



Exploring variation in active network size: Constraints and ego characteristics

Sam G.B. Roberts^{a,*}, Robin I.M. Dunbar^a, Thomas V. Pollet^b, Toon Kuppens^c

^a British Academy Centenary Project, Institute of Cognitive and Evolutionary Anthropology, University of Oxford, 64 Banbury Road, Oxford OX2 6PN, UK

^b Department of Social and Organizational Psychology, University of Groningen, The Netherlands

^c Division of Social and Organizational Psychology, Université catholique de Louvain, Belgium

ARTICLE INFO

Keywords:

Social networks
Personal networks
Individual difference
Constraints
Emotional closeness

ABSTRACT

Studies of active personal networks have primarily focused on providing reliable estimates of the size of the network. In this study, we examine how compositional properties of the network and ego characteristics are related to variation in network size. There was a negative relationship between mean emotional closeness and network size, for both related and unrelated networks. Further, there was a distinct upper bound on total network size. These results suggest that there are constraints both on the absolute number of individuals that ego can maintain in the network, and also on the emotional intensity of the relationships that ego can maintain with those individuals.

© 2009 Elsevier B.V. All rights reserved.

1. Introduction

Personal social networks in humans appear to consist of a series of sub-groupings arranged in a hierarchically inclusive sequence (Zhou et al., 2005). An individual ego can be envisaged as sitting in the centre of a series of concentric circles of acquaintanceship, which increase in size with a scaling ratio of ~ 3 (Zhou et al., 2005; Hill and Dunbar, 2003). As the number of alters in each layer of the personal network increases, the level of emotional intimacy and level of interaction between ego and alter decreases (Dunbar, 1998; Hill and Dunbar, 2003; Mok et al., 2007).

The innermost layer of the personal network is the support clique, which can be defined as all those individuals from whom one would seek advice, support or help in times of severe emotional or financial distress (Dunbar and Spoor, 1995), and averages about five members (Milardo, 1992). The next layer out is the sympathy group, which can be defined as those with whom an individual contacts at least monthly, and averages 12–15 members (Buys and Larson, 1979; Dunbar and Spoor, 1995). Studies of these ‘inner’ layers of the network have provided detailed information on the size and composition of these networks, the types of support that flow through the networks, the ties between alters in these networks and how these networks change over time (e.g. Degenne and Lebeaux, 2005; Fischer, 1982; McPherson et al., 2006; Plickert et al., 2007).

The active network refers to alters that ego feels they have a personal relationship with, and make a conscious effort to keep

in contact with (Hill and Dunbar, 2003), or alters whom ego has contacted within the last 2 years (Killworth et al., 1998). Studies of this outer layer of the network have thus far focused primarily on determining effective methods for estimating network size (Fu, 2007; Hill and Dunbar, 2003; Killworth et al., 1984; McCarty et al., 2001).

The different techniques used to measure the active network have a number of important practical applications, such as estimating hard-to-count subpopulations (Killworth et al., 1998) and produce broadly similar results in terms of the mean network size (between 100 and 300). These studies always reveal a large range of network sizes (with network sizes ranging from 20 to over 500) but none of these size differences have been explainable by ego characteristics such as gender, age or socio-economic status and thus the causes of variation in active network size are still poorly understood (Bernard et al., 1990).

At the innermost levels of the personal network, in contrast, many ego characteristics have been shown to affect network size and composition. Egos who are single and without children tend to have larger networks than egos who are married and/or have dependents (Dunbar and Spoor, 1995; Johnson and Leslie, 1982; McCannell, 1988). Networks show strong homophily by gender, such that female networks are dominated by females, and male networks by males (McPherson et al., 2006; Roberts et al., 2008). Female networks also tend to contain a greater proportion of kin than male networks (McPherson et al., 2006). Socio-economic status (as measured by education, occupation and income) is positively correlated with network size and also with network diversity (Campbell et al., 1986; McPherson et al., 2006). Network size tends to decline after 65 (Fung et al., 2001; Marsden, 1987), although a more recent survey found no association between age and network size (McPherson et al., 2006).

* Corresponding author. Tel.: +44 1865 612376; fax: +44 1865 612385.

E-mail address: sam.roberts@anthro.ox.ac.uk (S.G.B. Roberts).

URL: <http://www.icea.ox.ac.uk/about/staff/roberts> (S.G.B. Roberts).

The first aim of this study is to examine whether these demographic ego characteristics shown to affect network size and composition in the innermost layers of the network can also explain some of the variation in network size at the active level of the personal network. The second aim is to examine how the compositional properties of networks vary with network size. Ties between ego and alter can be thought of on a crude level as either 'strong' or 'weak' (Granovetter, 1973, 1983). Do large networks consist of many weak ties, or are large networks simply 'scaled up' versions of small networks, with more strong ties and more weak ties than small networks?

Strong ties are those alters at the inner layers of the network (support clique and sympathy group), and they provide extensive emotional, instrumental and social support to ego (Fischer, 1982; van der Poel, 1993). Maintaining these close, emotionally intense relationships is extremely cognitively demanding, partly because "the partner is important as a unique individual and is interchangeable with none other" (Ainsworth, 1989, p. 711). It takes a long history of interaction in a variety of contexts and emotional commitment to build up and maintain these relationships (Degenne and Lebeaux, 2005). Very close relationships have higher frequencies of both face-to-face and telephone contact than those slightly less close, but still important relationships (Boase et al., 2006; Mok et al., 2007). Even in close relationships, if an active effort is not made to maintain the relationship, it tends to decay over time (Cummings et al., 2006; Dindia and Canary, 1993).

In contrast, weak ties are more distant acquaintances of ego, and are less important in providing emotional or instrumental support or social companionship. However, weak ties are important in providing access to a greater variety of information, ideas and experience, because they are more numerous, more heterogeneous and – crucially – less likely to be connected to each other than strong ties (see Granovetter, 1983 for a review). Weak ties act as a form of social capital – one definition of which is "investment in social relations with expected returns" (Lin, 1999, p. 30). These weak ties are contacted less frequently than the strong ties (Hill and Dunbar, 2003), although a minimal level of contact may be necessary to keep the relationship active, and weak ties do show decay over time (Burt, 2000, 2002; Feld, 1997; Krackhardt, 1998). Further, information about the status of the relationship, the characteristics of the alter and their connections with others still need to be cognitively stored and managed (Donath, 2008; Whittaker et al., 2002), which may place a limit on the number of weak ties individuals can maintain at a given level of emotional intensity (Dunbar, 2008).

When considering the strength of tie between two individuals, the degree of relatedness also needs to be taken into account. Kinship itself provides a powerful bond over and above the personal relationship between two individuals. There are norms and expectations that assistance will be provided to kin, regardless of the personal relationship between the two individuals (Espinoza, 1999; Wellman and Wortley, 1990). Further, an ego is linked to kin through many different ties, and the network is dense, in that many of the network partners have ties themselves, simply through the fact that they are part of the same family (Plickert et al., 2007). In contrast, a friendship network is typically much less dense, with fewer of the network members having ties between themselves. The high level of 'structural embeddedness' in kin networks means that even if two individual kin do not maintain their dyadic relationship, they will still be linked and hear important news about each other through the wider kin network. The role of 'kin-keepers' – typically female members of the family who pass on family news and keep members of the extended family in contact with each other – is important in maintaining the extended kin network (Leach and Braithwaite, 1996; Rosenthal, 1985). In contrast in a dyadic friendship, the emphasis is on both friends maintaining the relationship, otherwise it will decay over time (Burt, 2000). The combination of

the obligation to help kin, and the high level of structural embeddedness means that kin are both cognitively and time-wise less demanding relationships to maintain than non-kin relationships.

The fact that as the number of alters in each layer of the personal network increases, the level of intimacy and level of interaction between ego and alter decreases (Hill and Dunbar, 2003; Mok et al., 2007) suggests that there are constraints on the number of relationships ego can maintain at a given level of intensity (Zhou et al., 2005; Roberts, 2009; see also Bernard and Killworth, 1973). These constraints may be cognitive (e.g. being able to keep track of a large number of relationships simultaneously) and/or time budgeting (e.g. building a relationship with an individual to a particular level of intensity takes a certain amount of time). Individuals only have a finite amount of time and cognitive effort to put into interacting with others and maintaining their network ties (Milardo et al., 1983; Pool and Kochen, 1978; Tooby and Cosmides, 1996) and there is evidence both for cognitive and time constraints on network size. In terms of cognitive constraints, the size of an individual's support clique is correlated with the number of levels of intentionality that an individual can process, whilst the size of their sympathy group is related to performance on a working memory task (Stiller and Dunbar, 2007). In terms of time constraints, individuals entering into a new romantic relationship show both a decrease in social network size (Johnson and Leslie, 1982) and a decrease in frequency and duration of actual interactions with network members (Milardo et al., 1983).

If network size is constrained by cognitive and/or time budget issues, we can make two predictions. First, we predict that large networks are *not* simply scaled up versions of small networks, but that large networks have more weak ties, because the number of strong ties that an ego can maintain is limited. Second, if there are constraints on the maximum number of individuals that can be maintained in the network (i.e. there are only so many 'slots' or 'friendship niches' [Tooby and Cosmides, 1996] in the active network available to be filled), we predict that egos with large related networks would have smaller unrelated networks, as has been demonstrated at the sympathy group level (Dunbar and Spoor, 1995). Thus, if an individual is born into a large extended family, this extended family will preferentially be given many of the slots available in the active network, and there will be fewer slots left over to fill with unrelated individuals (see Pool, 1980 as cited in Granovetter, 1983 for a similar argument). This logic only applies if those born into large extended families actually maintain contact with a large number of these family members, and this will be examined in this study.

An important question that arises in the discussion of strong and weak ties is exactly how to quantify tie strength. Marsden and Campbell (1984) examined a range of measures that could be used to assess tie strength, including emotional closeness, duration of relationship, the frequency of contact and type of relationship (kinship, neighbour, co-worker, friend). They concluded that a measure of the emotional intensity of a relationship is the best indicator of tie strength. Frequency of contact overestimates the strength of tie between neighbours and co-workers (see also Hill and Dunbar, 2003; Mitchell, 1987), and duration of relationship overestimates the strength of ties between relatives. Thus, we took emotional closeness as an indication of the intensity of the relationship, reasoning that strong ties would have a higher level of emotional closeness than weak ties.

2. Methods

2.1. Participants

Due to the length of the questionnaire participants were asked to complete (typically the questionnaire takes between one and

Download English Version:

<https://daneshyari.com/en/article/1129680>

Download Persian Version:

<https://daneshyari.com/article/1129680>

[Daneshyari.com](https://daneshyari.com)