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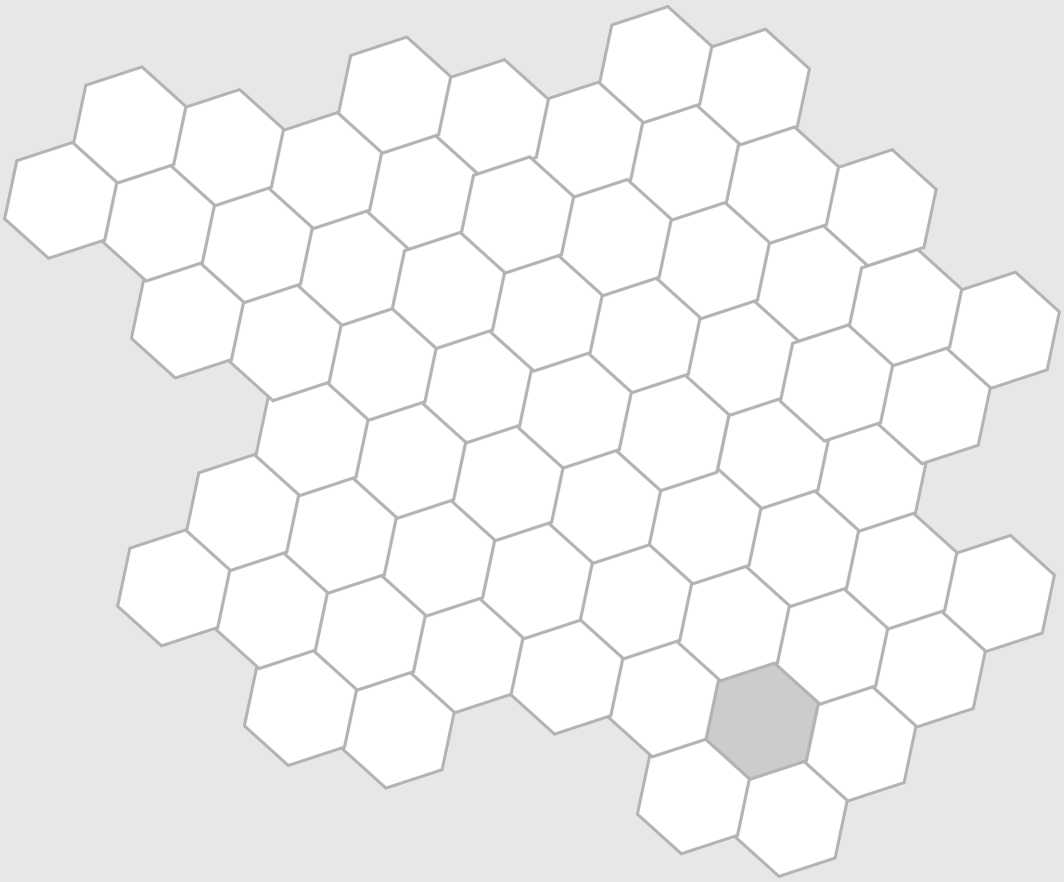

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Do Central Players Perform Better?

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Abstract

Social Capital, the outcome for individuals from networks with shared norms and values, has already been discussed as a driver for innovation and performance improvement. Social Capital is a resource embedded in social structures, which can be accessed as well as mobilised in purposeful actions. The functions of Social Capital are transparency, which reduces transaction costs by improving information flow, and rationalisation, which reduces uncertainty and increases flexibility leading to enhanced performance and innovation. There exist various theories about social resources and structures leading to Social Capital, discussing whether network closure or the absence of ties is the key to success. Nevertheless little is known about the relation between network centrality and Social Capital. Therefore this paper aims to contribute to the discussion by analysing in a case study the structural position of actors who are rich in Social Capital. Additionally it will be assessed if those actors who are central in the social network are the ones with the highest performance. This study was based on a survey of 170 students from a Czech University who form three different networks. For the detection of Social Capital a procedure developed and tested in the European Values Study Surveys was applied and the relational data has been analysed by social network analysis using UCINET.

Key words social networks; social capital; network structure; performance

Biographical note

Mag.(FH) Eva Maria Eckenhofer, graduated in Media Management from University of Applied Sciences in St.Pölten (Austria) in 2008 and works now as a PhD Student on Tomas Bata University in Zlín on the Faculty of Management and Economics on her dissertation in the fields Social Capital, trust and organisational networks. The title of her dissertation will be: 'Strategic Networking as a Management-tool'.

Social Capital and its measurement

Social Capital has become a scientific buzzword and the discussions about its definitions, forms and attempts to measurement are widespread. Nevertheless it is questioned whether Social Capital is actually a form of capital (Halpern, 2005). What is known for sure is that the importance of this form of capital is imbedded

in social networks and that its importance increases under imperfect competition. (Burt, 1992)

While Lin defined it as a 'resource embedded in a social structure that are accessed and/or mobilised in purposive actions', (Lin et al., 2008) Putnam sees that 'the central idea of social capital is that networks and associated norms of reciprocity have value'. (Robert D. Putnam, 1996). Another component in building this resource is trust, which is defined as an expectation that arises within a community of regular, honest and cooperative behavior based on commonly shared norms (Fukuyama, 1995). Tsai divided Social Capital into three dimensions, the structural, where the contacts of an actor are located, relational, where the assets such as trust and trustworthiness are rooted, and a cognitive dimension which includes a shared code and vision (Tsai, 1998). Therefore it can be summarised that in general Social Capital is a resource which is embedded in social networks based on trust and specific norms.

How can these resources be attained or even measured? We know that due to participation in associations individuals are likely to change their values and preferences (Paxton, 2002), and trust and civic-minded behavior emerge by involvement in formal and informal groups and associations (Putnam, 1996). This can be explained by self-enforcing agreements which are reached in repeated interactions and lead to trust within the group, but also to civic behavior in general (Knack and Keefer, 2003).

In the UK this principle was taken in order to grow community involvement by 'corporate and employee volunteering'. The benefits are not only leading towards a trusting and networking community, but moreover it exhibits benefits for every individual as well as the companies (Muthuri et al., 2009). These benefits are intangible (reputation, knowledge) as well as tangible (financial and material). Moreover a shared vision helps an organisation to develop Social Capital and combine resources (Tsai, 1998).

Social capital leads to benefits on multiple levels, on an individual, group and community level (Paxton, 2002), but in general it contains structural and action-oriented elements (Lin et al., 2008, p. 58) and the returns can be categorised into returns to instrumental action and returns to expressive action (Lin, 1999). Returns on instrumental actions are economic, political and social return. Economic return can be the increase of turnover due to a new customer. Political return is, e.g., the influence on a legislative change and social return can be a contribution to a better reputation. Return on expressive action enforces and secures one's resources against possible losses. Moreover these effects make a positive contribution to one's physical and mental health as well as life satisfaction (Halpern, 2005), which goes with Cooke's statement: 'Human Capital is judged by individual income, while social capital is judged by quality of life.' (Cooke, 1999). Following Cooke (1999), the benefits lead back to embeddedness (communication benefits, integration and synergy) as well as to autonomy (integrity, linkage).

This leads to the assumption that actors with higher Social Capital have the possibility to perform better than other actors with lower Social Capital as they can mobilise higher amounts of resources which lead to returns on instrumental or expressive action.

Attempts at measuring this kind of capital, lead from Lin's Position-Generator,

where professions in one's ego-network are queried (Lin et al., 2008, p. 77), to Snijder's Resource-Generator, where specific services in one's Ego-Network are asked for (Van Der Gaag and Snijders, January 2005). Van der Gaag and Snijders argue this as follows: 'Here, we concentrate on measuring social capital within the 'access' perspective, and define social capital as the collection of all potentially available network members' resources.' (Van Der Gaag, Snijders January, 2005).

Another approach comes from Beugelsdijk and Van Schaik who combine general and institutional trust, group-membership, volunteering, free-time behavior and trustworthiness, in order to generate a Social Capital Index, by taking data from the European Value Studies (Beugelsdijk, 2005; Beugelsdijk and Van Schaik, 2002, 2005; Beugelsdijk et al., 2004). This fits to the idea that 'Social Capital is a communal property involving civic engagement, associational membership, high trust, reliability and reciprocity in social networks.' (Cooke, 1999) Moreover, as Social Capital has been defined as a resource embedded in a social structure (Lin et al., 2008, p. 58), it measures the investments made into one's social network in general. These investments are done over a longer time, as social networks and trust needs time to be built and tested (Fukuyama, 1995), so that when needed they are a channel for information and resource flow and therefore an entrance ticket for future options (Tsai, 1998; Lechner, 2003).

Network Positions and their effects

From numerous studies it is know that there exists a connection between Social Capital and economic performance (Beugelsdijk, 2005), between Social Capital and the quality of governance and economic growth (van Bouma, 2005), and between education and Social Capital as well as between Social Capital and health (Halpern, 2005).

Also concerning the influence of the structure of a social network and the positions of actors within it we know that productivity (Granovetter, 2005), resources-access (Lin et al., 2008, p. 76) , knowledge-transmission (Halpern, 2005) and innovation (Cooke, 1999) are influenced. Burt classifies these benefits into information and control benefits and ascribes the advantages of actors in a social network to their position as brokers, next to structural holes (Burt, 1992). Coleman sees the reason network benefits in the network closure (Coleman, 1988) and Granovetter ascribes benefits to the type of the actors ties' (Granovetter, 2005).

Within a network, specific structural positions can be identified which all have different characteristics and opportunities due to their location in the network. Central connector, boundary spanner, information broker and peripherical specialist (Cross, Prusak, 2002), or broker, consultant, gatekeeper, representative and liaison (Hanneman, 2007), as they can be analysed in the Social Network Analysis Software UciNet, can be distinguished. Following Cross, central connectors link most people in a network, boundary spanners link different network parts, information brokers are local stars in a network and peripherical specialists are consulted for specialised information (Cross, Prusak, 2002). Due to their structural position these actors provide certain benefits for themselves, which leads to the idea that they are able to perform due to their position in some way better. Due to their structural characteristics it is possible to find them within a social network,

though we do not know anything about their general characteristics. This leads to a list of questions which shall be discussed in this paper using data from a case study.

Actors which are central in a network, central connectors, are, because of number and type of their contacts, more central within the network and therefore it can be assumed that they have the possibility to get access to a broader field of information. This could provide them with an advantage leading to better performance, compared to those actors who are not so centrally positioned. Therefore it will be asked in the scope of this paper whether there is a connection between centrality within a network and the performance of the actor having a central position.

Another interesting question is whether those actors having a central position within a network are also those who are more likely to have higher resources in Social Capital. It has been discussed above that trust, civic engagement and trustworthiness are main components of Social Capital. It can be assumed that an actor who trusts more is trustworthy and more engaged in society in general and is also more likely to be social and connecting within a specific network.

Trust and its influence

Trust can be defined on a general network or societal level as 'Expectation that arises within a community of regular, honest and cooperative behavior based on commonly shared norms on the part of other members of that society', (Fukuyama, 1995) but also at an individual relationship level as an attribute of a relationship, which is an expectation that alleviates the fear that the other one could behave opportunistically. Trustworthiness on the other side is an attribute of an individual (Tsai, 1998).

There exist different kinds of trust, the basic, simple one as in a friendship, the blind trust to a superior and the authentic trust based on skills and relationship (Dervitsiotis September, 2006). Trust is built over time, through interaction and evaluation on integrity (ethical attitude), benevolence (goodwill) and competence (ability) (Becerra, Huemer, 2002). The basis of building trust is interpersonal communication and proximity in psychological, cultural, social and physical dimensions (Becerra, Huemer 2002), (Lechner, 2003), (Gössling, 2007, 12:5). As proximity is a criterion of trust it can be assumed that high trust is going along with high proximity within a network, or on the opposite a low trust level goes together with lack of proximity and therefore a low network density.

The effects of trust on the networks in which it arises as well as on the actors within trusting networks have been studied. Trust is said to enable more efficient operating processes (Dervitsiotis September, 2006), matters in the effectiveness of exchange relations, especially in inter-organisational relationships (Becerra, Huemer, 2002).

On a societal level higher trust increases investment and growth (Van Schaik, 2002), and on the relationship level trust is associated with greater open communication, lower emotional conflict, faster decision-making and greater willingness to take risks. As trust reduces the complexity, the need for constant surveillance and the constraint of opportunism, it leads to a decrease of transaction costs for individuals as well as for companies (Becerra and Huemer, 2002). This is possi-

ble as trust reduces monitoring costs and enables heuristic-based decision-making (Uzzi, 2008). Another positive influence of trust is that information exchanges are more proprietary and tacit, and that it reduces therefore the information asymmetry between parties. As trustful relations within a network are said to increase information flow and lower monitoring cost, it can be assumed that within a network of a higher trust level, also the performance will be better.

Assumptions and Methodology

In Part 1 to 3, several assumptions, based on scientific literature and studies which have been done, shall be discussed and enlightened by a small survey which was conducted at Tomas Bata University between December, 2009 and May 2010:

Assumption 1: Higher Social Capital of an actor is connected to higher performance.
Assumption 2: Central position of an actor is connected to higher performance.
Assumption 3: A higher level of Social Capital is connected to higher centrality.
Assumption 4: The level of trust of a network is connected to its overall performance.
Assumption 5: A higher level of trust of an actor is connected to higher performance.

For analysing these assumptions three groups of students at Tomas Bata University Zlín (CZ) have been asked to fill in a questionnaire. A total of 170 students filled in the questionnaire, from this number 41 were second-year students who subscribed to a Desktop-Publishing lecture, 56 first-year students who followed statistics lecture and 73 were PhD students of the faculty of Management and Economics on Tomas Bata University.

The questionnaire contained questions about students' relationships to their colleagues, the number of languages they spoke, if they had already been abroad for more than three months, and questions linked to social capital which were used in the European Value Studies (Beugelsdijk, Van Schaik). First it was asked: 'Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?' Then the students were asked to evaluate their level of trust in institutions like a church, parliament, press etc. Then they were asked if they were a member or volunteer in certain organisations, how they spend their free-time and finally, in order to evaluate their trustworthiness, they were asked to estimate whether certain statements like 'Claiming state benefits which you are not entitled to' are always, sometimes, rarely or never justified.

From the relational questions social network analysis of the whole network using Ucinet has been done. Social network analysis is a social ethnological method which can be used to measure and visualise the social structure of a group as a whole and the social embedment of its individuals / actors (Schnegg and Krenn, 2009; Jansen, 2006; Wasserman and Faust, 2008). The focus of a social network analysis can be a single actor or an aggregate of persons – whole groups, as it has been done in this study. The components are the social relations between these actors, which can be based on kinship or friendship. In our case, communication, going-out, advice-seeking and lending-money relations have been collected.

Using the aggregated total network, centrality and prestige measures of the whole network and from individual actors has been calculated. These concepts are based on the idea that the actor who has many ties within the network is more central and therefore more visible. Prestige measures show actors who can influence the network. It is a contribution to social capital, as more prestigious actors have more access to resources. As there is not a single measure which describes centrality best, all three major centrality measures, degree-based, closeness-based and betweeness-based centrality have been calculated in order to correlate them later with the performance data of the students (Hanneman, 2007).

Degree-based centrality is measured by the outdegree of an actor, which computes all outgoing relations to other actors in the case of an asymmetric and directional network. For a symmetric and nondirectional network all relations are computed. Closeness-based centrality measures not only the direct but, moreover, the indirect relations to other actors (path distances). The closeness of an actor is measured by the reciprocal of the sum of all path distances of an actor. Betweeness-based centrality has a different logic as degree-based and closeness-based centrality as it starts from a dyad and computes the shortest path distance from one to another, called geodesic. The idea behind it is the probability that communication from actor *a* to actor *b* will run over actor *c*. The ratio of the number of geodesics between *a* and *b* going through *c* to the total number of shortest paths between *a* and *b* is computed in order to get the betweeness-based centrality (Wasserman and Faust, 2008; Jansen, 2006). The next step was to run factor analysis, which can be used to reduce the number of variables, to detect structure in the relationships between variables and to classify them. (StatSoft, 2010). Therefore, as factor analysis can be applied for data reduction, the five trust, trustworthy and public involvement questions have been reduced to one variable called 'Social Capital' as it has been done by before Beugelsdijk with three variables in order to create a social capital index using data from the European Value Studies (Beugelsdijk and Van Schaik, 2005; Van Schaik, 2002). After this step correlations were done from the new variable 'social capital' as well as the original ones, the performance variable, the number of languages, being abroad and the centrality measures of the actors.

Moreover the relationships between the average performance, level of Social Capital and trust, centralisation and density of the whole networks were computed. Finally the structural position of the better performing actors in average of their grades as well as Social Capital, have been analysed qualitatively.

Analysis

Statistical Analysis

Correlations

After aggregating the different relations in every network, the centrality measures degree, closeness, reach and betweeness have been calculated in Ucinet for every actor from each network. For analysis we used the values number of languages, being abroad, average degree, trust, institutional trust, involvement, free time and trustworthiness to correlate them with the centrality measures, calculated in Ucinet.

For correlating other values with the performance measure average grade we had to exclude the network of PhD students as they do not get any grades and their performance could have been measured only by the number of their publications.

On a significant level of p-value under 0.05 we found several weak correlations and one moderate correlation. The moderate correlation we found between involvement and free time with r=0.565.

On a weak level being abroad correlates with the number of languages an actor speaks. The number of languages someone speaks correlates with the variable inCloseness. Another interesting weak negative correlation has been found between the average grade and being abroad. The negative direction can be explained as a lower average grade means a better performance than a higher average grades. The grades are measured on a scale ranging from 1 to 3. Also weak and negatively correlates the average grade with the centrality measures degree, share and reach. Surprisingly also negatively weak is the correlation between institutional trust and inCloseness, but positive with outCloseness. Another negative weak correlation has been found between the value trustworthiness and outCloseness and outward Reach. A weak positive correlation again has been found between the values for free time behaviour and the centrality measure degree. A significant correlation has neither been found between the five Social Capital Values, nor between trust and performance.

Also on a meta-level comparing the average of the three networks there was no correlation found between density, centralisation and clustering and social capital. One strong correlation from 0.997 at 0.05 p-value has been found between the average level of trust and social capital, which is logical as Social capital is based on trust.

Factor Analysis

Before doing Factor Analysis from all five Social Capital values as Van Schaik (2002) proposed, we ran Factor Analysis from Trust, active and passive Membership as Beugelsdijk and Van Schaik did in 2005 (Beugelsdijk, 2005).

Our factor loadings from these three variables are 0.246 for trust, 0.654 for passive Membership and 0.827 for active membership. The result of their factor loadings were 0.49 for trust, 0.75 for passive membership and 0.89 for active group membership.

Our factor loadings were about 0.2 points smaller which can be explained by the difference in n, while we were calculating from 170 items, Beugelsdijk and Van Schaik used the database from the European Value Studies and had supposedly many more items. Nevertheless the rank and the differences in factor loadings were similar.

Even as the correlations of the five social capital values were not significant we proceeded to the next step to do factor analysis of these values. By calculating one factor we got a lower p-value as for calculating two factors, which supposes on the one hand that two different factors would be a more adequate explanation. On the other hand, some of the factor loadings are higher than 0.4, which is quite good and, moreover, in total these five variables describe 66.5% of all variance, while p-value suggests that the null hypothesis is correct. Therefore we decided to

Table 1: Correlations of the five Social Capital values.

	Trust	Instit. Trust	Involvement	FreeTime	Trustworth.
Trust	1.00000000	0.14766883	0.15876757	0.11571389	0.02182192
Instit.Trust	0.14766883	1.00000000	0.10386980	-0.04641903	0.05485412
Involvement	0.15876757	0.10386980	1.00000000	0.21750242	0.06182872
FreeTime	0.11571389	-0.04641903	0.21750242	1.00000000	-0.05979438
Trustworth.	0.02182192	05485412	0.06182872	-0.05979438	1.00000000

Source: own

proceed with one factor called Social Capital.

Table 2: Factor Loadings for Factor Analysis the five Social Capital values, calculating one factor

Loadings:	Factor1	Loadings:	Factor1	Factor2	
Trust	0.351	Trust	0.135	0.288	
Instit. Trust	0.357	Instit. Trust	0.994		
Involvement	0.430	Involvement		0.501	Source: own
FreeTime	0.407	FreeTime		0.432	
Trustworth.	0.252	Trustworth.	0.176	0.140	
The p-value	0.624	The p-value	0.656		

The two different factors provided by factor analysis derive from different variables. Factor 1 derives mainly trust Institutional Trust followed by Trust and Trustworthiness. This factor could be described as an overall Trust Value. The second one is mainly based on Involvement (Group Membership) and Free Time Behaviour, complemented by trust and trustworthiness. This factor can be described as a societal value of an actor.

In order to analyse if Social Capital has an influence on the centrality or performance of an actor, we calculated a Social Capital Value based on the factor loadings. Contrary to Beugelsdijk and Van Schaik, we did not rescale it, as the primary use was to calculate the size of actor nodes attributes based on Social Capital Value, similar as it has been done with performance.

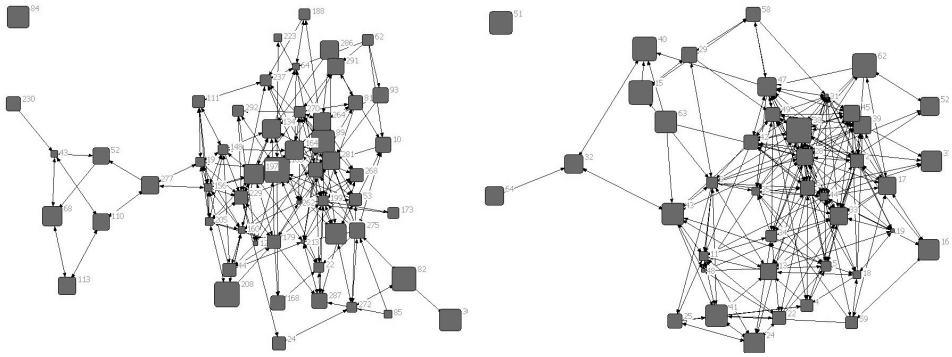
Correlating the new Social Capital Value with the centrality measures gave a low but on 0.05 p-value significant correlation of 0.225 with InCloseness. Also Degree and Reach-centrality were on a similar level significant.

No Significant correlation was found between Social Capital Value and the performance of a student.

Qualitative Analysis

For qualitative analysis the aggregated social networks of the statistic-students and desktop-publishing students have been displayed by Netdraw. The relational ties have been kept bidirectional and the graph-theoretical layout of the network was generated by spring embedding, an algorithm that uses iterative fitting to locate the points to each other according to their smallest geodesic distance.

Figure 1: Aggregated Social Network of Statistics (left) and Dtp-Students(right), node-size according to average-grade



Source: own

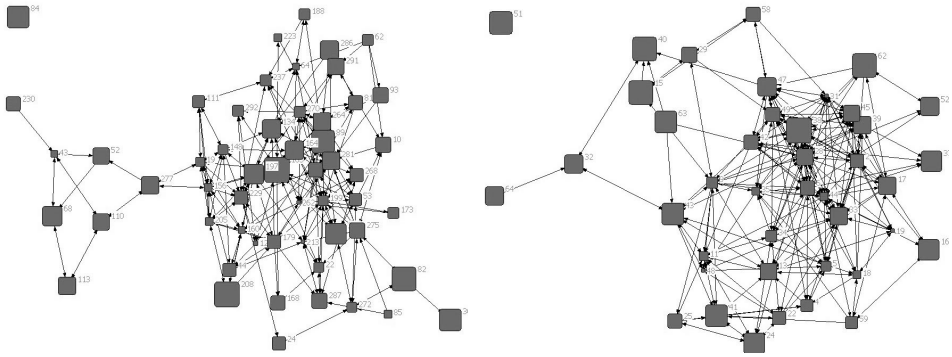
In Figure 1 the node size in the students' networks has been calculated according to their average grade. As the average grade is measured on a scale from 1 to 3, a better student is indicated by a smaller node within the network.

Comparing these two networks it is visible that in both networks we can find smaller nodes, which indicate that those are good students, in the centre and having many ties to others. This observation is a visible confirmation of the correlation done prior. In the network of statistic students on the left side we see that the actor with the number 43 is really small and has three reciprocal ties within this sub network. In the right part of the statistics network we can find several small (above average) students who are connected to many other nodes, such as 19, 156, 205, 262, 64 and many more.

On the right side in the network of desktop publishing students we can find five really small nodes which are densely connected to others. An interesting example is actor 11 and 48, who are both small, highly connected and close to each other.

In those two networks the node size has been calculated based on the social capital level of the student. Therefore a bigger node indicates a higher level of social capital, which has been calculated based on the factor loadings from the factor analysis. Not as obvious as for performance, but still we can find bigger nodes in the centre. Several 'big' nodes, which are rich in social capital we can find next to global payers in the role of an insider or hub. Actor 277 of the desktop publishing network is building the link between the sub network and the main network and has a considerable bigger larger node size, and therefore higher level of social capital, than the actors around him. In the network of Statistic-Students actor 9 is a similar example, he is connecting the main network and the 'outsiders' of the network. Also actor 29, who is connecting the outsiders of the network, has many ties and is bigger than the actors around him. An exception from this is actor 13, who is, while being small, densely connected within the main network.

Figure 2: Aggregated Social Network of Statistics (left) and Dtp-Students(right), Node-size according to Social Capital



Source: own

In Figure 3 the size of the node has been calculated considering both the levels of social capital and performances. This does not show much difference; just a small tendency is visible that bigger ties are more central, this is more the case in the network of desktop publishing students than in the network of the statistic students, where we can find a very small node totally in the centre and several big nodes located at the border of the network. At the network of desktop publishing students, we have a smaller sub-group at the left side and many bigger ones in the right part of the network, though still in the centre of the network there are three small nodes.

Discussion

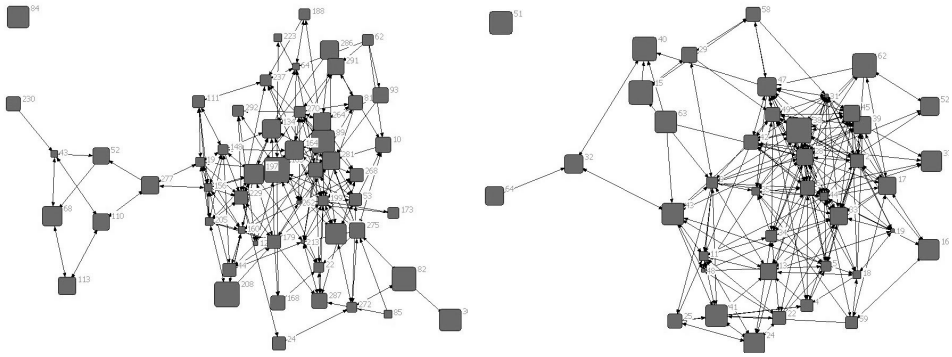
After statistical and qualitative analysis of the data collected in a small survey, we can now discuss the findings under consideration of the assumption done beforehand in the literature review.

The first assumption made was that higher Social Capital of an actor is connected to higher performance. In the student networks we analysed, we could not find any correlation between Social Capital and performance. It can be taken into consideration, whether the kind of Social Capital measurement or the measuring of performance might be the reason, or if these two variables do not affect each other.

The next assumption was that the central position of an actor is connected to a higher performance. Analysing the networks of statistic and desktop publishing students we found a significant correlation indicating that centrality is to some extent connected to performance.

Also for assumption three, concerning the connection between social capital and centrality, we found proof in our data. A weak, but significant correlation is between social capital and centrality, which leads to the conclusion that in fact in

Figure 3: Aggregated Social Network of Statistics (left) and Dtp-Students(right), Node-size according to Social Capital and average grade



Source: own

the networks analysed central players perform better by means of average grade and social capital.

Proof of connection between trust and performance was neither found on an individual, nor on an aggregate level. Therefore assumptions four and five were rejected by our data.

Interesting findings were the correlations between being abroad and the number of languages, as well as the number of languages and closeness and the average grade and being abroad. These correlations suggest the conclusion that learning languages and spending some time abroad in a foreign country has a positive influence on the average grade and being in a central position within a network.

The measurement of social capital was another important part of our survey. From the literature review the methodology proposed by Beugelsdijk and Van Schaik was integrated into our study. Adopting the questions used in the European Value Studies, where the findings are used to compare countries, for analysing Social Capital on an individual level, an experiment was done first in the field of Social Network Analysis and Social Capital Studies. Van Schaik proposed the four dimensions of Social Capital: Interpersonal trust, Institutional trust, Participation in civic society (formal and informal) and trustworthiness (Van Schaik, 2002). Nevertheless as the use of these dimensions for generating a Social Capital Index was not found before in scientific literature, factor analysis from trust, active and passive membership as Beugelsdijk and Van Schaik did in 2005 (Beugelsdijk, 2005), was done beforehand, in order to see if the factor loadings are comparable even in a smaller amount of data. As the factor loadings were comparable, we ran Factor Analysis from all five dimensions, five values. The problem was that the only significant but, therefore, moderate correlation was between involvement and free time with r=0.565. This finding addresses the questions about formal or informal membership and the question about free time behaviour, are looking into the same dimension: Participation in civic society.

Another insight was that trustworthiness does not significantly contribute to Social Capital, though the question is whether this is really the case, or whether this effect results from social expectancy and cheating. Nevertheless a weak connection between the variable called Social Capital, calculated from the factor loadings from factor analysis, and centrality within the network could have been found.

Conclusion

Disregarding the uniqueness and the novelty of the findings in this survey, this survey has some limitations due to the size. At the centre of the analysis were three different networks of students, with a total number of 170 students, which does not allow any generalisation. Another limitation is the small size of the correlations found in the data, which is on the one hand clearly disputable, but on the other hand obvious as the performance of a human being, especially the examination performance of a student will never depend on one single variable.

It is a matter of further studies to confirm the findings from these three networks on a broader scope and evaluate if the connections are comparable to other student groups, student groups in different countries, or even to other types of networks.

The connection between Social Capital and centrality within a network, as well as between centrality of an actor and his performance, should be analysed in detail in the future, as the social-capital-questions used in this study could potentially be posed in job. The social capital dimensions and the questions used for collecting them, which were adopted for this survey from the European Value Studies, have to be tested again and analysed to see if a social capital index generated from its values is justified and comparable.

In business also the centrality of employees within the intra-organisational network can become an evaluation criterion, if a significant connection between centrality and performance could be proved in general. Studying this is always connected with the problem of defining performance. As we had difficulty in this survey to define the performance of a PhD student, also in business the performance of an employee cannot always be measured by a single variable.

Another consideration for further research is to determine whether the number of languages a person speaks or spends some time abroad also influences other fields.

In summary we can say that in the survey conducted in the scope of this paper central players do perform better, by means of average grade and Social Capital.

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Call for Papers

Papers to be included in the next issue should be preferably focused on topics related to social-networks in one or more of the following subjects (the list is indicative rather than exhaustive):

Sentiment/Opinion Analysis in Natural-Language Text Documents

Algorithms, Methods, and Technologies for Building and Analysing Social Networks

Applications in the Area of Social Activities

Knowledge Mining and Discovery in Natural Languages Used in Social Networks

Medical, Economic, and Environmental Applications in Social Networks

Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. Each of the submitted research papers should not exceed 26 pages. All papers are refereed through a peer review process.

Submissions should be send in the PDF form via email to the following address: `SoNet.RC@gmail.com`

Accepted papers are to be prepared according to the instructions available at `http://www.konvoj.cz/journals/mmm/`.