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The Relation between Social Capital and Trust with Social Network Analysis

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Abstract—The purpose of this study is analyzing the relationship between trust and social capital of people with using Social Network Analysis. In this study, two aspects of social capital will be focused: *Bonding, homophilous social capital (BoSC),* and *Bridging, heterophilous social capital (BrSC)*. These two aspects diverge each other regarding to the social theories. The other concept of the study is *Trust (Tr)*, namely interpersonal trust, willing to ascribe good intentions to and have confidence in the words and actions of other people. In this study, the sample group, 61 people, was selected from a private firm from the defense industry. The relation between BoSC/BrSC and Tr is shown by using Social Network Analysis (SNA) and statistical analysis with Likert type-questionnaire. The results of the analysis show the Cronbach's alpha value is 0.756 and social capital values (*BoSC/BrSC*) is not correlated with *Tr* values of the people.

Keywords—Social capital, interpersonal trust, social network analysis (SNA).

I. INTRODUCTION

SOCIAL capital, once studied primarily in the social and political sciences, has become increasingly important in the organizational sciences as a mechanism for the creation and maintenance of healthy organizational [1]. High levels of social capital have been shown to have a good impact on multiple aspects of organizational life including individual career success, compensation and placement, employee recruitment and retention, team effectiveness, interdepartmental resource exchange, product innovation and entrepreneurship, as well as external relationships with suppliers, regional production networks, and other firms [1], [15].

Reference [14] suggested that there are two types of social capital; *bonding*, which facilitates strong inwardly focused fairly homogenous groups, and bridging, which extends outward to include many diverse constituencies. The notion of social capital has also been associated with more up-to-date forms of leadership as the definition of leadership has expanded from a set of traits residing in one individual to a function of the collective type [15].

Interpersonal trust is a complex matter of fact that has been traditionally associated with favorable consequences for both the staff and the organization [18]. For example, some researches show that trust has been positively related to organizational performance [20] and job satisfaction [21]. However, although organizational researchers have paid special attention to examining the numerous potential benefits

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of trust, they have devoted significantly less attention to examining the different ways that trust might transmit these benefits [22].

II. SIGNIFICANCE OF THE STUDY

Networks in organizations involve almost every aspect of employee behavior [6], [9]. Social interactions and the networks powering social interactions shape employee knowledge by information sharing and provide opportunity for innovative uses of idiosyncratic knowledge, which can result in important organizational outcomes [16]. Understanding the effect of social orientations on employee perceptions may provide management insight into the social influences shaping employee competencies for accessing and leveraging efficacious knowledge flow.

Reference [24] highlights the importance of explaining and developing the consequences of interpersonal trust and knowledge flow in organizational environments. Research on the level of trust among and between the members of an organization is a critical issue for knowledge flow but under-explored variable [10]. From the social-capital perspective, the accumulation of social capital requires a significant amount of trust to be established in and between all levels of an organization [2]. In this study we aim to develop a better understanding of how the relationship between social capital and trust.

III. THEORETICAL FRAMEWORK

This study related to the broad area of business management. Theoretical basis derived from the fields of organizational behavior, social capital theory, complexity theory, individual and institutional behavior. Study variables grounded the research and provided keen insight into the knowledge flow challenges that may affect organizational performance.

A. Social Capital

In order to better understand social capital, the meaning of the term "capital" should be evaluated. Capital is an asset that is valuable for the production of other assets. Social capital can be assumed as a fourth type of capital together with human capital, financial capital, and physical capital [12]. Reference [1] identifies the points where social capital differs from and resembles other sources of capital. The major and the big difference of social capital from other forms of capital is that it is not found in the individuals themselves, but in the relations between individuals. Moreover, it is said that social

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capital can be a complement or substitute to other forms of capital.

References [13] and [17] analyzed three dimensions of social capital in the organization context. The *structural dimension* represents the network structure, network configuration, and pattern of linkages. For example, industrial districts generally have dense and non-hierarchical networks. *The cognitive dimension* is related to the shared goals and shared culture in a clique. Sharing the same competitive position may lead to the creation of a shared industrial recipe among partners. The last dimension is the *relational dimension*. A lack of trust may cause confusion in the network and harm the process of knowledge transfer.

Generally, people try to join many social networks to gain more advantage. In this study, [14] two aspects of social capital will be focused: *Bonding, homophilous social capital (BoSC)* which implies better strong, dense or closed network ties and *Bridging, heterophilous social capital (BrSC)* which implies weak ties, bridging the structural holes. Both serve useful purposes. *BoSC* provides social and psychological support for its members creates solidarity and facilitates reciprocity. *BrSC* can facilitate information dissemination and linkage to external resources.

B. Trust

Trust is both a rational act, facilitated by social structures, and an emotional process, fostered by the perceived reliability of the group being trusted and faith by the individuals offering their trust [25]. Its presence is implicitly assumed to increase the likelihood that expected outcomes will result from the relationship [26]. Trust was dispositional and "trait-like" and to argue that trust was an aspect of relationships. That meant it can be varied and changed within person and across relationships [24].

Emphasizing the temporal and contextual nature of trust, individuals differ in their willingness to trust others [19]. This individual capacity or willingness to trust is impacted by the organization. A person could bring a high propensity for trust related to the direct supervisor at the start of a new job. The actions of the supervisor and the influences of the organizational environment over time either strengthen or weaken this individual level of trust [24].

Based on the point of view of the study, interpersonal trust at work recognizes that, with regard to mutually dependent work groups within an organization, trust may be placed along two different dimensions: (i) faith in the trustworthy intentions of others, and (ii) confidence in the ability of others, yielding ascriptions of capability and reliability. From the viewpoint of white or blue-collar employees each of these dimensions can refer to either (a) peers or (b) management thereby providing a fourfold classification [11].

C. Social Capital and Trust

Social capital is influenced by many factors [23], among which, the effect of trust on social capital has been addressed in related studies. [5] Pointed out that trust provides a solid foundation for cooperation as observed in the mutual trust exhibited by team members. The need to cooperate elicits human capital and maximizes the strength of the team. In an educational research report, [27] suggested that social trust can affect and raise social capital, which in turn, enhances the quality of education.

IV. OVERVIEW OF THE RESEARCH METHOD

A quantitative method provided the foundation to investigate testable hypotheses derived from the literature review. Quantitative modeling represented the multivariate relationships among the study variables. Deductive analysis, hypothesis-testing, and the use of standardized instruments constituted the quantitative techniques and instruments for the study Hypothesis-testing of the interpersonal trust occurred through inference testing of data derived from a self-reporting survey instrument and from correlation and regression techniques [3].

In this study, measured data for trust derived [11]'s Interpersonal Trust at Work Questionnaire (ITQ). The ITQ shows good promise as a brief trust measurement scale in terms of faith in intentions of peer and management and confidence in actions of peer and management. The response scale ranges 1-7.

The social capital data were gathered from Single Item Generator (social relations and trust between colleagues) given in [17] survey. The question for social relations is "How often do you do something (i.e. going fitness center, cinema, theater, shopping, skiing) with your colleague after work?" and the question for trust is "How often do you talk about private matters with your colleague and ask them for help?" Respondents give the frequency rate between 0 (never) – 10 (always) points.

A. Research Questions

Guiding the study was the following research question. *To what extent do the social orientations and relations influence interpersonal trust in the organization?* Hypothesizing a relationship between interpersonal trust and social capital showed how social processes could shape relationship between employees. Fig. 1 presents the assumed relations among the variables in the study.
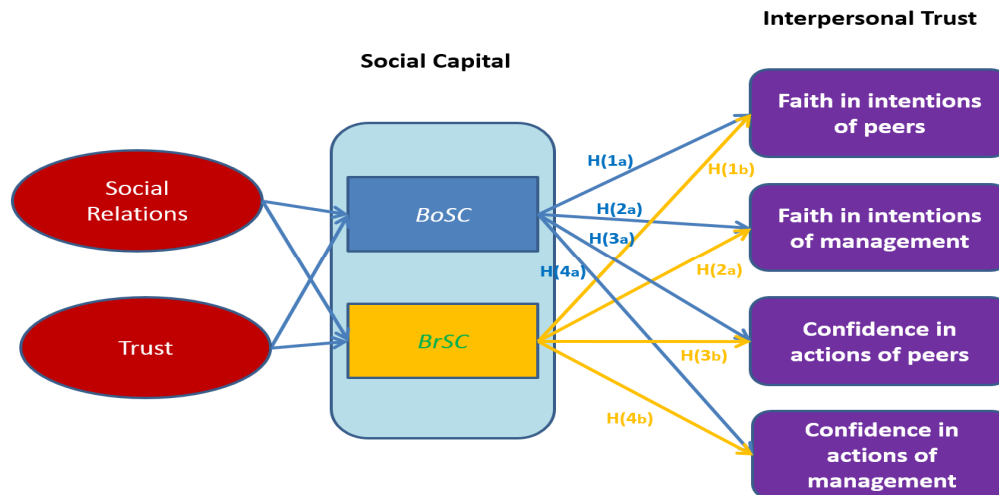
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Fig. 1 Hypothesized relations among study variables

Hypothesis 1a: Suggested higher levels of BoSC would positively associate with higher levels of faith in intentions of peers.

Hypothesis 2a: Suggested higher levels of BoSC would positively associate with higher levels of faith in intentions of management.

Hypothesis 3a: Suggested higher levels of BoSC would positively associate with higher levels of confidence in actions of peers.

Hypothesis 4a: Suggested higher levels of BoSC would positively associate with higher levels of confidence in actions of management.

Hypothesis 1b: Suggested higher levels of BrSC would positively associate with higher levels of faith in intentions of peers.

Hypothesis 2b: Suggested higher levels of BrSC would positively associate with higher levels of faith in intentions of management.

Hypothesis 3b: Suggested higher levels of BrSC would positively associate with higher levels of confidence in actions of peers.

Hypothesis 4b: Suggested higher levels of BrSC would positively associate with higher levels of confidence in actions of management.

V. THE SAMPLE AND PROGRAM OUTCOMES

The test group is selected from a private firm from defense industry. 8% of group is female, 85% is 35 years old or younger. 64% are married and well-educated like 30% graduated from a BS degree and nearly 60% graduated from master degree. Sample group is an engineering group, all of them graduated from an engineering faculty like electric and electrical engineering, mechanical engineering or computer engineering. The ITQ and single item generator questionnaire are applied to 115 people and 61 people have answered.

The answers are put to analyzing programs regarding to related theory. ITQ answers are analyzed with IBM SPSS Statistics Version 19 and social network analysis is made by using UCINET 6.0 [3].

ITQ [11] is applied to test group with using 7 point Likert type. The Cronbach's alpha for the study showed an acceptable reliability level of 0.756, which its original research made by Cook and Wall's was 0.85. After providing the reliance level for ITQ, the social capital level for each individual in the test group is calculated with using UCINET. Fig. 2 shows the social relations between participants and Fig. 3 shows the trust between participants.

Blue square nodes show male participants, pink circles show female participants. There are 2 isolate nodes in the Fig. 2 but in the Fig. 3 there is no isolate node.

The size of ego network, ego betweenness, bonacich's power, network constraint, number of brokerage value and ego network density can be calculated for each graph. Conceptually, [7] suggested that one can use size of ego network or degree centrality to measure communication activity, betweenness centrality to calculate control benefits, and closeness centrality to estimate questions of independence and efficiency. Bonacich's centrality weighs the importance of connection, a measure widely used to capture the status of a focal node. Network constraint refers to the degree to which an ego is limited by its network connections, and network density represents the overall connectivity of the network [4]. Unlike a centrality measure, network constraint captures the possibility of opportunism, because constraint measure gauges the conditions that make it possible to be opportunistic and manipulate the flow of information [4]. Constraint of each node is a summary measure that taps the extent to which ego's connections are to others who are connected to one another. If ego's potential trading partners all have one another as potential trading partners, ego is highly constrained. If ego's partners do not have other alternatives in the neighborhood, they cannot constrain ego's behavior [8].

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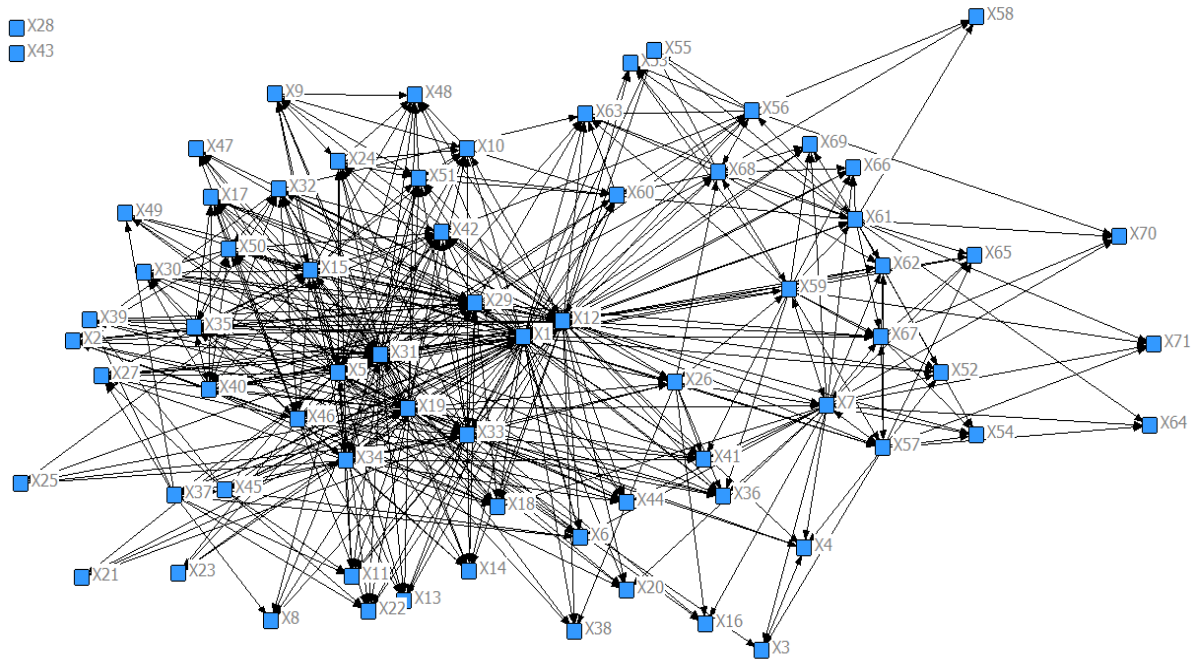Vol:10, No:1, 2016

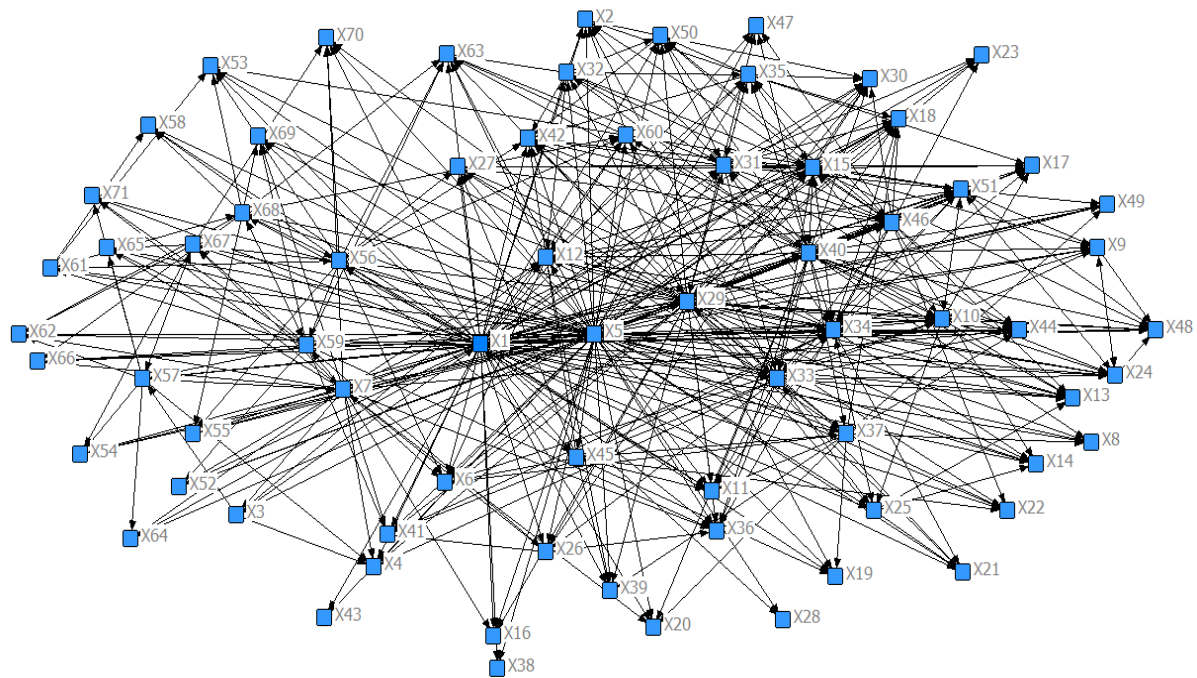Fig. 2 Social relations between participants

Fig. 3 Trust between participants

In this study, only ego betweenness, Bonacich's power and ego network density are analyzed with interpersonal trust data in order to investigate any relations and test our hypotheses. Ego betweenness and Bonacich's power values show the BoSC level of the participants. Actually, there are many calculated index values that show the strong, dense or closed ties. In order to analyze the relationship between two variables, there are so many ways to look at the relation. At the earlier stage of this study, other calculated index values

were also evaluated. But at the end, the total centrality and Bonacich's power values are selected. The same situation and way is valid for BrSC. Ego network density values is selected to show the relation and to test the hypothesis. The findings are analyzed with ITQ in order to test the hypotheses. The key outcomes are given in Tables I and II. On the other hand, the study asks two questions based on the social relations and trust between colleagues. Thus, this leads to for every selected indexes, there are two values. For example, for the relation

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between faith in intentions of peers and ego betweenness, there are two the spearman correlation numbers which are rhoTR_ego_betwn = -,077 and rho SR_ ego_betwn =,074 . To

test the hypotheses, every two- spearman -values are considered. Below only one declined hypothesis is explained. The other hypotheses can be considered as the same way.

TABLE I
SPEARMAN'S RHO VALUES BETWEEN INTERPERSONAL TRUST VS. SOCIAL CAPITAL VALUES (BASED ON TRUST RELATIONS)

	Ego betweenness	Bonacich's power	Ego density
faith in intentions of peers	-,077	,008	,030
faith in intentions of management	-,097	,112	,065
confidence in actions of peers	,018	,048	,041
confidence in actions of management	,139	,259*	-,026

**. Correlation is significant at the 0.01 level (2-tailed), *. Correlation is significant at the 0.05 level (2-tailed).N=71

TABLE II
SPEARMAN'S RHO VALUES BETWEEN INTERPERSONAL TRUST VS. SOCIAL CAPITAL VALUES (BASED ON SOCIAL RELATIONS)

	Ego betweenness	Bonacich's power	Ego density
faith in intentions of peers	,074	-,140	-,016
faith in intentions of management	-,082	-,045	,244
confidence in actions of peers	,130	,054	,021
confidence in actions of management	,000	-,087	,118

**. Correlation is significant at the 0.01 level (2-tailed), *. Correlation is significant at the 0.05 level (2-tailed), N=71

TABLE III
SPEARMAN'S RHO VALUES BETWEEN INTERPERSONAL TRUST VS. DEMOGRAFIC VALUES

	Sex	Age	Experience	Position
faith in intentions of peers.	-,026	-,177	,197	-,164
faith in intentions of management	-,090	-,046	,079	-,038
confidence in actions of peers.	-,115	,052	-,036	-,020
confidence in actions of management	-,197	-,197	,031	-,213

**. Correlation is significant at the 0.01 level (2-tailed), *. Correlation is significant at the 0.05 level (2-tailed), N=71

Testing Hypothesis 1a: Hypothesis H1a is NOT accepted. For BoSC level, two meaningful values are considered. According to Tables I and II, for Ego betweenness, the spearman correlation number is rho TR_ ego_betwn = 0,077 and rho SC_ego_betwn=0,074, p>0.01; for Bonacich's power, the spearman correlation number is rhoSC_Bonacicy =-,140, rho TR_Bonacicy =0,008 p>0.001. This means that the level of BoSC is not associated with the levels of faith in intention of peers.

To explain the hypothesis deeply, firstly clarify the meaning of Ego betweenness and Bonacich's power. Betweenness or centrality of each node shows us the closed and dense ties strength, and Bonacich's power shows us the importance of power of ties. These two values belong to bonding strength of node.

Only Hypothesis 4a can be accepted. According to the Table I and II, for Bonacich's power, the spearman correlation number is rhoSC_Bonacicy =-,087, rho TR_Bonacicy =0,259 p<0.05. This means that the level of BoSC is associated with the levels of confidence in actions of management.

As we expected from the Burt's theory, low density allow nodes to bridge the flow of information and get a strenght according to bridge position. Because of this, negative correlation is shown between TR and BrSC. This means that low density values allow nodes to get more social capital values and this type of social capital is correlated with TR.

After testing the hypotheses, other demographic attributes can be considered. According to Table III, none of demographic attributes is correlated with Trust and its

dimensions. Such that age, sex, experience, and position are not correlated with interpersonal trust dimensions.

VI. CONCLUSION

To sum up, social capital, an important issue and value for the creation and maintenance of healthy organizational life, may be developed through initiatives such as interpersonal trust as it works to develop the individual leader and foster collective leadership. Other relations or other values calculated from UCINET can be analyzed to improve action learning which engages all participants can facilitate the development of bonding social capital between members within a group as well as bridging social capital by strengthening the relationship between groups, departments, or disciplines.

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