Personal Networks as Social Capital: a Research Strategy to Measure Contents and Forms of Social Support

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Abstract:

The basic idea of social capital consists of the belief that individuals' lives can be qualitatively improved by social relationships, or rather by the social resources that these relationships manage to mobilize. So, personal networks can provide a kind of capital for individuals. This essay examines the characteristics of personal networks that mobilize social resources in a sample of 307 individuals, representative of the population of Verona (Italy). By using some structural indicators of social capital, the authors describe the contents and the forms of different kinds of social circles (family, work colleagues, members in third sector organizations, friends, neighbours). This study rejects a hypothesis according to which stronger ties are better vehicles for symbolic and expressive resources, and confirms a hypothesis on the similarity of the forms of different social circles that provide individuals with social support.

Keywords: Personal network, social capital, social circles, network closure, structural holes.

1. Introduction

The basic idea of social capital consists of the belief that individuals' lives can be made easier and be qualitatively improved by personal networks, or rather by the social *resources* that these relationships manage to mobilize (Hanifan, 1920; Jacobs, 1961; Bourdieu, 1986; Coleman, 1988).

In the field of structural analysis, the sociological importance of studying personal networks as social capital has recently been highlighted anew in the work of Bidart and Degenne (2005), Freeman (2004) and Wellman (1999; 2007). Personal networks arise from the actions of individuals, but at the same time condition these actions; so the networks represent both a constraint on and an emergent effect produced by the actions of individuals (Burt, 1982; Ferrand, 1997; Degenne & Forse, 2004). Under certain conditions, personal networks can represent a kind of capital for individuals; indeed, personal networks constitute a resource that an individual can decide to use in order to achieve a certain goal.

This essay presents an innovative research strategy to analyze personal networks as social capital in different social circles (family, work colleagues, members of third sector organizations, friends, and neighbours); following Flap (1999), Lin (2001), Forsé (1997), and Burt (1997a; 2009), this strategy allows us to study personal networks as relational contexts that can represent a social

support for individuals, providing them with some resource categories – *contents of social support* – through some morphological structures – *forms of social support*.

The essay is structured as follows: in paragraph 2 we will describe the theoretical background of our research strategy and we will state our hypotheses; in paragraph 3 we will present the methodology of research; in paragraphs 4 and 5 we will analyze and discuss the data obtained.

2. Theoretical background and hypotheses

The study we are presenting allows us to verify some working hypotheses drawn up in relation to two central theoretical themes that arose in the discussion of sociological theory on the link between personal networks and social capital. Social capital, which is embedded in an individual's personal relationships, depends on the structure of his/her network and corresponds to the possibilities for accessing it that the network itself supplies (Forsé, 1997).

Using this definition of social capital as a starting point, we will concentrate on the contents and forms of support networks[1]. The first theme we deal with is that of the contents of social capital, which can be conceptualized as social resources that provide individuals with social support (Flap, 1999). The link between personal networks, social capital and social resources has been considerably strengthened by Lin's work (Lin, 1982; 1983; 2001; Lin, Cook & Burt, 2001; Lin & Erickson, 2008a; 2008b). Lin uses the concept of social resource as the starting point for a rich vein of theoretical reflection and empirical research on social capital. According to Lin, a resource can be called 'social' if it is embedded in a social network. Social resources are not goods possessed by individuals – on the contrary, they are resources that can be accessed through direct or indirect social ties. The operationalization of social capital that Lin provides leads him to propose a strategy for measuring the phenomenon based on individuals' opportunities to draw on the social resources contained in the local network, regardless of the results that the use of said resources leads to. Studying the social capital of an individual means being able to piece together the map of the various resources that (s)he can effectively mobilize as a form of support.

In order to calculate the quantity of different resources that circulate within a specific personal network, it is a good idea to concentrate exclusively on some categories of resources that are general enough to allow us to use them also in relation to individuals who have very different characteristics from each other (see Van der Gaag & Snijders, 2004; 2005; Van der Gaag, Snijders & Flap, 2008). The first knot we aim to unravel for our operationalization of the concept of social capital is the issue of social resources, *i.e.* resources an individual can access through one or more social connections. We have compiled a sufficiently general list of contents to gather information about social resources; the list is also in line with the ideas that emerge from an analysis of the most recent literature on this subject (Van der Gaag & Snijders, 2005; Burt, 1997a; 2005; 2009; Donati, 2007; Tronca, 2007; Lin & Erickson, 2008a; 2008b). The list of social resources includes:

(1) *material resources* (*alter* has provided or can provide *ego* with money, goods, etc.);

(2) *reputation* and *social credentials* (the fact that *ego* knows *alter* has increased or can increase the standing and respect that *ego* receives from others and therefore the chances of reaching his/her goals);

(3) *contacts* and *inter-person acquaintances* (*alter* has introduced or can introduce *ego* to people who can help him);

(4) *symbolic and expressive resources* (sharing of the most appropriate strategies for achieving goals, *i.e.* advice, moral or psychological support, reassurance, the chance to let off steam, etc.).

Studying the social capital of an individual means being able to piece together the map of the various resources that he has mobilized or can effectively mobilize as a form of support. Starting from the general theme of the contents of support relationships and using the important empirical evidence that has emerged from other studies (Granovetter, 1973; Lin, 2001) as our basis, we will attempt to understand if the data allow us to corroborate this traditional working hypothesis:

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[1] For a wider review of social capital definitions, see Ostrom and Ahn (2003), and Castiglione, Van Deth and Wolleb (2008).

Hypothesis 1 – *We hypothesize that stronger ties (family and friendship relations) are "good vehicles" for symbolic and expressive resources (company, advice, etc.), while networks made of weaker ties (colleagues, fellow members of third sector organizations) can more easily provide ego with the other categories of resources (material resources, reputation, and contacts)* (see par. 4.2).

The second theme we refer to is the form that personal networks take. For individuals, the different structural configurations of the networks able to mobilize support (in terms of social resources) also represent different forms of social capital. The studies that allow us to gather precious information and ideas on this subject are for the most part those carried out by Ronald Burt (1992; 1997b; 2000; 2005; 2009). Burt develops the concept of network location: according to the social capital metaphor, the people who get the best results when performing their activities are the people who are best connected. Therefore it is necessary to also consider the form of social networks as an element of social capital (Borgatti, Jones & Everett, 1998; Lemieux, 1999; Täube, 2004; Van der Gaag, Snijders & Flap, 2008). There are at least two different strategies for examining the idea of "best connection": (1) *the network closure strategy* (or bonding social capital strategy): the densest networks provide the individuals who form part of them with a large amount of social capital, as they guarantee direct and rapid access to information and increase the effectiveness of sanctions, therefore encouraging a tendency to place trust in other people (see also Lin, 1982; 1983; Walker, Wasserman & Wellman, 1994); (2) *the structural holes strategy* (or bridging social capital strategy): social capital is a function of the opportunities that a person has to play the role of broker within a personal network (which contains one or more structural holes); as a general rule, brokerage mechanisms are associated with growth and innovation dynamics (see also Lemieux, 1999; Täube, 2004; Dekker, 2006).

Using information obtained from previous studies on the issue of the form of social capital – we refer to Burt's works (1992; 2000; 2005; 2009) and we refer to some studies carried out both in the world of Italian schools (Tronca, 2007), and in a sample of individuals representative of the Italian population (Donati & Tronca, 2008) – we will try to confirm the following hypothesis:

Hypothesis 2 – *We hypothesize that the various social circles (family, work colleagues, members of third sector organizations, friends, and neighbours) which provide individuals with social resources tend to have the same form, if they are analyzed with reference to the same focal individual* (see par. 4.3).

To summarize, it is possible to try and obtain information on the *contents* of social capital thanks to a study of the relationships that a sample of *egos* (representative of large populations of individuals) has with the various *alters* who make up their personal support networks. At the same time, it is possible to also attempt a study of the *forms* of these networks. The different dimensions – content and form – of social capital will be identified based partly on which specific social circle the people who make up an *ego*'s personal support network belong to.

3. Method

In order to carry out our study, we created a probabilistic sample that would allow us to make the common techniques for studying sample groups compatible with social network analysis. By using this sampling strategy it was possible to study *ego-networks*, formed by a focal actor (the one found in the sample) called *ego*, a group of subjects called *alters* and by the ties that bind the various *alters* to *ego* and to each other. We created a sample that was representative of the population of Verona (Italy).

The sample was proportionally stratified by gender and age (adults from 18 to 65 years old) of the total population residing in the city on 1st January 2005, and comprises a total of 307 cases[2]. In the period between February and March 2007, the individuals selected for the survey were given a

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[2] The sample, with an estimated accuracy level of 95%, leads to a maximum sampling error of 5.6% in absolute percentage points for estimates on the total number of interviewees.

structured interview, complete with the *name generator* and *name interpreter* tools. The interview was conducted face-to-face. As well as information relating to the individual, relational data was obtained, thus allowing us to piece together the cognitive social structures of the interviewees (see Krackhardt, 1987; Wasserman & Faust, 1994). The interviewees gave the names of people (*alters*) who they have received or may receive help and support from in times of need (using the four categories of resources presented) and they also intimated whether they helped or may help these *alters*, and whether they believed that those people have a support tie between them.

We thus obtained an estimate of the perceived directed ties of support between a group of important others (*i.e.* a personal network) for each *ego*. For each *alter* we also gathered information on their individual attributes (gender, age, qualifications, employment status, profession/trade). Another piece of information obtained on each *alter* was about the social circles they belong to. The name interpreter is highly reliable if it is used to study local networks (Marsden, 2005).

The social circles that we identified are the following: family network; network of work colleagues; network of people met through third sector organizations; network of friends; network of neighbours (a similar division of relational contexts to the one we used can be found in Mollenhorst, Völker & Flap, 2008). Gathering this information allowed us to create sets of specific indicators for each social circle. To recapitulate, after using the name generator to generate a list of names, we used the name interpreter to gather information on: (1) the individual attributes of each *alter* (gender, age, etc.); (2) the frequency of contact between *ego* and *alter*; (3) the various contents of mutual support relationships; (4) to what extent there are mutual help and support relationships between all the *alters*[3].

The most widely adopted methodological structure for the study of the community networks of samples of individuals that can be related to wider populations was suggested by Wellman (2007) and is applied in a very similar way to the method we employed, in particular regarding the decision to analyze a number of the cognitive and community support networks from, among others, Widmer (1999; 2007), Widmer and La Farga (2000) and Degenne and Lebeaux (2005).

4. Results

4.1. Features of the sample

The sample, which is composed for the 50.2% of males, presents an average age of 42.72 years. Interviewees are distributed for the educational level as follows: primary school diploma 3.3%, middle school 34.3%, high school 43.5%, university 16.0%, post-grad qualification 2.9% (n = 306); and the average socio-economic status index is 4,45 (n = 307) within the range 0.5-10[4].

For our first explorative study of social support networks, we made use of the cluster analysis technique (hierarchical: Ward method), using the following as variables to identify the different groups:
- homophily based on gender (expressed as a percentage of the components of a personal network being of the same gender);
- the density of the network (percentage of the actors with reciprocal connections out of the total possible connections if all the nodes were in some way connected to each other)[5];
- the size of the personal network containing social capital, without dividing *alters* according to their social circles;
- the average age of the *alters*;
- the average socio-economic status of the *alters* (expressed as a score);
- the frequency of contact (the average number of times a week the *egos* speak to *alters*).

In reference to the variables listed above, the sample of interviewees is generally characterized by an average network size of 5.25 people (std. dev. = 2.74) who constitute the 'hard core' – the

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[3] For an analysis of this data collection strategy, see Burt (1997a), Marin and Hampton (2007), and Pustejovsky and Spillane (2009).
[4] The index combines educational and occupational levels.
[5] See the Appendix, par. 1.

active components of the support network and the rock the interviewee leans on. The networks also display a rather high density (70% of the members of each network have a reciprocal connection) and are relatively homogeneous to the interviewees (*egos*). In fact, in 63.9% of cases network members are of the same sex; the correlation between the social status of the interviewees and the figure obtained for the mean status within the network (0.54, $p < 0.001$), and between the age of *ego* and the ages of the members of the personal network (0.61, $p < 0.001$) is both strong and significant. On average there are more than 4 moments of contact a week (4.46).

Our explorative study allowed us to identify 4 clusters:

- Cluster 1: *the exclusive club*. This group contains 99 individuals (32.4% of the sample) who can be placed in a relational space distinguished by the low level of segregation according to sex (the percentage of gender homophily is the lowest of all: 44.7%), smaller than average (4.82 components, compared with the average figure of 5.25) and is made up of actors with the highest levels of social status (average score of 4.55 against an overall average score of 4.37), and of a generally higher age than the average age of the network components as a whole (49 years old against 47). This cluster displays a high density (75% of actors with reciprocal connections, against the 70% of the overall average) and the frequency of their contacts with *ego* is just a little higher than the overall average (4.5 against 4.4).

- Cluster 2: *the free time crowd*. This is the largest cluster (132 interviewees – 43.1% of the total) and is distinguished by a stronger and more marked separation according to gender (69% of the members of this network are of the same sex), a large size (the figure of 6.33 components makes it the broadest network of the whole sample), but on the other hand a low density (the lowest of all: 65% of the network members offer mutual help to each other) and a slightly lower number of weekly moments of contact than the average. The members of the network are around 47 years of age (this value represents the average age of the nodes of all the networks) and a low average status score (the lowest of all).

- Cluster 3: *the circle of close friends*. This cluster, which contains 62 cases (20.2% of the sample), displays a clear separation of the sexes (96% of its components are of the same sex), is of limited size (average size = 4.35, therefore lower than the overall average) and has a high density (72%). The components of this kind of network have the lowest average age of all the clusters (around 44 years old) and a higher average social status than the overall average (a score of 4.41 against 4.37). This cluster displays the lowest frequency of contact between network members.

- Cluster 4: *the quiet people*. Although this cluster is made up of a very small number of individuals (13, *i.e.* 4.3% of the total), the features of this group are so marked that we decided to keep it as a separate group. Indeed, in this particular cluster we find a very small (2.23 components) and very dense network (80% of members know each other – this is the highest percentage of all the groups), where members make contact with each other many times a week (the highest number of all the groups: 5); the components of this cluster are from the middle classes and slightly younger than the overall average age.

Table 1 The socio-cultural profile of the members of the four clusters

Cluster	Number of subjects in the cluster	Gender (mode in %)	Average age of the interviewees	Education score	Social status score[a]	Years living in Verona	Perceived safety of the area where they live	Pearson's correlation coefficient between the status score of interviewees and the status score of members of their network
1. The exclusive club	99	Males 51.5%	44.1	5.0	5.1	36	3.1	0.65 $p < 0.001$
2. The free time crowd	132	Males 50.8%	42.4	4.1	4.1	34	3.1	0.46 $p < 0.001$
3. The circle of close friends	62	Females 59.7%	39.9	4.2	3.9	33	3.2	0.59 $p < 0.001$
4. The quiet people	13	Males 76.9%	47.5	4.5	5.0	41	3.3	0.15 Not. Sig.
Total	306	Females 50.2%	42.7	4.4	4.4	35	3.2	0.54 $p < 0.001$

4.2. The contents of personal support networks

The first step of the analysis was to examine the distribution of the various forms of support within the sample. The concept of social capital involves the concepts of social resource (Lin, 1982; 1983) and social support (Sarason, Sarason & Pierce, 1990; Lin, Dean & Ensel, 1986), which were studied separately in the research carried out in the 1980s and '90s[6]. Our study, however, analyzed social capital by breaking down the types of support that social capital can mobilize in order to explore its distribution among the population and to verify what differences there are between the different types of social circles in mobilizing social resources.

Table 2 Average values of the percentages of members of the network whose help comes from in terms of…

	Mean	Std. Dev.	n
Material resources	92.33	17.44	306
Reputation	54.11	42.17	306
Contacts	66.33	36.28	306
Symbolic and expressive resources	92.44	19.49	306

As we can see in table 2, *egos*' personal networks mobilize mainly material resources (money, material goods) and symbolic resources (advice, moral support). In comparison, much less recourse is made to the network in order to gain support in terms of social reputation or to reach other people (contacts). Therefore there seems to be a clear polarization of the different types of resource. It is difficult to establish a convincing explanation of this phenomenon based on empirical observation. We will attempt to address this issue by observing any socio-cultural differences that emerge between our actors or within the different types of network. By analyzing the variance and correlations between variables, one can see some patterns emerge (table 3).

First of all, it emerges that the interviewees' age is a variable linked to material aid; in fact, in the two age groups that cover the range between 18 and 34, the average percentage of material help is higher than the other age groups, which display a progressive reduction in the percentage of this kind of help as age increases. Young people are certainly those that depend the most on the material resources provided by their families and by other social support networks. Another interesting fact concerning age is that the interviewee's age group has a significant link to the support in terms of contacts. In this case the 25-34 age group makes most use of this form of support. We can suppose that, as this is the age group that is most involved in the search for professional employment, it is the group that is most in need of contacts and acquaintances that facilitate entry into the world of work.

The data are not surprising and confirm the common-sense predictions about which groups have more or less need of the various kinds of support at different stages in life, and their subsequent recourse to their social networks to find a response to these needs. Resources of the symbolic kind, however, tell a different story, as they appear to cut across all social conditions and ages. If all this is true for the socio-demographic data, things change for the socio-cultural variables such as political orientation, levels of religious practice, or how often interviewees read newspapers or use the Internet. These factors do not seem to have a significant influence on the degree to which the four kinds of social support are "exploited" within a personal network. From this we can conclude that belonging to and internalizing a certain socio-political and religious culture do not influence the quality of the social support contained within the networks an individual belongs to.

Let us now examine whether the different social circles the individual forms part of display any kind of specialization regarding the structure and the kind of support they provide. Table 4 shows that the network most "specialized" in providing material resources is the family network, followed by friends and – a distant third – colleagues. On the other hand, for all other types of resource, it is fellow members of the interviewee's third sector organization who display the greatest willingness to provide help. Therefore, if we leave out the family sphere, which is the provider of material sup-

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[6] However, there are notable exceptions. Lin's studies (1983; 1986; 1999; 2000) are interesting, as are those carried out by Van der Gaag and Snijders (2005); Van der Gaag, Snijders and Flap (2008).

port *par excellence*, in all other cases it is participation in the life of an third sector organization and investment in that relational context that is the principal source of social capital. The third sector organization network is able to mobilize a proportionally greater percentage of help. Perhaps we could argue that involving oneself in a third sector organization is a sound investment in terms of social capital. With an average value of 77%, third sector organizations are the ones that offer the greatest opportunity to get to know charismatic people and people with the "keys" to certain social spheres compared with all the other relational spheres. As far as reputation is concerned, not only third sector members (57%) but also family groups (55%) and circles of friends (55%) make a significant contribution to the construction and maintenance of the interviewees' social standing.

Table 3 Percentage of members of the network willing to provide help (means)

Independent variables		Help in terms of:				
		Material resources	Reputation	Contacts	Symbolic and expressive Resources	n
Age groups		F=3.14*	F=0.27	F=2.44*	F=0.54	
	18-24	95.5	54.5	61.5	92.6	31
	25-34	96.8	56.8	77.4	94.0	67
	35-44	93.2	56.3	64.6	89.8	76
	45-54	90.5	51.9	66.8	93.9	61
	55-65	87.2	50.8	59.3	92.3	71

Note: F is an Anova statistic. The latter figure is followed by * if $p < 0.05$ or ** if $p < 0.01$.

Table 4 Percentage of members of the network willing to provide help, divided according to type of social circle and of resource (means)

Help in terms of:	Type of social circle				
	Family (n = 287)	Colleagues (n = 110)	Third sector mbrs. (n = 40)	Friends (n = 241)	Neighbrs. (n = 65)
Material resources	95.1	82.4	80.0	91.9	76.9
Reputation	55.5	49.8	57.7	55.4	34.6
Contacts	67.0	66.2	77.5	71.0	54.8
Symbolic and expressive resources	92.0	94.0	94.4	94.1	88.5

The situation is more even if we examine the number of nodes in the network that provide advice and profound support (symbolic/expressive resources). Members of third sector organizations, colleagues and friends reach average values of 94%, while family members and neighbours have slightly lower values. Although family and third sector organizations are the categories that dole out most resources (material resources from family and contacts, reputation and advice from members of third sector organizations), the study also states a fact that cuts across all the forms of support: neighbours are the group that offer the least support of all. In every category of support, the average value reached by neighbours is lower than all the others. This confirms that the neighbourhood circle is the one that has suffered most from the process of modernization in community networks and now "struggles" more than the others to provide support.

These results cast a partial doubt over the theory that networks with weaker ties principally convey reputation-enhancing or contact-building resources. From these data, the need to adopt another distinction seems to arise: distinguishing between networks of the elective kind and those of the ascriptive kind. The second hypothesis is then not confirmed.

4.3. The forms of personal support networks

It seems rather evident, as Burt (2009) has explicitly stated, that it is not possible to consider *network closure* and *structural holes* as the opposite ends of a continuum that goes from a mini-

mum to a maximum of social capital. Conversely, what they are is two different features of the purely formal dimension of the concept that lend a kind of structural duality to it; however, despite their essential difference, there seems to be a deep bond between them.

As has been suggested by Borgatti, Jones and Everett (1998), Degenne and Forsé (2004) and Burt (2000; 2009) we need to use measurements that will allow us to describe the structural position of an *ego* and also the other members of his/her networks, in terms of not only their direct relationships but also the indirect ties between them. This will stem from the calculations used to quantify the level of network closure in each *ego*'s network. The following indices establish a directly proportional relationship with this figure:

(1) the *ego-centric density* of the whole support network index (Δ_e): this figure represents the ratio between the active ties and those that could potentially be activated within a group of subjects and ranges from 0 (completely disconnected graph) to 1 (completely connected graph); the peculiar feature of ego-centric density is that it does not take the *ego* and its support links (whether providing or requesting support) with the members of its network into account, therefore this measurement tells us to what extent support networks are connected and cohesive, independently of the links with the *ego* that allows us to identify them (Scott, 1991)[7]. Five density indices were also calculated in relation to the different social circles the personal support networks are divided into (Δ_F, Δ_C, Δ_{TS}, Δ_{FR}, and Δ_N).

(2) The *aggregate constraint* exercised on *ego* by the whole support network (C_{eW}): this calculation shows *ego*'s degree of involvement in the support links with certain *alters* who are linked to each other by the same kind of bond. The figure obtained expresses *ego*'s level of dependence on others. If *ego* has many contacts who are isolated from each other the figure is 0, while if *ego* has only one contact it is 1 (Burt, 1992)[8]. Five aggregate constraint indices were also calculated, one for each of the different social circles, including the parts of social support networks identified with the different circles subjects belong to (C_{eF}, C_{eC}, C_{eTS}, C_{eFR}, and C_{eN}).

Other measures linked to network closure that we can use are those relating to *hierarchy*. These tend to be useful for calculating to what extent the constraint imposed on *ego* by its complete network depends on either few (strong constraint hierarchy) or many (weak hierarchy) others. These measures do not constitute a direct network closure indicator, but they do allow us to describe the strength of the hierarchy; this is why the following measurements will be analyzed: (i) hierarchy (H_{eW}): as has been said, this is the degree of hierarchy within a support network and it allows us to calculate how far the aggregate constraint imposed on *ego* depends on few ties (minimum 1: $H_{eW} = 1$) or alternatively on all the support relationships it is involved in ($H_{eW} = 0$)[9]; (ii) 5 hierarchy indices, one for each of the different social circles (H_{eF}, H_{eC}, H_{eTS}, H_{eFR}, and H_{eN}).

The quantity of structural holes bridged by *ego*, on the other hand, is measured directly by the following indicators:

(1) the effective size of *ego*'s network (NR_{eW}): this measure allows us to find the number of *alters* that an *ego* is connected to, minus the average score (in other terms the level of connection) of the various *alters* that form part of the support network, not counting the ties with *ego*; this measure allows us to understand how many non-redundant support relationships *ego* has and therefore to understand if this *ego* is able to bridge structural holes[10]. An effective size of *ego* index was calculated for each of the five social support circles (NR_{eF}, NR_{eC}, NR_{eTS}, NR_{eFR}, and NR_{eN}).

(2) Efficiency of *ego* index (ER_{eW}): with this measure we acknowledge the portion of non-redundant ties within the totality of *ego*'s relationships; the figure is obtained by dividing NR_e by the number of ties *ego* has[11]. Five efficiency of *ego* indices were obtained, one for each of the five social circles that provide support (ER_{eF}, ER_{eC}, ER_{eTS}, ER_{eFR}, and ER_{eN}).

Let us begin with our examination of network closure (see table 5). The ego-centric density of the whole support networks is naturally lower than the figure obtained for the simple density (see par. 4.1). Nevertheless, this average value (0.50) testifies to the significant degree of interconnection between the different support network zones: this interconnection is not guaranteed, however,

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[7] The formula for calculating the density is given in the Appendix, par. 1
[8] For the formula, see the Appendix, par. 2.
[9] For the formula, see the Appendix, par. 3.
[10] For the formula, see the Appendix, par. 4.
[11] For the formula, see the Appendix, par. 5.

by *ego*'s brokerage. The level of aggregate constraint (referring to complete support networks) also has an average value that stays around the 0.5 mark and is also associated with the tendency towards a reduced degree of hierarchy within the networks. Finding high levels of constraint in family networks may not surprise, but the even higher levels of average aggregate constraint found in the support networks made up of work colleagues, members of third sector organizations and neighbours are certainly worthy of note. Where present, highly contextualized support networks are therefore also highly cohesive and represent not only an opportunity, but also a constraint for the people who form part of them: exclusivity seems to be the price to pay for the construction of an interactive structure able to guarantee that trust will circulate within the group and the trustworthiness of the members of the network will be certified. The average aggregate constraint recorded for friendship social circles, although still rather high, is a slightly lower figure. Despite theoretically being the least contextualized of the networks in question, individuals in friendship networks still pay a hefty price in terms of network closure and exclusion in order be guaranteed support and help in times of need. Although we did not use them as direct indicators of network closure, the hierarchy indicators can also be used to help us understand in what way the support network changes when the social circle it refers to undergoes a mutation. The circles where network cohesion, and, in the end, the circulation of support that this kind of form guarantees (faster, more efficient and more closely connected to ties based on interpersonal trust between all the members of the network), appears to be most closely tied to the presence of one or few actors (other than *ego*) are the circles made up of neighbours and colleagues (at work or in third sector organizations). This means that in these relational contexts, whether there are support relationships or not is closely connected to whether there is someone who can perform the role of broker and facilitator in building social ties. The family and friendship networks, on the other hand, display a much weaker hierarchy in their support ties: the average degree of constraint exercised by these structures on *ego* is not lower, it is simply less closely tied to whether one or more individuals are more central than others or not.

Table 5 Structural indicators of social capital (means)

|			Network closure				Structural holes			
		Min	Max	Mean	Std. Dev.		Min	Max	Mean	Std. Dev.
WHOLE PERSONAL SUPPORT NETWORK (n = 306)	Δ_e [a]	0	1	0.50	0.34	NR_{eW}	1	14.56	3.16	2.13
	C_{eW}	0.18	1.12	0.56	0.24	ER_{eW}	0.12	1	0.61	0.25
	H_{eW}	0	1	0.08	0.20					
FAMILY (n = 287)	Δ_F	0.50	1	0.98	0.08	NR_{eF}	1	4.33	1.10	0.36
	C_{eF}	0.33	1.12	0.92	0.17	ER_{eF}	0.14	1	0.53	0.29
	H_{eF}	0	1	0.23	0.42					
COLLEAGUES (n = 110)	Δ_C	0.50	1	0.96	0.11	NR_{eC}	1	3.50	1.15	0.42
	C_{eC}	0.33	1.12	0.97	0.17	ER_{eC}	0.2	1	0.81	0.26
	H_{eC}	0	1	0.56	0.50					
MEMBERS OF THIRD SECTOR ORGANIZATIONS (n = 40)	Δ_{TS}	0.65	1	0.97	0.09	NR_{eTS}	1	2.75	1.10	0.35
	C_{eTS}	0.50	1.12	0.97	0.16	ER_{eTS}	0.19	1	0.83	0.27
	H_{eTS}	0	1	0.65	0.48					
FRIENDS (n = 242)	Δ_{FR}	0.08	1	0.86	0.20	NR_{eFR}	1	5.50	1.54	0.90
	C_{eFR}	0.20	1.23	0.83	0.27	ER_{eFR}	0.20	1	0.81	0.26
	H_{eFR}	0	1	0.38	0.48					
NEIGHBOURS (n = 64)	Δ_N	0.60	1	0.97	0.11	NR_{eN}	1	3	1.12	0.38
	C_{eN}	0.50	1.12	0.96	0.17	ER_{eN}	0.20	1	0.87	0.24
	H_{eN}	0	1	0.66	0.48					

[a] Ego-centric density.

Key: Δ_e, Δ_F, Δ_C, Δ_{TS}, Δ_{FR}, Δ_N: density indices; C_{eW}, C_{eF}, C_{eC}, C_{eTS}, C_{eFR}, C_{eN}: aggregate constraint indices; H_{eW}, H_{eF}, H_{eC}, H_{eTS}, H_{eFR}, H_{eN}: hierarchy indices; NR_{eW}, NR_{eF}, NR_{eC}, NR_{eTS}, NR_{eFR}, NR_{eN}: effective size indices; ER_{eW}, ER_{eF}, ER_{eC}, ER_{eTS}, ER_{eFR}, ER_{eN}: efficiency indices.

The actors who manage to play a brokerage role will be those who have the greatest ability to develop various different strategies for gaining support and therefore create a situation of competitive advantage over the *alters* in their network. With an average number of support relationships totalling 5.25 (see par. 4.1), the average effective size is 3.16. This fact was naturally foreseeable given the high levels of aggregate constraint recorded; a measure of the relationship between effective size and simple size is provided by calculating the relational efficiency of the network (0.61). If we move onto the individual support circles, the average effective size drops drastically and falls into a range of 1.10-1.54. Values of this kind are, however, linked to high levels of efficiency in the majority of the individual social support circles. What we would most like to underline is that the least efficient social circles are generally family circles. This fact supplements what emerged from the examination of the densities and levels of aggregate constraint: family networks are the most cohesive and have the greatest number of redundant support relationships of all, therefore they tend to be the least varied and innovative in terms of support strategies.

Our study ends with the proposal to carry out a further study in order to corroborate the third research hypothesis that holds that individual interactive practices produce a sort of conservation of the structure of personal support networks in their passage from one social circle to another.

Figure 1 MDS among the formal social capital indicators relating to the family (F) and friendship (FR) social circles
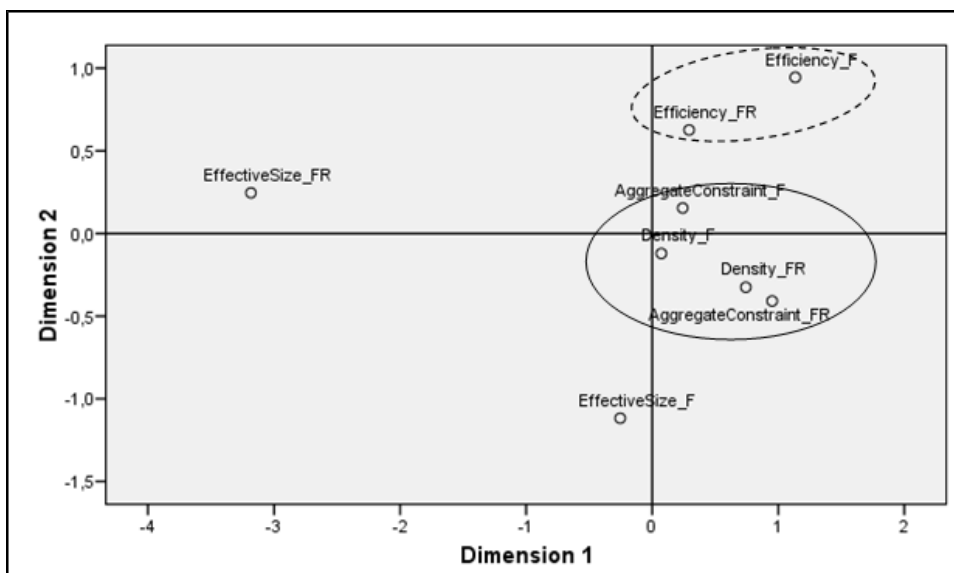
Note: *S-Stress* = 0,098; *Rsq* = 0,983; n = 224.

In the attempt to prove this hypothesis, we can make use of a multivariate analytical model: multidimensional scaling (MDS). This will allow us to identify any latent aspects subtended to groups of variables. MDS measures the relationships between different objects (variables) and process the data, arriving at the representation of networks similar to each other and arranging them in the Cartesian coordinate system, after calculating the Euclidian distances from an analysis of their correlation to each other (Takane, Young & De Leeuw, 1977). The sizes inputted into the model are the indicators of social capital structure pertaining to the family and friendship networks: the hypothesis can be corroborated by seeing whether there are of areas where the indicators of the same structural shapes but different relational contexts show similarities. The decision to concentrate on these social circles was based on some different reasons: (i) the family circle is the most ascriptive of all the circles examined, while the friendship circle is the most elective, in fact in our analysis only people who were not also workmates, fellow members of third sector organizations or neighbours were counted as "friends"; (ii) in the national study mentioned above (Donati & Tronca, 2008; see par. 2), despite it not being a structural analysis, the connection between the structure

of the social capital coming from the family and the structure of social capital in the wider community, *i.e.* referring to the more elective social relationships experienced by individuals, emerged clearly; (iii) the data gathered on the family and friendship support circles show the greatest number of cases with valid values of all, this becomes extremely important when the maximum number of cases available is just 307.

In figure 1 the graphic representation of the model applied is shown, as well as the indicators that confirm its validity. The model seems basically clear from the point of view of its contents. If we exclude the effective size, which, as will be remembered, finds its highest number in the friendship group compared with the other clusters, the result of applying the multidimensional analytical model basically confirms the hypothesis on the conservation and reproduction of the structure of social capital in the passage of individuals from the family circle to their circle of friends. As the elliptical figures given in figure 1 show, it is clear that a cluster can be identified by examining the relationship between the network closure indicators relating to the two distinct social circles for support (continuous-line ellipse). Likewise, it is clear that there is a cluster among the efficiency indices (structural holes indicators) relating to the two contexts. Therefore, social actors tend to receive support from friendship circles that generally have the same levels of structural closure and structural efficiency as family support networks. What emerges here is most likely further proof of the autonomous influence exercised by the form of social networks on individuals' actions (Freeman, 2004; Burt, 2009).

5. Discussion and conclusion

Our study has shown that the classic structure variables, useful for pinpointing the distribution of the nodes in the networks, play a different role depending on the socio-cultural profile of the members of the different clusters. As we have seen, for the purposes of producing social capital, gender similarity and the size of a network play different roles when the subject comes from the upper or lower classes, is a man or a woman, or is a young person as opposed to an adult or an elderly person. Gender homophily is a factor in strengthening support networks among young people, and in particular for women – compensating their less frequent meetings – while it becomes an indicator of a more traditional and "contextualized" style of relationship for the lower classes, who form part of networks that are large but have low density and therefore may mobilize little support. The explorative study has shown that the differences between the clusters can be traced back not only to subjective and individual variables, but as much as, if not more so, to variables relating to the social class and the behaviour strategies of the groups the interviewee belongs to.

With respect to the contents of social capital, in the course of the analysis we also discovered the polarization between material and symbolic/expressive resources on the one hand and social contacts and reputation on the other. For the most part, social networks were perceived by the interviewees as vehicles of the first two types of resource as opposed to the other two. The more ascriptive and traditional networks (such as family and neighbours) help mainly material resources to circulate, while the acquisitive and elective networks (friends, members of third sector organizations, work colleagues) more easily convey resources of a symbolic/expressive kind (psychological support, advice, strategies for action, etc.). This means that, despite social networks undergoing a process of modernization at the moment – a process which is seeing the elective character of primary relationships (typical of friendship networks and membership of third sector organizations) come to the fore – these networks do not lose their characteristics as deposits for symbolic resources such as advice, psychological support, etc.

Lastly, as far as the forms of social capital are concerned, it would be a good idea to underline how the most cohesive personal networks, and those with the greatest quantities of redundant relationships, are family networks. Although some differences between the various social circles arise, network closure is the prevailing structure for the networks examined and our analysis of the data shows that one of the links between ascriptive and acquisitive networks is that the form of these support networks remains basically unchanged in the passage of individuals from the family circle to their circle of friends.

APPENDIX

In this Appendix we expound the strategies used to obtain the structural indices used in the main text of the study.

1. Density indices. Density is calculated as follows in the directed graphs (*i.e.* obtained from directed ties) (Wasserman & Faust, 1994):

$$\Delta = L \,/\, g(g-1) \qquad [1]$$

where L = number of arcs (directed ties) and g = number of nodes (members of the network). Density varies from 0 (completely disconnected graph) and 1 (completely connected graph). In the text, with Δ_e we refer to ego-centric density in reference to the whole support network, while with Δ_F, Δ_C, Δ_{TS}, Δ_{FR}, Δ_N on the other hand we refer to the density of the various social support circles – to the circles made up of family members, colleagues, fellow members of third sector organizations, friends and neighbours respectively.

2. Aggregate constraint indices. The total constraint (C_i) that weighs on a subject i is expressed as (Burt, 1992; Degenne & Forsé, 2004):

$$C_i = \sum_j c_{ij} \qquad [2]$$

where c_{ij} expresses the level of constraint exercised on i by j and is expressed as:

$$c_{ij} = \left(p_{ij} + \sum_q p_{iq} p_{qj}\right)^2 \qquad [3]$$

with $j \neq i$, q and where (as in the example for values of p):

$$p_{ij} = (z_{ij} + z_{ji}) \,/\, \sum_q (z_{iq} + z_{qi}) \qquad [4]$$

with $i \neq q$ and where the z_{ij} type values are obtained from the Z matrix (which derives from the input matrix; the values it contains represent the strength of the relationship between points i and j, considered precisely in that order: see Burt, 1982, chap. 2). If C_i is 0, i has a lot of contacts isolated from each other; if C_i is 1, i has only one contact. We used the expression C_{eW} to refer to the constraint exercised on *ego* by the support network as a whole, and the expressions C_{eF}, C_{eC}, C_{eTS}, C_{eFR} and C_{eN} to express the levels of constraint exercised on *ego* by each of the various social circles.

3. Hierarchy indices. The hierarchy index, created using Coleman and Theil's inequality index (Coleman, 1964), is calculated for a subject i as follows (Burt, 1992):

$$H_i = \frac{\sum_j \left(\dfrac{c_{ij}}{C_i/N_i}\right) \ln \left(\dfrac{c_{ij}}{C_i/N_i}\right)}{N_i \ln(N_i)} \qquad [5]$$

where N_i is the number of ties i has. If H_i is 0, i receives the same level of constraint from each of his/her contacts; on the other hand, if H_i is 1 the constraint exercised on *ego* is provided by a single actor. For the hierarchy exercised on *ego* by the support network as a whole we used the expression H_{eW}, while for the hierarchy exercised by the various social circles we used the following expressions: H_{eF}, H_{eC}, H_{eTS}, H_{eFR}, H_{eN}.

4. Effective size indices. Using the values contained in the Z matrix (Burt, 1982, chap. 2), the effective size (non-redundant ties) of a subject i's network is calculated as follows (Burt, 1992):

$$NR_i = \sum_j \left(1 - \sum_q p_{iq} m_{jq} \right) \qquad [6]$$

with $q \neq i, j$ and where:

$$p_{iq} = (z_{iq} + z_{qi}) \,/\, \sum_j (z_{ij} + z_{ji}) \qquad [7]$$

with $i \neq j$ and:

$$m_{jq} = (z_{jq} + z_{qi}) \,/\, max(z_{jk} + z_{kj}) \qquad [8]$$

with $j \neq k$. If NR_i is 1, all of i's contacts are closely linked to the other contacts; if the effective size coincides with the size of i's network this means that the members of his/her network have no relationship with each other. In the text we used the expression NR_{eW} to refer to the effective size of *ego* in relation to the whole support network, and the expressions NR_{eF}, NR_{eC}, NR_{eTS}, NR_{eFR} and NR_{eN} for the effective size of *ego* within the various social support circles.

5. Efficiency indices. These indices were calculated using the effective size indices as a starting point. The relational efficiency of a subject i's network is calculated using the following formula (Burt, 1992; Degenne & Forsé, 2004):

$$ER_i = NR_i \,/\, N_i \qquad [9]$$

where N_i is the number of ties i has. In the text, ER_{eW} is used to mean the efficiency of *ego* in relation to his/her support network as a whole, while the expressions ER_{eF}, ER_{eC}, ER_{eTS}, ER_{eFR}, and ER_{eN} were used to represent the efficiency of the different social circles.

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