college (74%), and primary school (70%) were more often than not reported to be friends. Partners were labeled as friend 60% of the times. A bit more than half of alters that were mutually acquainted, partner's friends, or known via social activities were reported to be friends. Family was least likely to be reported as friend, in particular in-laws (13%). Parents and kin were still labeled as friends in about 15% of cases. "Friend" was not an option, yet there were 185 individuals that used this label to describe the relationship. This category was associated with the highest probability of being labeled as "friend" in a follow-up question with 85%[5] (Fig. 2B).

The probability of being labeled as friend was thus very different for family members and non-family relations (Table 2; Fig. 2). Indeed, among family members (including the categories kin, sibling, parent, and in-law) 20% were reported to be friends (1366 out of 6714) and among non-family relations 55% (5965 out of 10936). Therefore, in the remainder of the results, we split the analyses for family members and non-family relations.

Tie characteristics and friendships

Closeness was the strongest predictor of being labeled as friend (Fig. 3B; Table 2): with increasing levels of closeness, the chance of being reported to be a friend rose steeply. This was particularly true among non-family relations compared to family members (Fig. 3B): 91% of people that were very close to the respondent were labeled friends, where 5% of people were labeled friends among those who were not at all close. For family members, these numbers were 34% and 0% respectively.

A different pattern emerged when considering face-to-face contact: in non-family relations, there was no consistent pattern in the frequency of contact and the probability of being labeled as friend. For family members, there was a clear pattern: with increasing frequency of contact, the probability of a family member being reported as friend rose. Thus, face-to-face contact was only important for family members in explaining friendship status, not in non-family relations.

The pattern between frequency of other forms of contact and being reported as friend resembled that of closeness: with increasing frequency of contact, the probability of being reported as friend increased in both family and non-family relations (Fig. 3). Among non-family relations 78% of people that were communicated with daily were labeled friends, whereas this was 26% for people communicated with only a few times per year. For family members, these numbers were 41% and 5% respectively.

Closeness was positively correlated with both measures of contact frequency, but more strongly with other forms of contact ($r = 0.55$; 95% CI: 0.54–0.56; N = 17617) than with face-to-face contact ($r = 0.38$; 95% CI: 0.37–0.39; N = 17607). Both measures of contact were also correlated positively and rather strongly ($r = 0.65$; 95% CI: 0.64–0.66; N = 17599).

To get a better grasp on the importance of closeness and frequency of contact on being considered a friend and assess their unique contribution, we ran a logistic mixed model with being a friend as the dependent variable, and the three measures of tie strength and age as independent variables (Table 3). When considering non-family relations, these models showed that closeness was by far the strongest predictor for

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[5] 34 of the alters (0.2% of all alters) about which respondents wrote "friend" during the relationship questions were in a subsequent question not classified as a "friend". This may have two reasons: 1) because of the ambiguity of the answer, as the Dutch "vriend" could refer to "known via a friend" and even "boyfriend"; 2) the respondent forgot to select the respective alter.
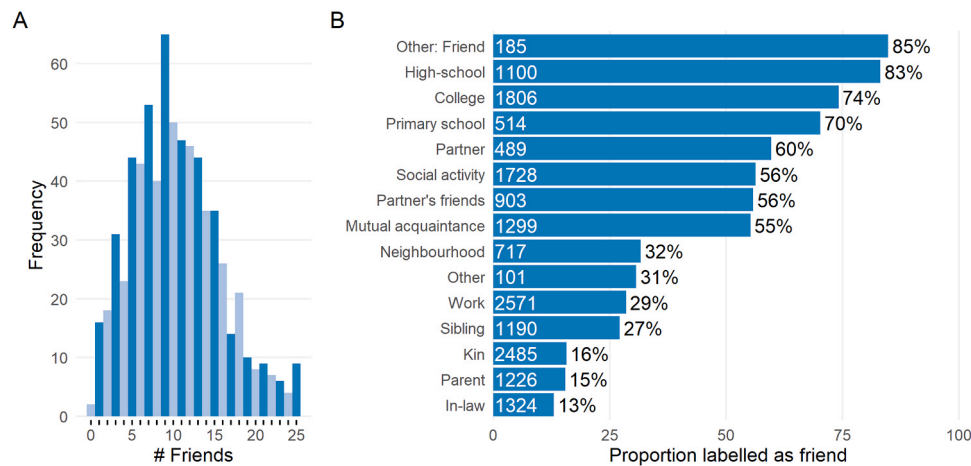
Fig. 2. The frequency distribution of the number of friends people have in their network (N = 706 respondents; panel A) and the percentage of alters that are reported to be a friend for different relationship categories (N = 17,650 alters; panel B).

friendship in non-family relations as evidenced by the odds-ratios. For closeness, one step higher in closeness meant almost 25 times higher odds of being labeled as friend (Model 1; $e^{3.20}$). Both forms of contact were about equally strongly associated with friendships (but in opposite direction), with a one-step change in contact frequency multiplying the odds by more than 2. Remarkably, and in contrast to the descriptive statistics, frequency of face-to-face contact was negatively associated with friendships; those more often seen face-to-face were less likely to be reported as friend, controlling for closeness and other forms of contact. Age decreased the probability of being reported as friend in non-family relations; with each year, the odds of labelling an alter as friend decreased by about 9%.

Within family members, the associations between closeness and frequency of contact and being labeled as friend were less strong, with an odds-ratio of 2 for closeness and 2.5 for the frequency of other forms of contacts (Model 3). In contrast to non-family relations, the odds of a family member being labeled as friend increased by more frequent face-to-face contact, with an odds-ratio of 1.3. Age was the weakest predictor, with an odds-ratio of 1.03, meaning that age hardly predicted whether a family member was labeled as friend or not.

To examine how well our three measures of tie strength (and age) can classify alters as friends, we calculated predictions from the models. For non-family relations, the model correctly predicted whether an alter was a friend for an average individual 78% of the time. This was much better than the baseline success of 55%. For family members, the model correctly classified 80%, which was identical to the baselines success rate. Thus, for family members, knowing three different measures of tie strength did not improve predicting whether an alter was a friend or not beyond knowing that only 20% of family members were labeled as friend.

Tie characteristics and age

To examine if the importance of closeness and frequency of contact on being labeled as friend differs with age, we included interactions between age and the tie characteristics in the logistic mixed model (with random slopes) with being labeled as friend as the dependent variable (Table 3). The main effects of the tie characteristics and age did not change meaningfully compared to the previous model without interaction terms. Overall, the interaction effects were small for both non-family and family relations (estimates <0.03). Closeness was a better predictor of friendship for older women (30−40) than for younger women (18−30) (in both family and non-family relationships). Face-to-face contact, on the other hand, was a better predictor for younger than for older women, and again this held for both family and non-family

relationships. The effect of other forms of contact was a bit different: this form of contact was a better predictor of friendship in non-family relationship for younger women, but a better predictor of friendship in family members for older women. All these interaction effects, however, have to be interpreted with caution as they are small in magnitude and their 95% confidence intervals either overlap or were very close to zero.

To illustrate the (small) magnitude of the interaction effects, we will provide the example of closeness: among non-family relations, the odds of being labeled a friend at age 29 was 24 times higher when the relationship was considered very close compared to close. For 18-year-olds, this was 22 times higher, and for 40-year-olds this was 27 times higher. Among family members, the odds of being labeled a friend at age 29 were 2 times higher when the relationship was considered very close compared to close. For 18-year-olds, this was 1.6 times higher, and for 40-year-olds, this was 2.5 times higher.

Discussion

"Friends"

Friends are crucial for well-being but our academic progress is hampered by an inconsistent and heterogeneous definition of what friendship is. One prominent perspective is that the large individual differences in friendships lead to the conclusion that friends are those people who are not labeled yet as family, colleagues, neighbors or other clear-cut social categories (e.g., Fischer, 1982a,b). Another prominent perspective sees friendship as an indicator of relationship quality, meaning that a friend is someone close who is frequently contacted (e.g. Allan, 1998). Our study has been uniquely able to quantitatively address this debate, thereby providing a deeper understanding of these contrasting definitions of friendships by using a novel approach to study friendships. Among 706 Dutch women aged 18–41 reporting on 17,650 relationships, we showed that relationship quality is indeed strongly related to friendship. Yet, 14% of non-close non-family relationships were considered friends countering the idea from one side of the debate (cf. Fischer, 1982a,b). Furthermore, there was considerable overlap between friendship and other relationship categories, such as being family or a partner, implying that a "friend" is not merely a residual label countering the other side of the argument. Both perspectives on friendship thus seem complementary in predicting friendships: if people are close (and non-family), they are most likely friends, but if they are not close and do not fit a clear relationship category they might also be considered as friend.

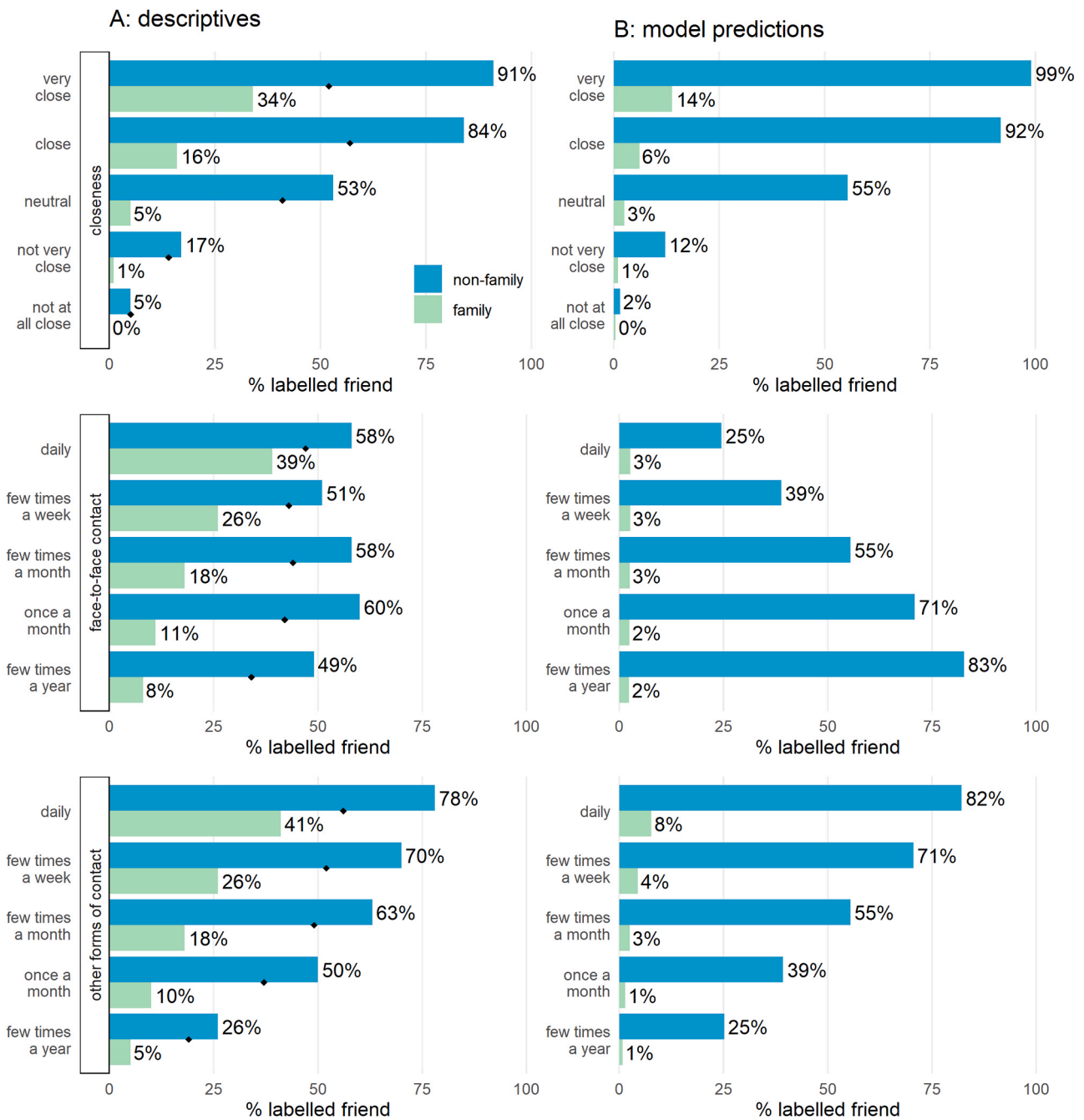Going into our main findings in more detail, we first showed that a

Fig. 3. Descriptive statistics (A) and model estimates (B) for closeness (top graphs), frequency of face-to-face contact (middle graphs), and frequency of other forms of contact (bottom graphs). Panel A: % of total alters in that category that is considered a friend. The diamond represents the % when family and non-family relations are collapsed. Panel B: logistic mixed model predicted probabilities. The height of the bar equals the parameter estimate and the percentages in text represents the 95% confidence interval around this estimate. Models were evaluated with the other factors on the third response option (i.e., "neutral", "few times a month") and age 29. An example: 84% of the non-family relations that were seen as close were considered a friend; the statistical model estimated this to be 97% given both forms of contact to be "a few times a month" and for a 29-year-old.

substantial number of network members were labeled as friend (40%). Even family members, those that are typically considered orthogonal to friends (Pahl and Pevalin, 2005), were seen as friends often (e.g., even in-laws were identified as friends 13% of the time). Similarly, partners were labeled as friend 60% of the time. There was substantial variation among women in how often they classified their relationships as friends: some reported no friends, whereas for others all 25 relationships in the personal networks were considered friends (see also Stulp and Barrett, 2021). This huge variation already suggests that women differ to a large extent in who they consider as friend. Moreover, the finding that family

members are also considered as friends is important here because this can have implications for research that tries to tie the number of friends to health outcomes. In this context, friends are seen as a distinct source of resources to family members who often feel more obliged to help out than non-family friends (Allan, 2008; Blieszner and Roberto, 2004). Only considering the number of friends could then be deceiving, as this may very well include family members (and perhaps even more so those that do provide help).

A second major finding is that closeness was by far the strongest friendship predictor, while face-to-face contact was only predictive for

Table 2
Descriptive statistics.

	Overall		Friends					
	(n = 706)		All (n = 706)		Non-family (n = 691–692)		Family (n = 453–455)	
	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range
Closeness	3.48 (1.16)	1.52–5	3.92 (0.53)	1.50–5	3.75 (0.57)	1.50–5	4.74 (0.43)	2–5
Personal contact	2.86 (1.31)	1.28–4.80	3.03 (0.85)	1–5	2.86 (0.60)	1.28–5	3.98(1.00)	1–5
Other contact	2.84 (1.33)	1.32–5	3.29 (0.73)	1–5	3.13(0.78)	1–5	4.17 (0.83)	1–5
Nr. of friends (n = 706)	10.38 (5.32)	0–25			8.45 (4.90)	0–25	1.93 (2.72)	0–23
Age (n = 706)	29.18 (6.50)	18–41						

Table 3
Logistic mixed model estimates, separated for family and non-family relations.

	Non-family				Family			
	Model 1		Model 2		Model 3		Model 4	
	estimate (se)	odds-ratio (95% CI)	estimate (se)	odds-ratio (95% CI)	estimate (se)	odds-ratio (95% CI)	estimate (se)	odds-ratio (95% CI)
Intercept	0.34 (0.10)		0.32 (0.10)		-4.15 (0.27)		-4.14 (0.27)	
Age	-0.10 (0.02)	0.91 (0.88–0.94)	-0.10 (0.02)	0.90 (0.87–0.93)	0.03 (0.02)	1.03 (1.00–1.06)	0.01 (0.03)	1.01 (0.95–1.06)
Closeness	3.20 (0.13)	24.56 (19.18–31.46)	3.18 (0.13)	24.09 (18.83–30.83)	0.71 (0.16)	2.04 (1.48–2.8)	0.70 (0.16)	2.01 (1.46–2.76)
Frequency of face-to-face contact	-0.90 (0.07)	0.40 (0.35–0.47)	-0.89 (0.07)	0.41 (0.35–0.47)	0.27 (0.11)	1.32 (1.07–1.63)	0.29 (0.11)	1.33 (1.08–1.65)
Frequency of other forms of contact	0.87 (0.08)	2.38 (2.04–2.78)	0.87 (0.08)	2.40 (2.06–2.79)	0.92 (0.12)	2.50 (1.99–3.14)	0.91 (0.12)	2.49 (1.99–3.13)
Age*Closeness			0.01 (0.01)	1.01 (0.99–1.04)			0.02 (0.02)	1.02 (0.98–1.06)
Age*F2F contact			-0.02 (0.01)	0.98 (0.96–1.00)			-0.01 (0.01)	0.99(0.96–1.01)
Age*Other contact			-0.02 (0.01)	0.98 (0.96–1.00)			0.01 (0.01)	1.01 (0.98–1.03)
sd Intercept	2.18		2.18		2.13		2.11	
sd Closeness	1.60		1.59		1.28		1.27	
sd F2f contact	0.98		0.96		0.84		0.84	
sd Other contact	1.01		1.01		0.57		0.57	
# individuals	706		706		695		695	
# alters	10906		10906		6685		6685	
% correct baseline[a]	55 / 92 / 78		55 / 92 / 78		80 / 92 / 80		80 / 92 / 80	

[a] The percentage of friends classified correctly. The first % is based on no model information (and equals the % friends in sample); the second % is the within-sample % taking into account random effects estimates; the third number is the % correct classification for an average individual (not taking into account random effects). See the text for further information.

family members. Closeness was most strongly associated with being labeled as friend. The odds of being considered a friend when the relationship was "very close" were over 6000 higher than those when the relationship was "not at all close" among non-family relations. For family members, this number was about 40, which is much weaker but still substantial. This large difference in magnitude can be explained in two ways: i) being considered a friend was less likely (~20%) among family members than among non-family (~55%), thus there was less variation to predict; ii) people might particularly vary in their concept and usage of the word "friend" when it concerns family members; some find it completely appropriate to consider their mom or siblings friends, whereas others would never use this term to describe their family.

Closeness was a strong predictor of friendship but still about one in ten non-family relationships that were close were not considered friends. Furthermore, 5% of non-family relationships that were not at all close, were still considered friends, versus 0% of family relationships. These relationships might belong to friend groups (cliques), but which themselves do not provide any kind of support (cf. Bellotti, 2008). Here, we only examined friendships from the perspective of ego, yet future studies could also examine the ties between alters, as previous research has shown that this perspective can provide additional insight into who are considered friends (e.g., Bellotti, 2008). Thus, closeness was the best predictor of friendships, but friends are not just high-quality relationships (as argued by Allan, 1998), as not all friends are close.

Face-to-face contact only had a minor role in friendship in comparison to closeness, in contrast to previous research (e.g. Emmers-Sommer, 2004). Moreover, for non-family members, those that were seen *less* frequently were more likely a friend (all else equal). These findings might be due to selection effects. People keep contact with non-family members who live further away who they care about most, but consequently also see less frequently. Research on free recall name generators suggests that people recall alters mainly based on closeness, contact frequency and status (Brewer, 2000; Töpfer and Hollstein, 2021). Thus, given that the respondents had to list a large number of names (i.e. 25) and listed their closest relationships first (who they may or may not have seen frequently recently), they may have subsequently listed individuals that were seen frequently (who may be recalled more easily) but were not necessarily close or friends, such as colleagues and neighbors. As shown by Hall (2018), face-to-face contact does make it more likely that two people *will become* friends. Furthermore, among family members, more face-to-face contact did make it more likely that this family member was considered a friend. Irrespective of the explanation, the frequency of face-to-face contact does not seem to be a robust measure of friendship in our sample which is at odds with previous literature.

Another reasons why face-to-face contact might be less predictive of friendships, could be that other forms of communication have become more prominent. More non-face-to-face contact (e.g. via phone), was indeed associated with a higher probability of being labeled as friend

among both family and non-family. While it is sometimes difficult to avoid personal contact (e.g. with colleagues), other forms of contact can be seen as more voluntary interactions. The choice of whom to communicate with through phone and texts could be a better predictor of friendship. Indeed, it is possible to identify people's closest relations by looking at mobile phone communication (David-Barrett et al., 2016). Other forms of contact can thus better predict friendships than face-to-face contact.

People's personal networks vary over the life course. For instance, with advancing age, people generally have fewer friends (Wrzus et al., 2013). Moreover, it is argued that older people value closeness over contact frequency (Akiyama et al., 2003). This implies that friendships may be determined by different relationship characteristics at different ages. We find little evidence for these suggestions. Although we did find that from 18 till 40 years of age women were increasingly less likely to consider non-family relationships as friend, we did not find that closeness was differently related to friendship and only some indication that frequency of contact might become less important for friendship in non-family relations with advancing age. This effect of contact frequency, though, was several orders in magnitude smaller than the main effects of age and the relationship characteristics. A focus on life events instead of chronological age could be a promising direction to further examine differences in friendship characteristics over the life course, as, for example, a new job, marriage, or parenthood all shape networks to a great extent (cf. Bidart and Lavenu, 2005).

How accurately can we predict friendship status on the basis of three measures of tie strength? For non-family relations, we are able to classify about 78% of alters correctly on whether they are a friend or not. While this is substantial, this still means that one in five network members are classified wrongly. This number is even more striking when considering that we studied a relatively homogenous sample of Dutch women with a rather narrow age range. Including men (Hall, 2011; Sapadin, 1988), older individuals, and individuals from different countries and cultures would certainly increase the number of alters that are incorrectly predicted. Overall, we present clear quantitative evidence that people differ to a great degree in who they consider their friend.

In summary, closeness determines friendship status to a much greater extent than measures of contact frequency. This mirrors conclusions from network scholars who argue that closeness is the most important measure of tie strength (Marsden and Campbell, 1984). Yet, not everyone that is close is labeled a friend. Even with three measures of tie strength we were not able to predict friendship status accurately. Thus, using a unique dataset to quantitatively address the question at hand, we showed that we cannot assume that people share common criteria for friendship (cf. Allan, 2008), and friendship labels are not consistently used by different people (cf. Fischer, 1982b).

These findings are important for researchers who, using name generators, try to elicit a particular subset of the network from respondents. Asking respondents to name friends may result in the inclusion of people not envisioned by the researcher (e.g., parents, partners, siblings). Furthermore, central figures in the network that are typically of interest, such as partners, may or may not be included.

The idea that people do not share common criteria does not mean that being considered a friend is not a privileged status. People may differ in what is important for them in a relationship. Some consider face-to-face contact key for maintaining a relationship, while for others it is the content of the conversations that determines the strength of the relationship. Similarly, there may be something qualitatively different about colleagues who are considered as friends compared to those who are not. Future studies could further examine these individual differences in who is considered as friend, to find out what kind of friends are important to whom and in what context.

Limitations

While our novel method has the advantages that we were able to

examine the role of friendships in relatively large networks include more distant relationships, there are also some things that we could not capture in this study. To start, closeness to friends or the contact frequency with friends in this study may only partly reflect relationship quality. The contents of what is being shared in these relationships is unknown here. Whether, for instance, important matters are discussed with the alter or whether the relationship can provide support, can be more important for considering someone as friend. For example, 45% of relations that people discuss important matters with are not considered as close relations (Small, 2013). These people were nonetheless included in the discussion network, because they had specific knowledge (e.g., a lawyer) or just because they were available for help or discussion. Furthermore, relations that people often met face-to-face turned out to be the most supportive in times of need, regardless of their closeness (Hurlbert et al., 2000).

A good predictor of friendship status in addition to closeness and contact frequency is the length of the relationship, particularly in non-family relations (Hall, 2018). Unfortunately, in our data there were no direct measures of relationship length. The origin of the relationship, however, does give some indication to the length of the relationship. Those met in primary school and high-school were considered friends frequently, and much more frequently than those met in the neighborhood or those that are the friends of the partner, which typically are known shorter. In contrast, those met in college were considered friends more often than those in primary school, suggesting that it is not only relationship length, but also in what phase of life people are met. For example, being able to select your friends in a group of like-minded people (e.g. college) may be a better recipe for friendship than when selecting friends in the constraints set by who is in your class in primary school. People are more likely to become friends with others who are similar to them (homophily; McPherson et al., 2001). Additionally, when people became friends may be more important than when people met for the first time; people often become friends at special occasions, outside their daily schedules (Goffman, 2019). A colleague known for five years might cross the line of friendship after a special night out. This critical moment can reveal more about the friendship than the length of relationship. Lastly, as the relationships we asked about were restricted to people that the respondent contacted in the last year, we might miss some friends or family that were only contacted sporadically. Future research could examine if people can be considered friends if they are not contacted in over a year.

Our homogenous sample already showed large diversity in friendships of Dutch women between 18 and 40 years old. Extending this population by also including men and a larger age range could provide important additional insights into the concept of friends. There are interesting differences between men and women regarding friendships; men might consider friends those people that they can hang out with, while women tend to care more about the emotional closeness in the relationship (Hall, 2011; Sapadin, 1988), although other research found no substantial gender differences (Gillespie et al., 2015). Women generally have more family members in their personal network than men (Albert et al., 2021; Fischer, 1982a), and might also be quicker to consider family as friends. Furthermore, we showed that younger women report a larger number of friends, this effect could be even stronger when a larger age range is taken into account.

To what extent family can be considered as friends is likely also influenced by cultural differences. In Germany and Iran, for example, personal networks include more kin than in the North America or France (Grossetti, 2007; Wellman, 2007), and in Iran friendships are almost exclusively same-sex relationships (Bastani, 2007). There is also some suggestion that people from the United States use "friend" more freely than their French counterparts (e.g., Carroll, 1988). The different results found by Fischer and Allan could also be due to cultural differences, as Fischer studied Americans and Allan studied Englishmen. Anthropologists focused mainly on kinship relations, leaving cultural differences in friendships largely understudied (Beer, 2001). If cultural differences in

friendships are considered, a distinction between Western and non-Western cultures is typically made (e.g. Bell and Coleman, 1999). Yet, results from Baumgarte et al. (2001) suggest that people in collective versus individualistic cultures differ less in friendships than might be expected, as they have about the same number of "best" friends, with similar duration and interdependence.

Lastly, future studies should examine the consistency in the use of friendship, to see for example if considering family as friends is consistent among participants. Taken together, the concept of friend might thus be even more variable and thus less meaningful than we showed in this study.

Conclusion

Friends have taken a prominent role in people's networks. Indeed, women in our sample reported on 25 network members, and on average 10 of those were considered friends, with some women reporting no friends and others reporting friends exclusively. Closeness and frequency of contact (both face-to-face as well as other forms of contact) predict friendship status, and particularly closeness is a strong predictor. Nonetheless, using three measures of tie strength that are considered most important, we were only able to correctly classify four out of five friendships. Using a more diverse sample in terms of age, sex, or nationality would certainly lower this predictive ability. We found some support for the idea that friendship is merely a measure of relationship quality as suggested by Allan (1998), as closeness was by far the best predictor of friendship. Similarly, however, we found support for the idea that friend is a residual label (as put forward by Fischer, 1982b), as not all friends were close and several alters who did not fit one of the prespecified categories (e.g. who were not family or colleagues) were explicitly mentioned as friend. Thus, notwithstanding the importance of friends in networks and for people's wellbeing, there is still much to learn about what makes a friend. Researchers should be aware that people have different definitions of friendship and that family members are also quite often considered as friend. We are inclined to follow Fischer's suggestion to be careful in the usage of the term friend in scientific work on social relationships.

Acknowledgements

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