

# STUDYING THE RELATIONS OF SOCIAL CAPITAL FACTORS WITH KNOWLEDGE SHARING: A CASE STUDY AT RESEARCH DEPARTMENT OF IRIB<sup>1</sup>

Hassan Darvish  
Rama Nikbakhsh

Hassan DARVISH (corresponding author)  
Associate professor, Payame Noor University, Tehran, Iran  
Tel.: 0098-21-233 22342  
E-mail: dr\_darvish@pnu.ac.ir

Rama NIKBAKHS  
Graduate, Public Administration, Payame Noor University,  
Tehran, Iran

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1 Acknowledgements: The authors would like to thank the Chairman of IRIB Research Center, Mr. Poya.

## Abstract

The aim of our study was to further develop an understanding of social capital in organizational knowledge sharing. We first developed a measurement tool and then a theoretical framework in which six social capital factors (social interaction ties, trust, identification, norm of reciprocity, open-mindedness, and shared language & goals) can have effect on two sides of knowledge sharing; attitude and expectations about knowledge sharing, and quality of knowledge sharing. We surveyed 144 managers and researchers from a research department of IRIB, and then examined their relationships using step-wise multiple regression analysis. We confirm that social interaction ties, trust, norm of reciprocity, and shared language & goals significantly contributed to a person's attitude and expectations about knowledge sharing, but only shared language and goals directly contributed to quality of knowledge sharing.

## 1. Introduction

Today most organizations possess valuable knowledge relating to their products, processes, management, and technologies through their employees. However, often times these organizations do not have enough intercommunication as well as they might or apply this knowledge for maximum advantage. Organizations that are able to manage knowledge of their staff often have a competitive advantage over those organizations that are not as adept at knowledge management (Hoffman *et al.*, 2005). Knowledge sharing activities are generally supported by knowledge management systems. However, technology constitutes only one of the many factors that affect the sharing of knowledge in organizations. Culture, orientation and experience of the knowledge sharer also affect the quality of information meant to be shared. Any organization wishing to promote knowledge sharing must make it clear for its employees that as they shares their knowledge with others to benefit, they equally stands to benefit from them.

During the past decades various economic theories have evolved and influenced organizational operations. This evolution has expanded the traditional forms of capital, such as tangible assets like buildings and equipment, and now includes neo-capital. These intangibles assets likewise contribute to organizational development and growth. The term capital has gained currency in the management literature, which has given rise to several variations of capital such as human capital, relational capital, customer's capital, intellectual capital, health capital, and social capital (Brooks and Nafukho, 2006). Social capital is a social science concept that used in business, economics, organizational behavior, political science, public health and sociology and it refers to connections within and between social networks. Although there are a variety of related definitions, which have been described as 'something of a cure-all' (Portes, 1998) for the problems of modern society, all of them tend to share the core idea 'that social networks have value. Just as a screwdriver (physical capital) or a college education (human capital) can increase productivity (both individual and collective), so do social contacts affect the productivity of individuals and groups' (Putnam, 2000).

Due to its great potentials, social capital can help the knowledge management process in many ways. The Social Capital Theory suggests that social capital, the network of relationships possessed by an individual or a social network and the set of resources embedded within it, strongly influence the extent to which interpersonal knowledge sharing occurs (Nahapiet and Ghoshal, 1998). Through close social interactions, individuals are able to increase the depth, breadth, and efficiency of mutual knowledge exchange (Lane and Lubatkin, 1998). So it's very important to know how different dimensions of social capital can affect the process of knowledge sharing. Even though we have so many researches about the relation of social capital with knowledge management, knowledge transfer and other related concepts, as a result of different viewpoints about social capital knowledge related concepts, we do

not have absolute and similar results in this literature. Also we should consider the fact that social capital is somehow under the influence of culture, and so it should be treated and interpreted carefully in different nationality.

## **2. Theoretical background**

Organizations are social groups, that each of them is specialized in specific activities. Creating and transferring knowledge about their activities and other related subjects (like supply chain, rivals, customers) between their personnel interpersonally, is an activity that takes place in organizations as a result of their intention to survive in this competing world. Sometimes it even becomes necessary to share such knowledge between organizations. Today it becomes clear that knowledge sharing can't be handled only through a technical approach, but it also needs some socio-cognitive approaches to motivate behavior that would help in promoting knowledge sharing, including factors such as incentive rewards, trust, relationships, etc.

### **2.1. Social Capital**

L.J. Hanifan's article regarding local support for rural schools is one of the first occurrences of the term 'social capital' in reference to social cohesion and personal investment in the community (Hanifan, 1916). In defining the concept, Hanifan contrasts social capital with material goods by defining it as:

*'...that in life which tends to make these tangible substances count for most in the daily lives of people: namely good will, fellowship, sympathy, and social intercourse among the individuals and families who make up a social unit... The individual is helpless socially, if left to himself ... If he comes into contact with his neighbor, and they with other neighbors, there will be accumulation of social capital, which may immediately satisfy his social needs and which may bear a social potentiality sufficient to the substantial improvement of living conditions in the whole community. The community as a whole will benefit by the cooperation of all its parts, while the individual will find in his associations the advantages of the help, the sympathy, and the fellowship of his neighbors'* (p. 130).

While various aspects of the concept have been approached by all social science fields, some trace the modern usage of the term to Jane Jacobs in the 1960s. However, she did not explicitly define a term social capital but used it in an article with a reference to the value of networks. Political scientist Robert Salisbury advanced the term as a critical component of interest group formation in his 1969 article 'An Exchange Theory of Interest Groups' in the *Midwest Journal of Political Science*. Sociologist Pierre Bourdieu used the term in 1972 in his 'Outline of a Theory of Practice', (Bourdieu, 1977) and clarified the term some years later in contrast to cultural, economic, and symbolic capital. Sociologists Coleman (1988), Wellman and Wortley (1990) adopted Loury's (1977) definition in developing and popularizing the

concept. In the late 1990s the concept gained popularity, serving as the focus of a World Bank research programs and the main subject of several mainstream books, including Robert Putnam's 'Bowling Alone' (2000).

The concept that underlies social capital has a much longer history; thinkers exploring the relation between associational life and democracy were using similar concepts regularly by the 19th century, drawing on the work of earlier writers such as James Madison ('The Federalist Papers') and Alexis de Tocqueville ('Democracy in America') to integrate concepts of social cohesion and connectedness into the pluralist tradition in American political science. John Dewey may have made the first direct mainstream use of 'social capital' in 'The School and Society' in 1899, though he did not offer a definition (Wikipedia, 2009).

The concept of social capital entered in management science after the work of Nahapiet and Ghoshal (1998). Nahapiet and Ghoshal in their examination of the role of social capital in the creation of intellectual capital, defined social capital as the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital, in their definition, comprises both the network and the assets that may be mobilized through that network. They suggested that social capital should be considered in terms of three clusters: structural, relational and cognitive. They used the previous works on social capital, but their model about social capital dimensions has a very strong influence on management literature. We can say with confidence that most of the research about social capital was based on their work. We also used their model in this research.

**Structural Dimension:** Nahapiet and Ghoshal used Granovetter's (1973) discussion of structural and relational embeddedness to define structural and relational dimensions. Structural embeddedness concerns the properties of the social system and of the network of relations as a whole. The term describes the impersonal configuration of linkages between people or units. Nahapiet and Ghoshal used the concept of the structural dimension of social capital to refer to the overall pattern of connections between actors. Among the most important factors of this dimension they mention the presence or absence of network ties between actors; network configuration that describe the pattern of linkages in terms of such measures as density, connectivity, and hierarchy; and appropriable organization-that is, the existence of networks created for one purpose that may be used for another (Nahapiet and Ghoshal, 1998).

**Relational Dimension:** In contrast to structural embeddedness, the term relational embeddedness describes the kind of personal relationships people have developed with each other through a history of interactions (Granovetter, 1973). This concept focuses on the particular relations people have, such as respect and friendship, that influence their behavior. It is through these ongoing personal relationships that people fulfill such social motives as sociability, approval, and prestige. Nahapiet and Ghoshal use the concept of the relational dimension of social capital to refer to those assets

created and leveraged through relationships Among the most important factors of this dimension they mention trust and trustworthiness, norms and sanctions, obligations and expectations, and identity and identification (Nahapiet and Ghoshal, 1998).

**Cognitive Dimension:** The third dimension of social capital refers to those resources providing shared representations, interpretations, and systems of meaning among parties (Cicourel, 1973). Nahapiet and Ghoshal identified this cluster separately because they believed it represents an important set of assets not yet discussed in the previous mainstream literature on social capital but the significance of which is receiving substantial attention in the strategy domain. These resources also represent facets of particular importance in the context of their consideration of intellectual capital. They only mentioned shared language and codes and shared narratives as the factors of this dimension (Nahapiet and Ghoshal, 1998).

Although Nahapiet and Ghoshal separate these three dimensions analytically, they admitte that many of the features which described are, in fact, highly interrelated. They also identified two characteristics in different forms of social: (1) they constitute some aspect of the social structure, and (2) they facilitate the actions of individuals within the structure (Coleman, 1990).

## **2.2. Knowledge**

Knowledge can be derived from information, when people reason or work with information. So, knowledge consists of information, and information consists of data. Therefore, the keyword is interpretation; people receive data and information from their environments and through interpretation they create knowledge. The interpretation of information and data is based on knowledge and experiences the individual already possesses (Bakker *et al.*, 2006). Davenport and Prusak defined knowledge as ‘a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers’ (Davenport and Prusak, 1998). There are so many different classifications for knowledge, but the most famous one in management literature is the one proposed by Polany and dividing knowledge to two forms, explicit and tacit (1958, 1966). Explicit knowledge is knowledge that has been or can be articulated, codified, and stored in certain media. It can be readily transmitted to others. Tacit knowledge is knowledge that is difficult to be transferred to another person by means of writing down or verbalizing it. While tacit knowledge appears to be simple, it has far reaching consequences and is not widely understood.

## **2.3. Knowledge Sharing**

Knowledge sharing can be considered as the first generation of knowledge management and is described as ‘supply-side KM’ because people can acquire supplied knowledge through knowledge sharing systems (Firestone and McElroy *apud* Vorakulpipat and Rezgui, 2008). Moreover, knowledge sharing is not only defined

as transmitting knowledge to target receivers, but also absorbing and being used by people. It can be represented as an equation proposed by Davenport and Prusak (1998):

$$\text{Knowledge sharing (transfer)} = \text{Transmission} + \text{Absorption (in use)}$$

Today, organizations' members must share their knowledge; indeed, such activities have become a necessity to maintain a competitive advantage for organization survival. However ensuring the knowledge sharing is hard, because knowledge is generated and initially stored within the employees (tacit forms). Early initiatives in knowledge management focused on providing electronic databases, network systems, and software to encourage the distribution of knowledge (explicit forms) but these mechanisms have proved far from satisfactory. More recent approaches have focused on socio-cognitive approaches to motivate attitude and behavior that would help in promoting knowledge sharing, including factors such as incentive rewards, trust, relationships, etc. (Chow and Chan, 2008).

Knowledge sharing involves a set of behaviors that aid the exchange of acquired knowledge. Organizations can be considered as social communities creating, sharing and transferring explicit and tacit knowledge. The main objective of knowledge management is thus to turn individual knowledge into organizational knowledge (Nonaka and Takeuchi, 1995).

#### ***2.4. Social Capital and Knowledge Sharing***

In knowledge management's early days, knowledge was seen as an object that could be stored, transferred, and retrieved with the aid of technology, especially with IT. But in real world, this approach yielded somewhat disappointing results. The insight that knowledge is not simply an aggregate of information that could be de-attached from its context was then introduced and attention shifted to considering the tacit dimension of knowledge. Knowledge is socially embedded in the context where it creates and that makes sense. Thus knowledge sharing is not stimulated by imposing structures and tools but by rich social interaction and its immersion in practice (Hoof and Huysman, 2009).

Social capital theory states that social relationships among the members of a society can be productive resources (Coleman, 1988). Putnam (1995) suggests that social capital facilitates the process of coordinating and cooperating in a society for mutual benefit. Social capital has been defined as 'the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit' (Nahapiet and Ghoshal, 1998, p. 243). Nahapiet and Ghoshal in their work emphasized on the impotence each factors of three dimension of social capital in combining and exchanging knowledge. Also Tsai and Ghoshal (1998) empirically confirmed how social capital facilitates resource exchange and production innovation within the organization. By considering the three dimension of social capital (structural, relational and cognitive), it can be assumed that social capital affect knowledge contributing and collecting by (1) providing access

to people with relevant knowledge or needs and questions; (2) providing a common interest and an atmosphere of mutual trust and appreciation of the value of others' knowledge; (3) sharing a common ability that helps in understanding other people's knowledge and as well as correct interpretation and assessment of all knowledge (Hoof and Huysman, 2009).

Table 1 shows some of the researches in social capital literature which used the three dimensions of Nahapiet and Ghoshal model. The last row indicates the social capital factors that we used in our study.

By following the theory proposed by Nahapiet and Ghoshal (1998), we deploy a theoretical model to study the effects of social capital factors on to aspect of knowledge sharing: (1) attitudes and expectations about knowledge sharing, and (2) quality of knowledge sharing.

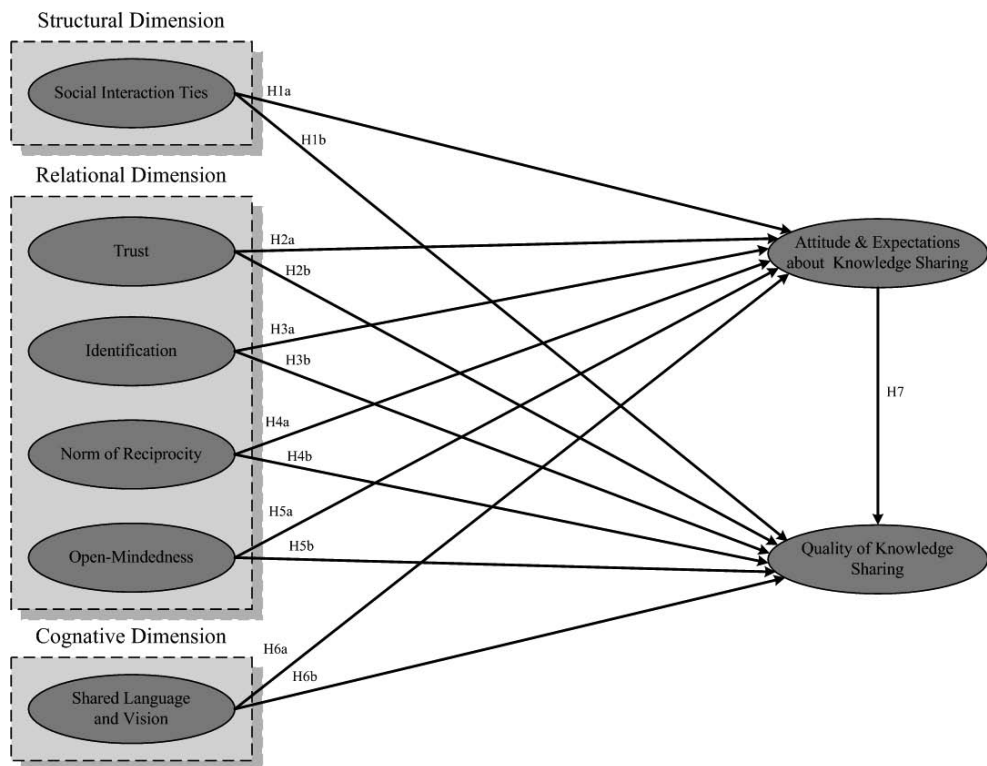
**Table 1:** Some of the researches in social capital literature that are based on the three dimension

Researcher(s)	Structural dimension	Relational dimension	Cognitive dimension	Nature of research
Nahapiet and Ghoshal (1998)	Network ties, network configurations, appropriable organization	Trust, norms, obligations and expectations, identification	Shared codes and language, shared narratives	Knowledge exchange and creation
Tsai and Ghoshal (1998)	Social interaction	Trust and trustworthiness	Shared vision	Resource exchange and value creation
Seibert and Liden (2001)	Weak ties, structural holes	Contacts in other functions, contacts at higher levels	-	Career success
Yli-Renko <i>et al.</i> (2001)	Social interaction, relationship quality, customer network ties	-	-	Knowledge acquisition and exploitation
Chua (2002)	Social tie establishment, frequency of interaction	Trust, empathy, willingness to help, openness to sharing/criticism, group identity	Shared language, shared narrative	Knowledge creation
Liu and Besser (2003)	Social ties	Generalized trust, norms or expectations	-	Knowledge sharing
Requena (2003)	Social relations	Trust, commitment, communication, influence	-	Quality of life in the
Huysman and De Wit (2004)	Network ties, network configurations, appropriable organization	Mutual trust, norms, obligations and identification	Shared codes and language, shared narratives	Knowledge sharing
Lang (2004)	Bounded solidarity	Generalized trust, reciprocity	Value introjections	Knowledge integration
Inken and Tsang (2005)	Network ties, network configurations, network stability	Trust	Shared goals, shared culture	Knowledge transfer
Wasko and Faraj (2005)	Centrality	Commitment, reciprocity	Self-rated expertise, tenure in the field	Knowledge contribution
Chiu <i>et al.</i> (2006)	Social interaction ties	Trust, identification, norm of reciprocity	Shared language, Shared vision	Knowledge sharing
McElroy <i>et al.</i> (2006)	Networks	Trust, norms, Beliefs, Rules	-	Knowledge management
Chow and Chan (2008)	Network configuration	Trust	Shared goals	Knowledge sharing

Researcher(s)	Structural dimension	Relational dimension	Cognitive dimension	Nature of research
Jo (2008)	Social network, Tie strength, Network formation	Trust, Reciprocity, Distance	-	Knowledge sharing
Rhodes <i>et al.</i> (2008)	Network connection	Relationship strength, relation quality, Common norms	Shared values	Effective knowledge transfer
Hoof and Huysman (2009)	Network ties	Trust, social identification	Shared language	Knowledge sharing
Our Study	Social interaction ties	Trust, identification, norm of reciprocity, open-mindedness	Shared language and vision	Knowledge sharing

### 3. Hypotheses

Following Nahapiet and Ghoshal's theoretical model, we define social capital in terms of three distinct dimensions: structural, relational, and cognitive. The most important factor of the structural dimension is the presence or absence of social interaction ties between actors. Among the most key factors of the relational dimension are trust, identification, norm of reciprocity, and open-mindedness. And the most key factor of the cognitive dimension is shared language and vision. In addition to social capital, knowledge contributors' outcome expectations are also important in explaining knowledge sharing in virtual communities.



**Figure 1:** Research model for the effects of social capital factors on knowledge sharing

### **3.1. Social interaction ties**

Nahapiet and Ghoshal argued that ‘network ties influence both access to parties for combining and exchanging knowledge and anticipation of value through such exchange’ (1998, p. 252). Tsai and Ghoshal (1998) considered social interaction ties (network ties) as channels for information and resource flows. The social interaction ties among members of a virtual community allow a cost-effective way of accessing a wider range of knowledge sources. Furthermore, network ties provide the opportunity to combine and exchange knowledge.

**H1a.** Social interaction ties are associated with the attitude and expectations about knowledge sharing.

**H1b.** Social interaction ties are associated with the quality of knowledge sharing.

### **3.2. Trust**

Trust is a relationship of reliance. A trusted party is presumed to seek to fulfill policies, ethical codes, law and their previous promises. It does not need to involve belief in the good character, vices, or morals of the other party. In the management literature, trust has been viewed as a set of specific beliefs dealing primarily with the integrity, benevolence, and ability of another party. Nahapiet and Ghoshal also noted that trust can exhibit greater openness to the potential for value creation through knowledge exchange and combination (1998).

**H2a.** Trust is associated with the attitude and expectations about knowledge sharing.

**H2b.** Trust is associated with the quality of knowledge sharing.

### **3.3. Identification**

Nahapiet and Ghoshal noted that ‘identification is the process whereby individuals see themselves as one with another person or group of people’ (1998, p. 256). They argued that identification acts as a resource influencing the motivation to combine and exchange knowledge. As opposed to group identification, distinct and contradictory identities within groups can make significant barriers to information sharing, learning, and knowledge creation. Valuable knowledge is embedded in individuals and people would not contribute their knowledge unless another person is recognized as their group-mate and the contribution is conducive to their welfare. The perception of social unity and togetherness of the community will elevate people’s activeness to share knowledge and increase the depth and breadth of shared knowledge (Chiu *et al.*, 2006).

**H3a.** Identification is associated with the attitude and expectations about knowledge sharing.

**H3b.** Identification is associated with the quality of knowledge sharing.

### **3.4. Norm of reciprocity**

A norm exists when the socially defined right to control an action is held not by the actor but by others (Coleman, 1990). Nahapiet and Ghoshal believed that norms

can have a significant influence on exchange processes, opening up access to parties for the exchange of and ensuring the motivation to engage in such exchange (1998).

**H4a.** Norm of reciprocity is associated with the attitude and expectations about knowledge sharing.

**H4b.** Norm of reciprocity is associated with the quality of knowledge sharing.

### **3.5. *Open-Mindedness***

There is deference between open-mindedness and indecisiveness. It requires that our minds be open to new evidence. But this is something very different from suggesting that we should be equally accepting of nonsense as we are of sense. Open-mindedness is the willingness to search actively for evidence against one's favored beliefs, plans, or goals, and to weigh such evidence fairly when it is available. Open-mindedness integrates people in a community and confers harmony and trust that new ideas and practices will not be discounted but accepted (Wah *et al.*, 2007).

**H5a.** Open-mindedness is associated with attitude and expectations about knowledge sharing.

**H5b.** Open-mindedness is associated with quality of knowledge sharing.

### **3.6. *Shared language and vision***

Nahapiet and Ghoshal stated that shared language influences the conditions for the combination and exchange of intellectual capitals in several ways. First, shared language facilitates people's ability to gain access to people and their information. Second, shared language provides a common conceptual apparatus for evaluating the likely benefits of exchange and combination. Finally, shared language also stands for the overlap in knowledge. It thus enhances the capability of different parties to combine the knowledge they gained through social exchange (Nahapiet and Ghoshal, 1998). A shared vision is viewed as 'a bonding mechanism that helps different parts of an organization to integrate or to combine resources' (Tsai and Ghoshal, 1998, p. 467). Organization members who share a vision will be more likely to become partners sharing or exchanging their resources. The common goals, interests, visions that members of community share will help them see the meaning of their knowledge sharing, which in turn increases the quantity and quality of their knowledge sharing. We used shared language and shared vision together in this research. It is a result of their great integration in our measurement tool.

**H6a.** Shared language and vision are associated with the attitude and expectations about knowledge sharing.

**H6b.** Shared language and vision are associated with the quality of knowledge sharing.

### **3.7. *Attitude and expectations about knowledge sharing***

Personal attitudes toward a behavior are a significant predictor of intention to engage in that behavior or not. Behavioral intention to share knowledge is determined

by a person's attitude toward knowledge sharing (Chow and Chan, 2008). Outcome expectations refer to an individual's belief that task accomplishment leads to a possible outcome. Personal outcome expectations refer to the knowledge contributor's judgment of likely consequences that his or her knowledge sharing behavior will produce to him or herself (Chiu *et al.*, 2006). In this study, as a result of their resemblance in meaning and effect on knowledge sharing, we used the both concept as a single factor to examine the personal behavior about knowledge sharing.

**H7.** Attitude and expectations about knowledge sharing associated with the quality of knowledge sharing.

### **3.8. Quality of knowledge sharing**

We used quality of knowledge sharing in our research as an indicator of productivity that an organization can gain through knowledge sharing. We consider six items for quality of shared knowledge: relevance, ease of understanding, accuracy, completeness, reliability, and timeliness.

## **4. Research methodology and analysis**

We adopted a survey method for data collection and examined the hypotheses using step-wise multiple regression and Hierarchical regression on the data.

### **4.1. Measurement development**

We developed measurement items by adopting measures that had been validated in prior studies, modifying them to fit our context of research. Appendix A lists the questions with their statistical information.

For measuring the six factors of social capital we used the works of Chiu *et al.* (2006) and Wah *et al.* (2007) as a base of our questionnaire and modified the questions wherever it was necessary. For measuring the two factors of knowledge sharing we used the works of Chiu *et al.* (2006) and Chow and Chan (2008) as a base of our questionnaire and modified the questions wherever it was necessary. The works of Chiu *et al.* (2006), Wah *et al.* (2007) and Chow and Chan (2008), all based on some previous researches and validated. Before using the questionnaire, we presented it to three professors to assess its logical consistencies, ease of understanding, sequence of items, and contextual relevance. We also performed a pretest of it. The comments collected from these experts and respondents led to several minor modifications of the wording. For all the measures, a six-point Likert scale was adopted with anchors ranging from strongly disagree (1) to strongly agree (6).

### **4.2. Data collection**

The study sample consisted of personnel of the research center of IRIB. Research center of IRIB is a department which works specially in social concepts. Most of the personnel are researcher with BS and MS degrees who works in their field of study. Nature of the works in this center is compatible with the concept of knowledge sharing.

For computing the minimum number of questionnaires that is required for testing the hypotheses, we used the Cochran's formula for continues data (Cochran, 1977).

$$\underline{n}_0 = \frac{t^2 * s^2}{d^2} = \frac{1.96 * 1.2^2}{6 * 0.03} = \frac{5.531904}{0.0324} \approx 170$$

$$\underline{n}_1 = \frac{\underline{n}_0}{(1 + \frac{\underline{n}_0}{Population})} = \frac{170}{(1 + \frac{170}{200})} = \frac{170}{1.85} \approx 92$$

We distributed the questionnaire between all members of the center. We got back a total of 148 replies, though four were incomplete and so discarded. Thus, 144 questionnaires were used for the data analysis, a response rate of 72%. Table 2 shows the demographics of the respondents.

### **4.3. Questionnaire data analysis**

We first analyzed the convergent validity of constructs, and then the reliability of our measurement items and at the last stage tested our hypotheses.

#### **4.3.1. Construct validity**

Construct validity refers to whether a scale measures or correlates with a theorized psychological construct. A construct is not restricted to one set of observable indicators or attributes. It is common to a number of sets of indicators. Thus, construct validity can be evaluated by statistical methods that show whether or not a common factor can be shown to exist underlying several measurements using different observable indicators. We used confirmatory factor analysis (CFA) to assess the construct validity of the eight scales (Social interaction ties, trust, identification, norm of reciprocity, open-mindedness, shared language and vision, attitude and expectations about knowledge sharing, quality of knowledge sharing) with SPSS. As a result of CFA two questions was removed from our questionnaire. All questions have a factor loading over 0.6, which is sufficient with our sample size according to Stevens (1992) and Field (2005).

#### **4.3.2. Reliability test**

Reliability is the consistency of a set of measurements or measuring instrument, often used to describe a test. We used Cronbach's  $\alpha$  to test the reliability of our questionnaire. Cronbach's  $\alpha$  (alpha) is commonly used as a measure of the internal consistency reliability of a psychometric instrument. Cronbach's  $\alpha$  measures how well a set of variables or items measures a single, unidimensional latent construct. We calculate the Cronbach's  $\alpha$  for all scales by SPSS and all of them have a score over 0.82; these are greater than 0.7 and thus the constructs were considered reliable. Table 3 shows the result of construct validity and reliability test.

**Table 2:** Demographic information of respondents

Measure	Items	Frequency	Percent
Gender	Male	63	43.7
	Female	80	55.6
	Missing	1	0.7
Age	21-25	3	2.1
	26-30	12	8.3
	31-35	51	35.4
	36-40	42	29.2
	41-45	23	16
	46-50	10	6.9
	Missing	3	2.1
Education	2-year college	4	2.8
	BSc	57	39.6
	MSc	73	50.7
	PhD	6	4.2
	Missing	4	2.8
Job Title	Researcher	69	47.9
	Research staff	37	25.7
	Manager	12	8.3
	System expert	8	5.6
	Technical expert	8	5.6
	Other	2	1.4
	Missing	8	5.6
Job is related to field of study	Yes	105	72.9
	No	36	25
	Missing	3	2.1

**Table 3:** Result of construct validity and reliability test

Factors (abbreviation)	Factor Loading	$\alpha$	Items
Social interaction ties (SIT)	0.71-0.88	0.81	4
Trust (T)	0.62-0.83	0.89	5
Identification (I)	0.77-0.95	0.93	4
Norm of Reciprocity (NR)	0.81-0.86	0.85	2
Open-Mindedness (OM)	0.70-0.75	0.88	3 (4)
Shared Language and Vision (SLV)	0.60-0.82	0.82	5 (6)
Attitude and Expectations about Knowledge Sharing (AEKS)	0.61-0.90	0.95	11
Quality of Knowledge Sharing (QKS)	0.70-0.92	0.92	6

#### 4.3.3. Testing Hypotheses

For testing our hypotheses we used the multiple regressions. Since in all of the hypotheses, except **H7**, the social capital factors have a relation with attitude and expectations about knowledge sharing, and quality of knowledge sharing, two multiple regressions is sufficient for all of them (Irwin, 2006). For testing hypothesis **H7** we used hierarchical regression to see the exact effect of attitude and expectations about knowledge sharing on quality of knowledge sharing.

Table 4 shows the correlation between variables.

**Table 4:** Correlation between variables

	SIT	T	I	NR	OM	SLV	AEKS	QKS
SIT	1							
T	0.176*	1						
I	0.186*	0.448**	1					
NR	0.234**	0.477**	0.444**	1				
OM	0.104	0.604**	0.405**	0.426**	1			
SLV	-0.116	0.383**	0.313**	0.309**	0.456**	1		
AEKS	0.149	-0.066	0.218**	0.221**	0.007	0.327**	1	
QKS	0.081	0.166*	0.212*	0.261**	0.142	0.500**	0.581**	1

\*  $p < 0.05$   
\*\*  $p < 0.01$

#### 4.3.3.1. Testing the associations of social capital factors with attitude and expectations about knowledge sharing

For testing hypotheses **H1a**, **H2a**, **H3a**, **H4a**, **H5a**, and **H6a** we used a step-wise multiple regression. Those Independent variables (IV) which enters the final model of predicting the dependent variable (DV), will supported their related hypotheses and other will fail. We used step-wise multiple regression to reduce the effect of useless IVs on  $R^2$ . Table 5 shows the result of multiple regressions in SPSS.

Table 5 shows that shared language and vision ( $\beta=0.484$ ), Trust ( $\beta=-0.387$ ), Social interaction ties ( $\beta=0.226$ ), and norm of reciprocity ( $\beta=0.203$ ) have associations with attitude and expectations about knowledge sharing, but identification and open-mindedness couldn't enter in any model and so they have no associations. We concluded that hypotheses **H1a**, **H2a**, **H4a**, and **H6a** were supported and hypotheses **H3a**, and **H5a** were rejected.

#### 4.3.3.2. Testing the associations of social capital factors with quality of knowledge sharing

For testing hypotheses **H1b**, **H2b**, **H3b**, **H4b**, **H5b**, and **H6b** we used a step-wise multiple regression. Table 6 shows the result of multiple regressions in SPSS.

Table 6 shows that only shared language and vision ( $\beta=0.500$ ) has association with quality of knowledge sharing, but social interaction ties, trust, identification, norm of reciprocity, and open-mindedness couldn't enter in any model and so they have no associations. We concluded that hypothesis **H6b** was supported and hypotheses **H1b**, **H2b**, **H3b**, **H4b**, and **H5a** were rejected.

**Table 5:** Result of multiple regressions for attitude and expectations about knowledge sharing

Model	<i>R</i>	<i>R</i> <sup>2</sup>	Adjusted <i>R</i> <sup>2</sup>	<i>R</i> <sup>2</sup> Change	Unstandardized Coefficient		Standardized Coefficient	<i>t</i>	Sig.	
					B	Std. error	$\beta$			
1	Const.	0.372	0.138	0.132	0.138	37.135	3.124		11/887	0.000
	SLV					0.809	0.169	0.372	4.775	0.000
2	Const.	0.435	0.189	0.178	0.051	40.323	3.225		12.503	0.000
	SLV					1.011	0.178	0.465	5.669	0.000
	T					-0.428	0.144	-0.244	-2.971	0.003
3	Const.	0.504	0.254	0.238	0.065	30.606	4.167		7.346	0.000
	SLV					1.135	0.175	0.522	6.475	0.000
	T					-0.548	0.143	-0.312	-3.836	0.000
	SIT					0.564	0.161	0.265	3.496	0.001
4	Const.	0.533	0.284	0.263	0.030	27/683	4.275		6.475	0.000
	SLV					1.052	0.176	0.484	5.978	0.000
	T					-0.680	0.151	-0.387	-4.506	0.000
	SIT					0.482	0.162	0.226	2.967	0.004
	NR					0.911	0.380	0.203	2.937	0.018

**Table 6:** Result of multiple regressions for quality of knowledge sharing

Model	<i>R</i>	<i>R</i> <sup>2</sup>	Adjusted <i>R</i> <sup>2</sup>	<i>R</i> <sup>2</sup> Change	Unstandardized Coefficient		Standardized Coefficient	<i>t</i>	Sig.	
					B	Std. error	$\beta$			
1	Const.	0.500	0.250	0.245	0.250	12.188	1.647		7.399	0.000
	SLV					0.614	0.089	0.500	6.877	0.000

4.3.3.3. *Testing the association of attitude and expectations about knowledge sharing with quality of knowledge sharing*

For testing hypothesis **H7** we used hierarchical regression to see the exact effect of attitude and expectations about knowledge sharing on quality of knowledge sharing. Attitude and expectations about knowledge sharing is a DV of social interaction ties, trust, identification, norm of reciprocity, open-mindedness, and shared language and vision. So we entered the social capital factors in the first step of hierarchical regression (in step-wise), and then entered the attitude and expectations about knowledge sharing in the second step. Table 7 shows the result of hierarchical regression in SPSS.

Table 7 shows that attitude and expectations about knowledge sharing ( $\beta=0.459$ ) has association with quality of knowledge sharing. So hypothesis **H7** was supported. It also shows us that shared language and vision have influence on the quality of knowledge sharing directly and indirectly.

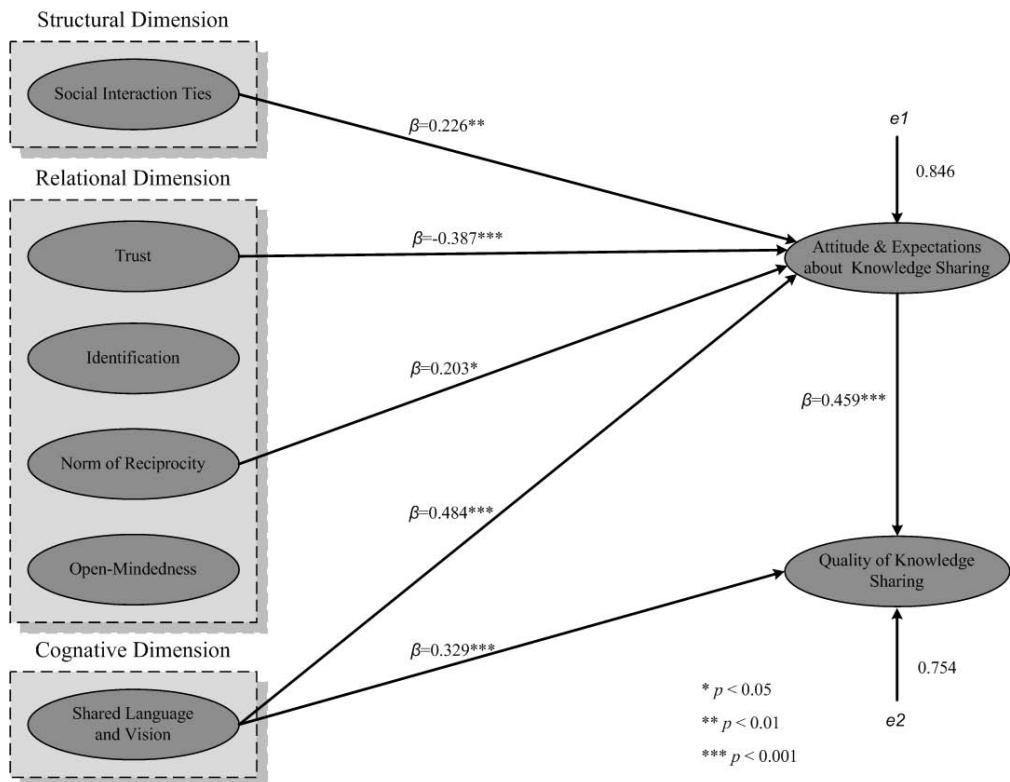
**Table 7:** Result of hierarchical regression (in two step)

Model	<i>R</i>	<i>R</i> <sup>2</sup>	Adjusted <i>R</i> <sup>2</sup>	<i>R</i> <sup>2</sup> Change	Unstandardized Coefficient		Standardized Coefficient	<i>t</i>	Sig.	
					B	Std. error	<i>b</i>			
1	Const.	0.500	0.250	0.245	0.250	12.188	1.647		7.399	0.000
	SLV					.614	.089	.500	6.877	0.000
2	Const.	0.657	0.431	0.423	0.181	2.558	2.033		1.258	0.210
	SLV					.404	.084	.329	4.811	0.000
	AEKS					.259	.039	.459	6.707	0.000

#### 4.3.4. Effects of social capital factors on knowledge sharing

Path analysis, is an extension of the multiple regression procedures that can neither confirm nor reject the hypothetical causal imagery, but provide quantitative estimates of the causal connections between sets of variables (Bryman and Cramer, 2005).

By considering all the result from testing hypotheses, we came to a path analysis diagram for effecting social capital factors on knowledge sharing (Figure 2). We omitted the insignificant effects in this path analysis. It shows that social interaction ties, trust, norm of reciprocity and shared language and vision have a direct effect on attitude and expectations about knowledge sharing. Also social interaction ties, trust, norm of reciprocity and shared language and vision have an indirect effect on quality of knowledge sharing through attitude and expectations about knowledge sharing. Shared language and vision has the strongest effect between other factors on attitude and expectations about knowledge sharing and quality of knowledge sharing. By considering the correlations between social capital factors (Table 3), and effects of factors on other factor, we can say that almost all of the social capital factors can have an effect on knowledge sharing.



**Figure 2:** Path analysis for the effects of social capital factors on knowledge sharing

## **5. Discussions and implications**

Our main objective was to understand the influence of social capital on organizational knowledge sharing. Our results revealed that:

- Social interaction ties, norm of reciprocity, and shared language and vision significantly contributed to attitude and expectations about knowledge sharing.
- Trust associated negatively with attitude and expectations about knowledge sharing. It may seem odd at first glance, and make a suspicion about the validity of the survey. Controlling the questions and the result show no error. Also considering the correlation of trust with other factors of relational dimension, assure us that there is no problem with data. After reviewing the questions of trust again, we came to a new conclusion: trust can lead to a better perception of people. By a better perception of other's behavior about knowledge sharing, people have a clearer feeling about their attitude and expectations about knowledge sharing. And by considering the Iranian's individualism score on Hofstede's cultural dimensions (IDV=41), it also become clear why people with low score on trust have high score on attitude and expectations about knowledge sharing; the tendency to collectivism and good feeling about group activities.
- Shared language and vision significantly contributed to quality of knowledge sharing.
- Attitude and expectations about knowledge sharing significantly contributed to quality of knowledge sharing.
- Social capital has a noticeable effect on knowledge sharing (specifically on attitude and expectations, and quality).

## **6. Conclusion and limitations**

Our study was one of the empirical evidence about the influence of a structural, relational, and cognitive dimension of social capital on employees' intention to share knowledge and the quality of knowledge that shared in organization. It offers insights to practitioners on the value of social capital and reasons why people are or are not willing to engage in knowledge sharing within an organization.

We also found that shared language and vision is the most critical factor in knowledge sharing, by having a strong effect on both attitude and expectations, and quality of knowledge. Since it is more convenient for organizations to reinforce shared language and shared vision, it can be a proper policy to invest in cognitive dimension's factors of social capital.

This study has a few inherent limitations. First, we hypothesized only six social capital factors in our model; other social capital factors (such as network configuration, appropriable organization, shared narratives) may also affect outcomes. Second, there are so many different ways to measure knowledge sharing (such as tacit and explicit knowledge sharing, kind of knowledge sharing activity, quantity of knowledge sharing); considering these scale may lead to different result for the importance of social capital factors in knowledge sharing. Third, there are so many other variables

that can moderate the relationship of social capital with knowledge sharing (such as personality, type of work). Forth and last, our research was carried out in a research center of a governmental organization in Iran; so it's very hard to generalize the results.

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