Social Capital Resources and Network Embeddedness: An egonet approach

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Paper submitted for TASA Annual Conference, 2008, University of Melbourne, Dec.

Abstract:

Social capital is accessed through social networks. This paper proposes a method for studying the links between social capital and personal networks at the individual level. We describe a social capital resource (SCR) name generator method that utilizes the substantive domains of social capital resources as the basis of a multiple question name generator strategy for a social network analysis, egonet methodology. We demonstrate how this new method generates social capital profiles and measures of network size and multistrandedness that allow comparisons of cases or from cases to population means. We report some initial findings of differences in the variability of social capital profiles and personal network measures between cohorts of younger and older respondents.

Keywords:

Social capital, social network analysis, egonet methodology, name generators, youth.

Statement of authorship

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Social capital resources and egonet methodology

Social capital theory argues that people can use their social networks to access tangible, 'social capital' resources. In his overview of social capital concepts and research Field writes:

> The central idea of social capital is that social networks are a valuable asset. Networks provide a basis for social cohesion because they enable people to cooperate with one another… (2003:12)

This type of statement assumed that social networks, formed on ties of friendship, interaction and trust are qualitatively different to organizational networks based on formal, authority relations. Social networks thus provide, by definition, a readymade basis for cooperation. Discussions of networking practice and protocols suggest how to encourage social networking and present it as a worthwhile community investment (Gilchrist 2004).

Survey research on social capital has sought to demonstrate the tangible benefits that accrue to individuals with better social connections. Coleman's classic study was a population survey which showed that individual level measures of social connectedness correlated with higher human capital achievement (Coleman, Hoffer et al. 1982). What resources come through network connections? In this paper we propose a methodology that focuses on the content of personal network ties.

This paper describes a social capital resources (SCR) name generator that combines substantive content from social capital research with the practice of using a multiple

question, behavioral name generator as the basis of social network, egonet surveys. Social capital research suggests a range of useful questions to use as name generators. The adaptation of the questions as an egonet methodology provides ways to see the exact connections between an individual's social circle and their social capital resources. We report some indicative findings from pilot studies using the SCR name generator that bring out interesting differences between social capital profiles of younger and older cohorts.

Domains of social capital

In an important study Van der Gaag and Snijders (2005) set out to identify useful 'social capital' resources that individuals might access via their personal network contacts. They generated a list of practical items and asked survey respondents if 'they know anyone who …can help repair a bike or car; has knowledge of financial matters; can advise on family conflicts' etc. Respondents were asked to categorize the source of the resource as 'acquaintance, friend or family member' and also nominate if they themselves could provide that resource. A representative sample of just over 1,000 respondents provided sufficient data for scaling and latent trait (principal components) analysis.

The analysis of responses identified four subgroups of items. Van der Gaag and Snijers propose that these are four separate domains of social capital and, on the basis of items within each domain, they suggest the following descriptions of these domains:

- Prestige and education related social capital,
- Political and financial skills social capital,
- Personal skills social capital, and
- Personal support social capital.

These four domains of social capital provide a substantive base for the construction of interview or survey questions to assess an individual's social capital resources. If questions are spread evenly across the four domains we can compare the degree to which the social capital of different individuals, or cohorts, is spread equally across the four domains or is concentrated in certain domains rather than others. We have social capital 'profiles' that can be compared and contrasted.

A second, practical, benefit relates to question construction. The specific questions used by Van der Gaag and Snijders do not always translate easily to other social contexts. 'Do you know anyone who owns a car?' might be significant in Holland but makes little sense in Australia. Similarly, we found that questions need to be selected and tailored to suit younger and older respondents. Thinking of the questions in terms of the higher level domains of social capital identified by Van der Gaag and Snijders allows for sensible, contextual adjustments of this type.

Using social capital questions as name generators

In social network analysis egonet methods are used to map the way social (or other) network relations are bundled around an individual.[1] Egonet methods are based on the collection of network-sensitive information from individuals. Name generator questions are prompts to help a respondent recall people with whom they have contact. The aim is to produce a good list of the respondent's (ego) network contacts (their alters). Egonet methods ask the respondent to identify (by anonymous first names or nicknames) the actual people in their social circle. With this specific identification the interviewer can then collect information about the demographics of these alters and information about the nature of the tie between ego and each alter.[2]

This information allows us to accurately map the details of a respondent's personal network.

Van der Gaag and Snijders did not itemize the actual contacts that were a respondent's sources of social capital. Thus if the same person were the source of different types of social capital, they would not pick this up.

The SCR name generator adds the detail of collecting specific names to the social resource questions. We thus collect information about the contacts through which these resources are (potentially) available. This combination of techniques is thus the basis of the 'social capital resource' (SCR) name generator. [3]

Although developed from a substantive perspective, the SCR name generator has the additional benefits of being a multiple question name generator. A multiple question name generator is very different from a simple name generator such as 'Who are the people close to you?' (See for example the classic study by Wellman, 1979.) This latter technique, often used because of its economy, invites the respondent to pre-sort the members of their social circle and then list them by priority. It thus involves a cognitive overlay from the respondent. Most importantly it does not allow for the same alter to be named in association with different relations as occurs with a multiple question name generator. The multiple questions of the SCR name generator thus allow us to pick up whether a respondent's access to social capital is concentrated in a few alters who provide multiple forms of social capital or, alternatively, whether the respondent draws different forms of social capital from diverse alters.

Multiple question name generators have been associated with the concept of multistrandedness. The classic formulation of the multiple question name generator technique was Claude Fischer's Northern California Community Study (NCCS)

(Fischer 1982; Fischer and Shavit 1995). As with any egonet study the basic piece of information is the size of ego's personal network, the number of alters named.

The responses from multi-question name generators also allow egonet researchers to assess a respondent's network embeddedness as a measure of multistrandedness. Multistrandedness[4] is simply the number of times an alter is, on average, mentioned in response to multiple questions. It is calculated by dividing the total number of names mentioned (i.e. *including* multiple entries of the same names) by the number of actual alters (i.e. *excluding* extra entries of the same names). If multistrandedness is high (say around 2.0) it suggests that a limited pool of alters supplies social capital of multiple kinds to ego. If it is near to 1 (since 1 is the lowest possible value), the respondent is drawing each social capital resource from different (contacts) alters.

The SCR name generator thus utilizes the social capital resource generator of Van der Gaag and Snijders in partnership with the multiple question name generator method of the NCCS-type studies.[5] It produces a profile of the social capital resources available to a respondent but also produces basic information about the size of a respondent's local (personal) network (the number of alters). These basic pieces of information, along with the measure of multistrandedness, provide crucial first indicators about the structure of personal network connections through which people (potentially) access social capital resources.

We now describe the SCR name generator and give a working example of it. We then report findings relating to social capital profiles from pilot projects utilizing the SCR name generator.

The social capital resource name generator: Example

Appendix A is an SCR name generator set out as a self-administered survey instrument. The respondent gives some basic demographic information ('About you'). They then write in the names of people who they know who would be able to help them with the tasks or issues nominated in a series of questions. They are instructed to make sure that each person they think of has a unique identifier but encouraged to enter a person's name as many times as appropriate.

At the bottom of the questions they count up the scores (number of alters) they nominate in each Domain. This enables them to assess the breadth of social capital resources they have. On the right hand side of the page they are asked to list all the people whom they have nominated and count up the number of times that each is mentioned. The index of multistrandedness is thus the total number of mentions (the second column) divided by the total number of names (the first column).

The social capital profile gives the scores (number of persons mentioned) for each domain. Scores across the four domains are an indicator of variability. Variability across domains is summarized by the standard deviation of the individual domain scores with respect to the mean score.

Here are three examples of individual (H, T and N) social capital profiles from one of our studies (Study D).

ID	Dom-I	Dom-II	Dom-III	Dom-IV	Mean Domain Score	St Dev
H	6	4	5	7	5.5	1.29
T	7	2	10	9	7	3.56
N	8	1	7	14	7.5	5.32

For the three cases the mean domain score is 5.6. Respondent H sits almost exactly on this mean. Moreover, his/her contacts are evenly spread; the standard deviation is

small. The other two cases have more contacts, i.e. higher mean domain scores, but variability (standard deviation) is greater. Respondent N has the greatest variability (5.32).

The egonet information generated by the SCR name generator is the number of alters (personal network size) and multistrandedness. Here are the calculations of multistrandedness for the same three respondents.

ID	Total Mentions	# of Alters	MultiStrandedness
H	22	11	2.00
T	28	13	2.15
N	30	20	1.50

There is no necessary relationship between multistrandedness and the social capital profiles. The multistrandedness tells us the arrangement of relations and alters around an individual. In this case we see that Respondent T and respondent N, although having similar social capital profiles have different multistrandedness. Respondent N tends to have separate contacts for his resources. Respondent T tends to draw multiple resources from a smaller pool of alters.

Report: Social Capital Profiles of young people

In this section we report some indicative findings on social capital profiles from 3 pilot studies.[6] The pilot studies used purposive sampling to produce cohorts of young people (20-25) and older people. Studies of people in their early 20s suggest that their social networks and networking activity are different from people in later stages of the lifecycle (Bidart and Lavenu 2005).

Study A was run on an older, professional group attending a professional training seminar. Study A adapted, with slight amendment, the questions of Study D. Study D is a study of young adults in their early twenties run by Daniel Chamberlain. Study A

and Study D thus allow for comparison of an older and younger group (although a couple of the participants in Study A were also under 25). The third study, Study K1, used the same SCR name generator on a cohort of younger persons and a cohort of older persons.

In Study A respondents were not asked the full set of questions required to elicit contacts in Domain I - Prestige and Education. We will exclude that entry (indicated by square brackets) in the comments that follow.

Table One: Social Capital Profiles (Aggregated cases): Study A, D and K1

	Dom I *Prestige & Edu'n*	Dom II *Politics & Finance*	Dom III *Personal Skills*	Dom IV *Personal Support*	Mean Domain Score	Mean of St. Dev.
A	[3.62]	5.15	4.31	5.92	4.75	1.63
D	6.90	2.80	4.20	8.50	5.60	3.18
K1-Old	13.56	5.67	11.78	25.11	13.82	10.07
K1-Young	10.00	5.75	12.50	27.75	12.10	14.00

The pattern in all studies is for Domain IV, *Personal Support*, to have the highest number of mentions. Domain I, *Prestige and Education*, comes next (although not for Study A) while Domain III, *Personal Skills* is higher than Domain II, *Politics and Finance* except for the Study A respondents. It seems probable that older, professional people will have more access to Domain II social capital than younger people.

Study K1 involved 17 respondents from a random (shopping mall) population sample. It excluded anyone aged 30-39 years. It thus had 8 cases of people aged 23-29 and 9 of people aged 40-52. Study K1 used a longer list of SRC name generator questions than Study A and D. The number of alters named in Study K1 is therefore more than in Study A and D (see below). However the distribution of alters across the four

domains of social capital confirms the differences between younger and older cohorts suggested by Studies A and D.

All three studies suggested that differences between younger and older people run in the same direction. Younger and older people reported about the same number of alters. However, young people have a greater variability in the spread of social capital resources. This is reflected by the standard deviations which, on average, are greater for Study D respondents than Study A respondents and were higher among the young cohort of Study K than among the older cohort. This effect stems largely from the smaller number of contacts younger people report under the *Politics and Finance* domain of social capital. Whether this means that young people actually have less contacts in this domain or whether they simply do not regard these contacts as significant is a subject that we will pursue with further qualitative questioning.

Report: Network size and multistrandedness

Since it is an egonet survey using a multiple question name generator, the data from the SCR name generator can be set against the benchmarks for the US and Israel reported by Fischer and Shavit (1995). As well as Study K1, mentioned above, two additional pilot studies (Study C and Study K2) used the SRC name generator and aligned it with the questions of Fischer's original NCCS survey. Although the number of SCR name generator questions varied, we thus had 6 cohorts (studies A, D, K1-Young, K1- Old, C and K2) from which to compare the mean size of personal networks (numbers of alters) and multistrandedness with the Fischer and Shavit benchmarks. In addition to mean values we also calculated the median values. The median values serve as a check on the mean. If a small sample has a skewed

distribution then the mean and median will not align. This did not occur in any of the data reported below.

Table Two presents the calculations of network size and multistrandedness for the benchmark studies and all the pilot studies. Studies A and D found about 15 alters on average close to the benchmark figures as were Study K1-Old and K2. The younger cohort of study K1 reported over 20 alters on average as did the respondents for Study C.

Table Two: Network Size and Multistrandedness: Study A, D, K1 C and K2 compared to NCCS and Haifa benchmarks.

Study	NCCS	Haifa II	A	D	K1-Old	K1-Young	C	K2
Number of Respondents	800	262	13	10	8	9	8	8
Number of Alters (Mean)	18.4	14	14.7	15.3	16.3	21.6	21.9	16.0
MultiStranded-ness (Mean)	1.7	1.5	1.3	1.6	3.2	2.8	1.6	2.0
Number of questions asked	9	9	7	4	12	12	10	8

The multistrandedness of respondents in Study D (young people) was 1.6, about the same as the Fischer and Shavit benchmark, but lower than Study A. Study D is close to the benchmark but Study A is below. This means that the older, more professional respondents of Study A garnered social capital resources from a wider range sources. Age does not seem to be the significant factor however. Across the other studies (K1-both groups, C and K2) the multistrandedness index tended to be higher than the bench marks and it was highest (above 3) among the K1-Old cohort.

The figures for network size suggest that younger people will nominate a larger number of alters than older people. These pilot studies do not suggest any age patterns regarding multistrandedness however, although occupational factors may be at play.

The impact of the number of name generator questions

The 5 pilot studies discussed in the last section used different numbers of name generator questions although none used more than 12. A separate aspect of study K2 investigated the impact of using more questions on the number of names generated and the index of multistrandedness. Since name generator questions are designed to be prompts to aid a respondent's recall, we would expect that more questions will produce more alters. At the same time however the respondent is more likely to repeat names.

Study K2 asked respondents the full array of 32 questions used by Van der Gaag and Snijders (2005). 9 of these questions were the 9 questions of the NCCS study. (These nine questions were the basis of the size of network and multistrandedness data reported in the last section.) Responses to the larger set of set of 32 questions allowed us to examine the impacts flowing from asking increased numbers of name generator questions. This change affected the number of alters named and the index of multistrandedness.

The results from this pilot study (K2) confirmed that both the number of alters named and the index of multistrandedness increase as the number of name generator questions increases. It may be possible to further analyze this data to see if there is some asymptotic trend that suggests a final limit as was suggested by Bernard et al. (1990) in their use of similar exhaustive questioning strategy.[7] For the purposes of this paper, however, this pilot study suggests measures of network size and

multistrandedness are more heavily affected by the number of questions used in a name generator than by the specific content of the questions. This was the effect we also noted with study K1 as compared to Study A and D.

This suggests that estimates of the absolute size of egonet networks will be critically affected by the number of questions asked. Same size banks of questions make sense for generating relative comparisons of network size between populations, as Fischer and Shavit did, but they cannot produce good estimates of the absolute size of personal networks in different populations.

Concluding comments

The SCR name generator combines the differentiated content of social capital resources identified by Van der Gaag and Snijders with the precise mapping of personal networks of egonet methodology. We have argued that this provides a tool for understanding the utilisation of social networks in the generation of social capital at the individual level. Mapping social capital profiles, assessing the size of personal networks and multistrandedness allow for comparison of individuals or cohorts to each other and to population means and can be supplemented by qualitative investigation of particular cases. Our pilot studies showed both the ease of use of the SCR name generator and the usefulness of the information it produces.

We have reported some initial findings suggested by case studies of younger and older cohorts. Social capital profiles suggest patterns of difference, with younger people having greater variability across the domains of social capital. There is some suggestion that network size seems to be higher among young people but there was no pattern in the levels of multistrandedness.

We conclude with a strong recommendation for social capital research to make use of the SCR name generator to investigate the direct connections between social networks and social capital. Conversely, we recommend that egonet methodology can fruitfully pay more attention to the substantive content of name generator questions as we did with the social capital domains.

References

Barabasi, A.-L. (2002). Linked : the new science of networks. Cambridge, Mass., Perseus Pub.

Bernard, H. R., E. C. Johnsen, et al. (1990). "Comparing four different methods for measuring personal social networks." Social Networks **12**(3): 179-215.

Bidart, C. and A. Degenne (2005). "Introduction: the dynamics of personal networks." Social Networks; The Dynamics of Personal Networks **27**(4): 283-287.

Bidart, C. and D. Lavenu (2005). "Evolutions of personal networks and life events." Social Networks; The Dynamics of Personal Networks **27**(4): 359-376.

Coleman, J. S., T. Hoffer, et al. (1982). High school achievement : public, Catholic, and private schools compared. New York, Basic Books.

Cross, R. L. and A. Parker (2004). The hidden power of social networks : understanding how work really gets done in organizations. Boston, Mass., Harvard Business School Press.

Field, J. (2003). Social capital. London ; New York, Routledge.

Fischer, C. S. (1982). To dwell among friends: personal networks in town and city. Chicago, University of Chicago Press.

Fischer, C. S. and Y. Shavit (1995). "National differences in network density: Israel and the United States." Social Networks **17**(2): 129-145.

Gilchrist, A. and Community Development Foundation (Great Britain) (2004). The well-connected community : a networking approach to community development. Bristol, UK, Policy Press.

Kilduff, M. and W. Tsai (2003). Social networks and organizations. London, SAGE.

Lin, N., Y.-c. Fu, et al. (2001). The Position Generator: Measurement techniques for investigations of social capital. Social capital : theory and research. N. Lin, K. S. Cook and R. S. Burt. New York, Aldine de Gruyter**:** 57-81.

Van Der Gaag, M. and T. A. B. Snijders (2005). "The Resource Generator: social capital quantification with concrete items." Social Networks **27**(1): 1-29.

Wellman, B. (1979). "The Community Question: The Intimate Networks of East Yorkers." The American Journal of Sociology **84**(5): 1201-1231.

APPENDIX: A self-administered SCR name generator

About You: Gender: Female.. Male …Year of birth: ……

Resource-Name Generator – Instructions

For each question write the first names or nicknames of people you know who could help you. If two people have the same name add something to tell them apart. Repeat names as often as necessary. For this exercise, to *know personally* means that you feel you know them well enough to trust that they will give you an honest response if you ask them about something.

Who are people you know personally that have travelled enough that they would be able to advise you about a trip to a difficult or unusual location? (e.g. Africa) …… ……		After you have finished write down the name of each person you have mentioned and count the number of times each one is mentioned.
Who do you know personally who could give you financial advice, perhaps about superannuation issues or ways to arrange your tax, investment and financial affairs? …… ……		
Who do you know personally who could give you advice about dealing with bureaucracies or government? …… ……		Person Mentions… …….. …….. …….. …….. …….. …….. …….. ……... …….. …….. …….. …….. …….. …….. ……..
Who do you know personally who could help with computer setup and installation in your home? …… ……		
Who do you know personally who speaks and writes a foreign language fluently? …… ……		
Who do you personally, (outside work and home) who could advise on interpersonal problems at home or work? …… ……		
Who do you know personally who would be able to help you move house? …… ……		Total Mentions.. Total Persons … Divide to calculate multistrandedness

Your Social Capital Resource Profile: (Score 1 for each name mentioned)

Domain One: (Q 1)……. Domain II (Q 2 and 3)…. Domain III (Q 4 and 5) …
Domain IV (Q. 6 and 7) ……. (How even is the spread?)

[1] Egonet methods are often overlooked in social network analysis (SNA). The origins of SNA in sociometry have left a legacy of focus on 'whole networks'. Whole network techniques lend themselves best to organizational analyses (see for example, Kilduff and Tsai, 2003 and Cross and Parker, 2004). The key to an egonet analysis is not the sampling method, it is the fact that it asks network-sensitive questions.

[2] Full egonet surveys go on to collect, from ego, their observations of all of the relationships between every pair of their alters. Alter-to-alter ties constitute ego's 'personal community' as opposed to the collection of ego-to-alter ties. Collecting alter-to-alter ties is very labor-intensive and was not used in the studies reported here.

[3] Although similar in some respects to the 'position generator' championed by Nan Lin (2001) the method proposed here is different in the crucial respect of still being a name generator in the classic egonet sense.

[4] The concept of multistrandedness described here is often referred to as multiplexity. We follow the usage of Fischer and Shavit 1995 since it suggests a measure of ties around ego. Multiplexity is often used to signal that two individuals have more than one relation (e.g. father and daughter may also be a teacher and pupil in a school). It is a property of a dyadic pair, not of a single person.

[5] The idea for combining these two forms of data collection was first suggested, and implemented in a student project by a student, Anna Duncanson, in an earlier offering of the final third year course in which the studies reported here were also done.

[6] Study A was conducted by Malcolm Alexander with attendees of the ACSPRI Winter School 2008 course; Introduction to Social Network Research and Network Analysis. Study D is Daniel Chamberlain's PhD research (AMC/09/06/HREC). Studies K1, K2 and C were conducted as student exercises for the Griffith University undergraduate course, 3033ART Social Networks, Community and Cooperation run in Semester 1, 2008. The data from studies KI, K2 and C are reported under the 'post hoc' provisions of the Griffith University ethics guidelines.

[7] Bernard et al. used 'reverse small world' name generator questions for their study. However it is the strategy of asking many name generator questions that is the key point of similarity.