Knowledge Sharing in Non-Knowledge Intensive Organizations: When Social Networks do not Matter?

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KNOWLEDGE SHARING IN NON-KNOWLEDGE INTENSIVE ORGANIZATIONS: WHEN SOCIAL NETWORKS DO NOT MATTER?

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ABSTRACT

Considerable attention has been paid to the network determinants of knowledge sharing. However, most, if not all, of the studies investigating the determinants of knowledge sharing are either focused on knowledge-intensive organizations such as consultancy firms or R&D organizations, or knowledge workers in regular organizations, while lesser knowledge intensive organizations or non-knowledge workers are rarely explored. This is a gap in the literature on social networks and knowledge sharing. In this paper, the relations between network determinants and actor determinants of knowledge sharing are empirically tested by means of a network survey in a less knowledge intensive organization, specifically employees of a Dutch department store chain. The results show that individual-level variables such as departmental commitment and enjoyment in helping others are the major determinants of individuals' knowledge sharing behavior, but none of the social network variables play a role. The results thus present an important boundary condition to social networks effects on knowledge sharing: social networks only seem to play a role in knowledge sharing for knowledge workers, not for blue-collar workers.

INTRODUCTION

An increasing number of researchers as well as organizations understand the strategic importance of knowledge and it is considered a significant organizational resource for organizations (Alavi and Leidner, 2001; Grant, 1996; Osterloh and Frey, 2000; Spender, 1996). Because of its value for organizations, as it increases performance, many studies have investigated the determinants of knowledge sharing in an attempt to discover which factors increase or decrease knowledge sharing. Thus, considerable attention has been paid to the determinants of knowledge sharing, which are quite diverse. In literature, factors affecting knowledge sharing are explored from different perspectives. For instance, several studies are focused solely on motivational determinants of knowledge sharing (Burgess, 2005; Lin, 2007a), while others extend this by exploring perceived organizational determinants and IT related determinants (Cabrera et al., 2006; Van den Hooff and De Leeuw van Weenen, 2004). The former studies solely investigated the individual level determinants. On the contrary, other studies investigated network related determinants of knowledge sharing (Aalbers et al. 2005; Cross et al., 2001; Newell et al., 2004; Tsai, 2002). Thus, the factors or determinants of knowledge sharing are widely described in literature.

Interestingly though, most, if not all, of the studies investigating the determinants of knowledge sharing are focused on knowledge intensive organizations in general or only on knowledge workers in particular, while lesser knowledge intensive organizations or non-knowledge workers are rarely explored. For example, Cross et al. (2001) studied informal networks and knowledge sharing in several organizations – such as a pharmaceutical company, a consulting firm, a

manufacturing organization and many more – within different industries. Within these organizations, Cross et al. (2001) mainly focused on executives and units where knowledge intensive work and complex problem solving are present, leaving individuals and units with lesser knowledge intensive work and lesser complex problem solving outside the scope of the study. Although the determinants of knowledge sharing in knowledge intensive organizations are widely described, the concepts may also be relevant for less knowledge intensive organizations. As individuals on an operational level in less knowledge intensive organizations are not considered to execute complex tasks and do not extensively create knowledge, they are mostly dependent on the knowledge they absorb to execute tasks. Without knowledge sharing, individuals do not obtain the knowledge they need to execute tasks. Therefore the factors affecting knowledge sharing are potentially important for less knowledge intensive organizations as well.

This is where this study contributes, by investigating knowledge sharing networks in a less-knowledge intensive organization, namely among shopfloor employees of 2 branches of a department store. We find that, contrary to past findings, none of the network-related variables help to explain knowledge sharing behaviors, which is instead determined solely by individual-level factors, primarily organizational commitment and enjoyment in helping others. These results provide an important boundary condition for network-based explanations of knowledge sharing.

THEORY

Knowledge workers, non-knowledge workers and (non-)knowledge intensive organizations.

The focus of this study is on workers in less knowledge intensive organizations, i.e. non-knowledge workers. Thus, a definition of the concept knowledge worker is necessary in order to determine what a non-knowledge worker is. The concept knowledge worker is a term that is first used by Drucker (1959). According to Drucker (1959), the knowledge worker includes those with professions in the IT sector and also researchers, lawyers, teachers and so forth. In addition, what distinguish them from common workers is that a knowledge worker's foremost need and output is knowledge. Since then, several other researchers have defined the concept, of which some have narrowed the definition to a more understanding meaning while others define the concept in terms of certain professions using knowledge.

For instance, Davis et al. (1991) define knowledge work as 'a set of activities using individual and external knowledge to produce outputs characterized by information content'. Davenport et al. (1996) broaden the concept, according the Davenport et al. (1996) knowledge work's primary activity is the acquisition, creation, packaging, or application of knowledge. It is performed by professionals or technical workers with a high level of skill and expertise. In addition, knowledge work processes include such activities as research and product development, advertising, education, and professional service like law, accounting and consulting. Management processes such as strategy and planning are also considered knowledge work by Davenport et al. (1996). However, according to Scarbrough (1999), one cannot determine that knowledge workers are active in certain professions. Instead, knowledge workers can be defined by the work or activities they execute. According to Scarbrough (1999), knowledge workers work with their own knowledge, with knowledge of other knowledge workers and with organizational and technical

knowledge. On the contrary, ‘non-knowledge workers work from knowledge, using a specific occupationally-defined body of expertise’ (Scarbrough, 1999).

In line with this, we define knowledge workers as employees that carry out primarily knowledge activities with knowledge as input as well as knowledge as output and non-knowledge workers as those for whom this is not the case. So while non-knowledge workers may still work with knowledge in their job, it is not their primary activity. Blackler (1995) defines a knowledge intensive organization as organizations staffed by a high proportion of highly qualified staff trading in knowledge itself, i.e. knowledge workers. Consequently, we define a non-knowledge-intensive organization as one staffed by a low proportion of knowledge workers (but note that a non-knowledge intensive organization may of course still contain parts that could be characterized as knowledge-intensive , such as a top management team).

Many factors exist that affect knowledge sharing which are analyzed on different levels of analysis. Although there may be differences among these factors, the determinants of knowledge sharing can be divided into a few main categories, which we divide into individual level and network level-factor. Individual level factors focuses on individual related aspects, such as motivational, organizational, and IT related factors. Network level factors refer to features of social networks (although it should be noted that we do relate these features, e.g. centrality, back to the individual, but while technically this makes them individual-level factors, we group them under network-level factors since they are derived from the larger network in which the individuals are embedded). Furthermore, although past research has tended to treat knowledge sharing as a symmetric concept, we distinguish between the demand side and the supply side of knowledge, by looking at both knowledge collecting behavior and knowledge donating behavior. in this study, knowledge collecting refers to ‘consulting others to get them to share their

knowledge' and knowledge donating refers to 'communicating one's knowledge to others' (Van den Hooff and De Ridder, 2004, see also Ardichvili et al. 2003).

Organizational commitment. Research has shown that commitment affects several behaviors and attitudes (Meyer et al., 1993; O'Reilly and Chatman, 1986). Furthermore, various studies have explored the relation between commitment and knowledge sharing such as Cabrera et al. (2006), Kelloway and Barling (2000), Smith and McKeen (2002) and Van den Hooff and De Leeuw van Weenen (2004). the results of the research of Van den Hooff and De Leeuw van Weenen (2004) and Cabrera et al. (2006) indicate that an employee is more willing to engage in knowledge sharing when this person has a high degree of commitment to the organization. The reasoning behind this relationship is that a greater commitment to an organization by a person produces the belief that the organization and other employees have rights to a person's knowledge and therefore increases more communication and in return increases that person's donating of own knowledge as well as collecting of knowledge (Jarvenpaa and Staples, 2001). As it has been evident that organizational commitment affects behaviors, attitudes and especially knowledge sharing in knowledge intensive organizations and as it is stated that possible future research should investigate the relationship in more detail, it is expected that the effect of organizational commitment on knowledge sharing also applies to less knowledge intensive organizations. This leads to the following hypotheses:

H1a: Organizational Commitment has a positive effect on knowledge collecting.

H1b: Organizational Commitment has a positive effect on knowledge donating.

Departmental commitment. While commitment can be to the organization as a whole, an employee may also be committed to his or her department. A greater commitment to the department increases the belief that other employees have rights to a person's knowledge and therefore increases an employee's collecting of other knowledge and donating of own knowledge. In addition, the more an employee is committed to a department, the more that person is motivated to behave in the interest of the department by sharing own knowledge with other employees and collecting more knowledge from others (Burgess, 2005). Based on this reasoning and the findings of Van den Hooff and De Leeuw van Weenen (2004) in knowledge-intensive organizations, , it is expected that the effect of departmental commitment on knowledge sharing behavior is also present in less knowledge intensive organizations.This leads to the following hypotheses:

H2a: Departmental Commitment has a positive effect on knowledge collecting.

H2b: Departmental Commitment has a positive effect on knowledge donating.

Relative departmental commitment. According to Burgess (2005), an employee can be committed to different groups within the organization. The existence of commitment to different groups can hinder knowledge sharing. For instance, Burgess (2005) and Fisher et al. (1997) found that more identification with a unit/department, relative to organizational identification, is associated with less knowledge collecting and knowledge donating. The reasoning behind this is that more identification with the department leads to more competition between groups and therefore less knowledge sharing (Burgess, 2005; Tsai, 2002). For clarification, the extent to which a person identifies himself/herself with the department compared with identification with

to the organization as a whole refers here to the concept ‘relative departmental commitment’ and leads to the following hypotheses:

H3a: Relative Departmental Commitment has a negative effect on knowledge collecting.

H3b: Relative Departmental Commitment has a negative effect on knowledge donating.

Knowledge self-efficacy. In literature, it is widely recognized that intrinsic motivators such as self-efficacy influences behaviors (Bandura, 1997) and even knowledge sharing behavior (Bock and Kim, 2002; Kankanhalli et al., 2005; Osterloh and Frey, 2000). In line with the relationship between self-efficacy and behaviors, Cabrera et al. (2006) analyzed the relationship between self-efficacy and knowledge sharing and found a positive correlation between the constructs. Hsu et al. (2007) and Lin (2007a) conducted the same research and found similar results. Cabrera et al. (2006), Hsu et al. (2007) and Lin (2007a) rationalize that employees who believe to possess helpful knowledge for other employees are more inclined to share their knowledge with other employees. In addition, employees that believe to have the capabilities to share knowledge with others, also collect knowledge from others to enhance their own knowledge-self-efficacy or confidence to provide useful knowledge to other employees. On the contrary, an employee that believes being incapable of having useful knowledge will favor knowledge sharing less often due to the believe that their knowledge is not valuable for others or the organization. Thus, employees with a high degree of knowledge self-efficacy, which is high perceived capability by oneself to provide valuable knowledge, are more likely to collect knowledge from other employees (knowledge collecting) and share their own knowledge with other employees (knowledge donating). Thus, this leads to the following hypotheses:

H4a: Knowledge Self-efficacy has a positive effect on knowledge collecting.

H4b: Knowledge Self-efficacy has a positive effect on knowledge donating.

Enjoyment in helping others. Enjoyment in helping others is seen as another form of intrinsic motivation that may affect knowledge sharing(Kankanhalli et al., 2005; Lin, 2007a). Several studies have addressed the relationship between enjoyment in helping others as an intrinsic motivator and knowledge sharing behavior (McLure Wasko and Faraj, 2000; McLure Wasko and Faraj, 2005). In addition, research by Lin (2007a) indicate that people who are intrinsically motivated, especially, enjoy helping others by contributing their knowledge, will be more inclined to engage in knowledge sharing behavior within knowledge intensive organizations3. The reasoning behind this relationship is that knowledge sharing by an employee increases satisfaction due to his/her degree of altruistic behavior (McLure Wasko and Faraj, 2000). In more detail, altruistic motivated employees feel a form of satisfaction when they help others and therefore share more knowledge with others. Based on these results, it is hypothesized that:

H5a: Enjoyment in Helping Others has a positive effect on knowledge collecting.

H5b: Enjoyment in Helping Others has a positive effect on knowledge donating.

Reciprocity. According to the literature, relational motivations of people affect their knowledge sharing behavior (Burgess, 2005; Perlow and Weeks, 2002). One of these relational motivations is motivation by reciprocity norms, which refers to a situation where a knowledge exchange relationship is based on the expectation that the knowledge receiver will pay benefits back to the

knowledge giver. The more people are motivated by reciprocity norms, the less they will act in the interest of others, and the more likely they are to be helpful to only those colleagues to be valuable sources of knowledge. Due to this reasoning, a person with a high degree of perceived motivation by reciprocity norms will only share knowledge with a few helpful sources and therefore decreases that person's knowledge donating to other less helpful colleagues, and moreover, the less he/she collects knowledge because someone could ask for knowledge in return. Thus:

H6a: Motivation by Reciprocity Norms has a negative effect on knowledge collecting.

H6b: Motivation by Reciprocity Norms has a negative effect on knowledge donating.

Support from supervisors and co-workers. Based on the theory of planned behavior, people tend to behave in certain ways when important and influential individuals within the organization approve this behavior (Azjen and Fishbein, 1980). Several studies have investigated the relationship between support from supervisors and co-workers and several attitudes and/or behaviors (Amabile et al., 1996; Cabrera et al., 2006; Noe and Wilk, 1993). Cabrera et al. (2006) investigated the relationship between support from supervisors and coworkers and knowledge sharing behavior within a knowledge intensive organization. According to Cabrera et al. (2006), the more a person perceives approval of knowledge sharing behavior by its supervisors and co-workers, the more a person will engage in knowledge sharing behavior due to the pressure of this subjective norm, and thus is more inclined to collect knowledge from others and donate knowledge with others within the organization. Thus, it is hypothesized:

H7a: Support from Supervisors and Co-workers has a positive effect on knowledge collecting.

H7b: Support from Supervisors and Co-workers has a positive effect on knowledge donating.

Organizational centralization. Although most of the former factors focus on the motivational dimension of knowledge sharing, other dimensions are also important for consideration. Next to motivations, organizational structure is addressed by several studies as an important dimension affecting knowledge sharing (Bock et al., 2005; Cabrera et al., 2006; Kim and Lee, 2006). It is addressed in literature that more hierarchical organizations, i.e. more centralized organizations, tend to hinder knowledge sharing and creation (Tsai, 2002). The reasoning behind this assumption is that more centralization within an organization creates a situation where vertical communication and vertical knowledge sharing between employees is common. However, more centralization prevents employees to share knowledge horizontally due to the centralized structure which dictates vertical communication. As a result, an employee in a highly centralized organization has less opportunities to share knowledge and in return will not be interested in providing its knowledge to other employees (horizontal knowledge sharing) unless a supervisor requires the employee to do so. Thus, more centralization reduces the opportunities to share knowledge with other employees and collect knowledge from other employees. In addition, reducing the opportunities to share and collect knowledge creates inactive roles of employees which further reduce knowledge sharing among employees (Kim and Lee, 2006), since the more a person perceives that power and authority are concentrated at the organization's higher levels, the less a person has knowledge sharing capabilities, and the less a person collects knowledge from and donates knowledge with other employees. We thus have:

H8a: Perceived Centralization has a negative effect on knowledge collecting.

H8b: Perceived Centralization has a negative effect on knowledge donating.

Formalization. Another important aspect of the organizational structure dimension is formalization. Many studies have addressed the importance of a diminished degree of formalization within organizations. Less formalization, that is less formal rules and regulations, are necessary for effective knowledge management (Holsapple and Joshi, 2001) and enables knowledge sharing and knowledge creation by creating opportunities for employees to communicate with each other (Jarvenpaa and Staples, 2000). The reasoning behind the negative relationship between formalization and knowledge behavior is that more formalization creates an environment where employee activities become standardized. Due to this standardization of work, the necessity to discuss or communicate with other employees becomes superfluous, and in return reduces collecting knowledge from and donating knowledge with each other. We therefore have:

H9a: Perceived Formalization has a negative effect on knowledge collecting.

H9b: Perceived Formalization has a negative effect on knowledge donating.

IT usage. IT has been an important subject in the literature of knowledge sharing. Many studies have addressed the relationship between IT and knowledge sharing (Huysman and De Wit, 2002; Kim and Lee, 2006; Moffett et al., 2003; Ruggles, 1998; Van den Hooff and De Leeuw van Weenen, 2004). More specifically, IT leads to more means of communication and thus more ways of sharing knowledge. Furthermore, IT in the form of intranets within organizations can

also be a source of knowledge and information for employees. Thus, the usage of IT by employees enhances their knowledge and information and could furthermore increase their knowledge sharing behavior. Van den Hooff and De Leeuw van Weenen (2004) investigated the relationship between IT usage, in the form of intranet and e-mail usage, and knowledge sharing behavior. According to the study, IT usage positively affects employees' knowledge sharing behavior. Kim and Lee (2006) found similar results. Empirical analysis of Kim and Lee (2006) indicate that employees with higher levels of IT application utilization were positively associated with higher levels of employee knowledge sharing. However, other studies have found contradicting results. For instance, Bock and Kim (2002) analyzed how the level of IT usage affects knowledge sharing behavior and concluded that it did not had an effect on knowledge sharing behavior. Although the effect of IT usage on knowledge sharing behavior and the empirical findings are mixed, Brown and Duguid (2001) address these contradicting findings and concluded that in situations where common know-how exists, knowledge sharing behavior can be most valuable. Thus, based on the assumption that common know-how exists and knowledge is not specialized in less knowledge intensive organizations, and in line with the findings of Brown and Duguid (2001), it is assumed that these findings and hypothesis, i.e. a positive relationship between IT usage and knowledge sharing behavior, also hold for this study:

H10a: IT Usage has a positive effect on knowledge collecting.

H10b: IT Usage has a positive effect on knowledge donating.

Individual network position. Next to the identification of the individual determinants of knowledge sharing, another stream of literature focuses on the network effects on knowledge

sharing. According to Van Wijk et al. (2008), the main individual level network characteristic affecting knowledge sharing is network position. Based on a meta-analysis, Van Wijk et al. (2008) concluded that centrally located actors in a network acquire or share more knowledge. Thus, a higher central network position is related to increased knowledge sharing. Although the actors under study may differ, all of the studies indicate a positive relationship between network position, in the form of betweenness centrality, and knowledge sharing. The studies of Van Wijk et al. (2008) and Tsai and Ghoshal (1998) solely investigated the relationship between network position and knowledge sharing as a general knowledge sharing factor. Other studies focused solely on the relationship between network position and one aspect of knowledge sharing, i.e. a form of knowledge collecting or knowledge donating. For instance, according to Tsai (2001), centrally located actors have better access to new knowledge and more knowledge sources, and thus the more an actor collects knowledge. In addition, Hansen (2002) found a positive relationship between network centrality and the amount of knowledge obtained, which is also a form of knowledge collecting. Thus, network centrality positively affects knowledge collecting.

On the knowledge donating side, the study of McLure Wasko and Faraj (2005) indicated that individuals with higher network centrality are more likely to share knowledge with others, thus an individual's network centrality positively affects a person's knowledge donating behavior. In addition, Cummings (2003) argues that individuals embedded within a network enhances social ties, and in turn, creates opportunities to share knowledge with others i.e. knowledge donating. The study of Cross and Cummings (2004) confirms the effects of betweenness centrality on both knowledge seeking and knowledge transfer. As the relationship between individual network position, in the form of betweenness centrality, and knowledge collecting and knowledge donating is evident, it is further important to determine in which networks an individual's

network position affects the two types of knowledge sharing behaviors. Hansen (2002) and Tsai (2001) both focused on advice networks. Similarly, Cross and Cummings (2004) used an information or advice network. Tsai and Ghoshal (1998) investigated the social or friendship network to investigate the relationship between network position and knowledge sharing.

Furthermore, although the empirical studies did not investigate the formal network, several studies have mentioned the importance of formal networks for sharing knowledge within organizations (O'Dell and Grayson, 1998; Aalbers et al, 2010). For this reason, the formal network will also be investigated in this study. Furthermore, it is often assumed that knowledge sharing is important for knowledge intensive organizations as they work foremost with knowledge or to some higher degree of knowledge than less knowledge intensive organizations. As complex knowledge is more apparent in knowledge intensive organizations and simple knowledge in less knowledge intensive organizations, a distinction between an advice network related to simple knowledge and an advice network related to complex knowledge is made. This leads to the following hypotheses:

H11a: Centrality in a Simple Advice Network has a positive effect on knowledge collecting

H11b: Centrality in a Simple Advice Network has a positive effect on knowledge donating.

H12a: Centrality in a Complex Advice Network has a positive effect on knowledge collecting

H12b: Centrality in a Complex Advice Network has a positive effect on knowledge donating.

H13a: Centrality in a Friendship Network has a positive effect on knowledge collecting

H13b: Centrality in a Friendship Network has a positive effect on knowledge donating.

H14a: Centrality in a Formal Network has a positive effect on knowledge collecting

H14b: Centrality in a Formal Network has a positive effect on knowledge donating.

The effects on individual performance. According to Cross and Cummings (2004), performance is to some degree a product of obtaining the right information and thus, knowledge sharing positively affects individual performance: the more people collect knowledge, the more they know and the better they perform. For knowledge donating the relationship is more indirect: the more a person donates knowledge, the better that person behaves in cooperative behavior that benefits the organization as a whole, and this in turn increases individual performance. In sum, this leads to the following hypotheses:

H15: Knowledge collecting has a positive effect on Individual Performance.

H16: Knowledge donating has a positive effect on Individual Performance.

In short, we built on the literature on knowledge sharing in knowledge-intensive organizations to develop a similar model for non-knowledge intensive organization (reflecting the dominant, if implicit stance in the literature that these determinants are the same). The research model is summarized in figure 1.

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METHODOLOGY

Setting. To test the hypotheses for less knowledge intensive organizations, we conducted as survey at a Dutch organization specialized in retail. We study the Dutch department stores Vroom & Dreesmann (henceforth V&D). V&D is founded in 1887 and is the biggest department store in the Netherlands. There are approximately 61 V&D department stores and they can be found in all major cities across the Netherlands. Currently, V&D employs almost 12000 people.

As mentioned before, a knowledge intensive organization is here characterized as an organization with a high proportion of knowledge workers. Additionally, knowledge workers are characterized as employees with primarily knowledge activities with knowledge as input as well as output and are usually highly educated people. Although employees of the selected organization have to some extent knowledge activities with knowledge as input and output, it does not characterize their primary activities. Their primary activities concern customer service, that is, they sell products to the end customer and additionally provide service to customers. In addition, the major part of the employees is not highly educated and tasks are not complex. Due to this reasoning, employees of this organization are characterized as non-knowledge workers and the organization is characterized as non-knowledge intensive.

Concerning the presence of knowledge sharing within this organization, employees of this organization are dependent on their own knowledge, the knowledge from other colleagues and organizational documents to execute their job properly. Based on preliminary interviews with management personnel of both stores and several supervisors, knowledge within this organization can be described foremost as customer related knowledge, procedural knowledge, product knowledge, specific profession related knowledge, department specific knowledge and trend related knowledge. Additionally, employees improve their skills such as sales techniques and presentation skills by experience and share these experiences with other less skilled

employees. All of these different kinds of knowledge can be created by individual experiences or collected from others employees or documents. In order to do their job properly, a lot of these different kinds of knowledge are shared among the employees. Thus, employees in this organization create knowledge by experience, and share this new knowledge with others or share it when asked, which refers to knowledge donating. Other employees also possess relevant knowledge and therefore employees collect knowledge from each other, which refer to knowledge collecting. Overall, the selected organization is typified as a less knowledge intensive organization with a social interaction culture where different kinds of knowledge are shared between employees. Thus, this organization is suited for this study.

Survey procedure. We collected data at two locations, Dordrecht (V&DD) and Gorinchem (V&DG), although the results that we present in the analysis section will be aggregated across the two locations. The initial survey consisted of two parts, a list of questions that measured the individual level actor variables and several questions for the network level actor variables. Before the distribution of the surveys, the survey was translated into Dutch and pre-approved to reduce translation errors and pitfalls. In addition, to determine face validity and thus reduce ambiguity and difficult questions, the survey was pre-tested by several employees. The final survey consisted of a few demographic questions, 41 items and four egocentric network analysis questions. After the refinement of the survey, a cover letter was added to each survey with instructions and a short explanation of the research. Furthermore, it was explained on the cover how the employees themselves could benefit from the study. In addition, it was mentioned that participation was voluntary and all data remained confidential.

The survey was distributed on paper among all employees in both stores. The first author was present in both stores for several days. During these days, employees were gathered in groups of

3-4 people and they were allowed to fill in the survey in the meeting room. Although instructions were present on the cover letter, the employees were verbally instructed how to fill in the survey. Furthermore, this form of retrieving surveys gave the respondents the opportunity to ask questions regarding problematic issues and questions, none of which were major. Most surveys were filled in during these group sessions. However, there were also employees that were not present during these sessions. The remaining surveys were distributed among those employees by the store manager and/or floor manager and later collected from a letterbox by the first author.

There were 112 potential respondents for V&DD and 56 potential respondents for V&DG. From the 112 surveys that were distributed among the employees of V&DD, 90 completely filled out surveys were given back. This resulted in a response rate of 80.4%. From the 56 surveys that were distributed among the employees of V&DG, 52 valid surveys were given back. This resulted in a response rate of 92.9%. It was ensured that all key employees filled in the survey, especially those with a higher hierarchical function or important social function within the organization. Furthermore, all hierarchical levels within the organization are represented in the sample.

Measures. All individual-level constructs below were measured on a 7-point Likert scale (with the exception of IT usage) using previously validated multi-item scales from the literature. The appendix shows the measures for the most important constructs (space limitations prevent us from reproducing the full survey).

Organizational commitment. Organizational commitment was measured with four items adopted from Van den Hooff and De Leeuw van Weenen (2004). These items are originally part of the Organizational Commitment Questionnaire, a larger questionnaire for measuring organizational

commitment on different dimensions. The items were adopted from Porter et al. (1974) and Mowday et al. (1979) and used by Van den Hooff and De Leeuw van Weenen (2004) to measure a person's affective commitment, which is one dimension of organizational commitment.

Departmental commitment. The same items that measure organizational commitment are also used to measure departmental commitment, except that they are modified to refer to a department (being a sales subunit within a location, e.g. a department could be menswear or fragrances or books etc.) instead of the organization as a whole.

Relative departmental commitment. The independent variable relative departmental commitment is based on the formula of Fisher et al.(1997), which is also used in the study of Burgess (2005). According to original formula, a person's relative functional identification is calculated by dividing self-reported closeness to the department by self-reported closeness to the organization. In line with the formula, the relative departmental commitment score was calculated for each person by dividing departmental commitment by organizational commitment.

Knowledge self-efficacy. To measure knowledge self-efficacy, a four item scale was adopted from Lin (2007a). The items to measure knowledge self-efficacy originated from previous studies studying the self-efficacy construct (Jones, 1986; Spreitzer, 1995) and were modified by Lin (2007a) to more accurately reflect the knowledge sharing context.

Enjoyment in helping others. Enjoyment in helping others was measured with four items adopted from Lin (2007a) which in turn were derived from from McLure Wasko and Faraj (2000) study on helping others in electronic communities of practice.

Reciprocity. Four items were adopted from Burgess (2005) to measure motivation by reciprocity norms.

Support from supervisors and co-workers. The factor support from supervisors and co-workers is measured with three items adopted from Cabrera et al. (2006), originally developed by by Maurer and Tarulli (1994).

Centralization. To measure the variable centralization, a four item scale was adopted from Kim and Lee (2006), measuring 'perceptions of the degree to which power and authority are concentrated in the higher levels of their organization' (Hage & Aiken, 1967).

Formalization. The determinant formalization was assessed with four items adopted from research by Kim and Lee (2006), again derived from Hage and Aiken (1967).

IT usage. Two items are adopted from Van den Hooff and De Leeuw van Weenen (2004) to measure the variable IT usage during the daily work. The items were measured with a six-point frequency scale from 1 (don't use at all) to 6 (several times each day).

Network variables: centrality. In line with several other studies (Brass, 1984; Cross and Cummings, 2004; Levin and Cross, 2004), an egocentric network data collection technique has been used, that is, an individual was asked to write down the names of the employees by free recall. Four questions were adopted from previous studies, one for each network. In relation to the simple knowledge advice network, respondents were asked to 'identify the employees from whom they usually ask advice or help related to simple knowledge concerning work related subjects' and concerning the complex knowledge advice network respondents were asked to 'identify the employees from whom they usually ask advice or help related to complex knowledge concerning work related subjects' (Cross and Cummings, 2004; Hansen et al., 2005; Mehra et al., 2001; Podolny and Baron, 1997). Additionally, concerning the friendship network, employees were asked to 'identify the employees with whom they have a friendship' (Brass,

1984; Mehra et al., 2001; Tsai and Ghoshal, 1998), and in relation to the formal network employees were asked to 'identify the employees with whom they usually work' (Cross and Cummings, 2004; Mehra et al., 2001). The data was subsequently entered in UCINET 6 (Borgatti et al., 2002) to create the four networks for each respective locations (there was no overlap between the networks, all respondents indicated only employees within their own location), which were used to calculate betweenness centrality (in the network for that location) for each respondent.

Knowledge sharing – donating and collecting. Knowledge sharing, in the research model is divided into knowledge collecting and knowledge donating. Both knowledge collecting and knowledge donating are each measured with four items adopted from De Vries et al. (2006) and Van den Hooff and Hendrix (2004)

Individual performance The independent variable, individual performance, is measured with performance measurements developed by the organization itself. Two scales are employed by the organization to determine an employee's functional and competences performance, one for each type of performance. Both scales were measured with a five-point scale ranging from 1 (insufficient) to 5 (very good). An employee's total individual performance is calculated by a total performance scale, which is also measured with a five-point scale ranging from 1 (insufficient) to 5 (very good). Both functional and competences performance and total individual performance of employees were assessed by the organization (supervisors) in advance and independently of this study. Only scores of total individual performance were provided by the organization and hence used in this study.

Reliability and validity. The data was analyzed for convergent and divergent validity using factor analysis as well as calculation of Cronbach alpha. This resulted in the removal of two items from the knowledge self-efficacy scale, two items from the centralization scale and one item from the formalization that had substantial cross-loadings. The final items exhibited satisfactory factor loading patterns and all alpha values over 0.7 (with the exception of formalization with an alpha of 0.65).-In particular, the factor analysis showed that organizational commitment and departmental commitment were distinct variables, as were knowledge donating and knowledge collecting.

ANALYSIS

Results are reported for the combined sample (V&DT) of the two locations[1].

Descriptives and correlations. The descriptives can be found in Table 1 below, correlations in Table 2. Most of the sample is young and relatively inexperienced (both age and tenure are left-skewed), reflecting a large proportion of highschool students or college students doing this as a side job, but at the same time there is a substantial portion of the organization that is 40+ and has been with the organization for more than 15 years. Regarding gender, gender, 21.1% of the sample (N=142) is male and 78.9% is female. Other noteworthy observations from the descriptive analysis is that as expected, departmental commitment (i.e. to a sales subunit within that particular location) is somewhat higher than commitment to the overall organization. Also, the average scores for knowledge donating and knowledge collecting indicate that although

[1] We did do the same analysis also for each location separately, and while there seemed to be some differences between the two locations, the small sample for the Gorinchem location prevents us from making any strong claims in this regard. We therefore report only the results from the combined sample.

knowledge sharing is by no means a primary activity for a department store employee, they did engage in enough knowledge sharing behaviors to make studying knowledge sharing in a non-knowledge intensive organization a feasible endeavor (note that the scales asked for agree/disagree statements with exhibiting certain knowledge-sharing behaviors, not for proportion of time spent).

---------- INSERT TABLES 1 AND 2 AROUND HERE ----------

Hypothesis tests regarding knowledge sharing: OLS Regression

We tested the hypotheses regarding knowledge collecting and donating through OLS regression. Where necessary, non-normal variables were transformed and tolerance statistics were analyzed to check for multicollinearity. This analysis resulted in the removal of organizational commitment (which, although factorially distinct, correlated too highly with departmental commitment) and centrality in the complex advice network (which as can be seen in Table 2, correlated almost perfectly with the simple advice network, indicating that respondents did not distinguish between these types of knowledge when asking for advice).

Knowledge collecting. The results of the regression analysis of the independent, control variables and knowledge collecting as the dependent variable are shown in table 3. The first model with only the control variables, has an adjusted R2 value of 0.006 ($F=1.176$; $p=0.324$) indicating that the control variables are not satisfactory in explaining the variance of knowledge collecting.. The results of the second model, consisting of the individual level actor variables and control variables, indicate that departmental commitment, relative departmental commitment and enjoyment in helping others significantly explain knowledge collecting. The results of the third

complete model, network level actor variables included, produced the same results as the second model. A comparison of the goodness of fit test for the adjusted R2 of the first and second model indicated that the variance explained of knowledge collecting significantly increased (adj R2 change = 0.291). Thus, the individual level actor variables had a significant effect on knowledge collecting. In addition, the goodness of fit of the third model (adj R2 change = -0.005) is slightly lower compared to the second model. This indicates that the network level actor variables did not explain the variance of knowledge collecting. In sum, according to the complete model, departmental commitment, relative departmental commitment and enjoyment in helping others significantly explain knowledge collecting.

------- INSERT TABLE 3 HERE --------

Knowledge donating. Table 4 shows the results of the regression for knowledge donating. The first model with an adjusted R2 value of 0.119 (F=4.714; p=0.001) indicates that the model with the control variables only already succeeds somewhat in explaining the variance in knowledge donating (contrary to knowledge collecting). The results of the second model, consisting of the individual level actor variables and control variables, indicate that departmental commitment, relative departmental commitment, enjoyment in helping others and IT usage significantly explain knowledge donating. The results of the third model, network level actor variables included, retain the significant effects made by the second model. However, none of the network level actor variables significantly explain knowledge donating. A comparison of the adjusted R2 of the first and second model indicated that the variance explained of knowledge donating significantly increased (adjusted R2 change = 0.236). Thus, the individual level actor variables significantly explain knowledge donating over and above the control variables In addition, the goodness of fit of the third model (R2 change = -0.0087) is again slightly less compared to the

second model. This indicates that the network level actor variables did not explain any of the variance of knowledge donating. In sum, according to the regression analyses, only departmental commitment, relative departmental commitment, enjoyment in helping others and IT usage significantly explains knowledge donating.

------- INSERT TABLE 4 HERE --------

Hypothesis test regarding performance effects: ordinal regression

As the scales using by the organization to measure individual performance, were not equally spaced between categories (while still being ordinal), one of the assumptions of linear regression is violated and ordinal regression is the appropriate form of multivariate analysis for the hypothesis testing between knowledge collecting and knowledge donating as independent variables and individual performance as dependent variable. According to the results of the ordinal regression, which can be found in table 5, the final model is significant (Chi-square=18.172; sig.=0.011). Furthermore, the goodness of fit measures confirms that the model fits (Pearson=93.750; sig.=0.318 and Deviance=107.781; sig.=0.075). The results imply that knowledge collecting is positively associated with individual Performance, but knowledge donating is not, suggesting that the direct effect of knowledge sharing (collecting knowledge for improving one's own job) dominates the indirect effect of knowledge sharing (donating knowledge for improving the organization which was thought to improve one's own job). For a one unit increase in knowledge collecting, the expected ordered log odds increases by 0.828 as you move to the next higher category of individual performance. Thus, knowledge collecting has a positive effect on individual performance. knowledge donating did not have a statistically significant effect on individual performance neither does any of the control variables.

------- INSERT TABLE 5 HERE --------

Summary of results

Results of the analysis in relation to the total combined sample V&DT indicate a significant positive effect of departmental commitment on both knowledge collecting and knowledge donating. Furthermore, relative departmental commitment had a negative effect on knowledge collecting as well as knowledge donating. In addition, enjoyment in helping others positively affects knowledge collecting and knowledge donating. IT usage had a significant positive effect on knowledge donating. The results also indicate a positive relationship between knowledge collecting and individual performance. In short, hypotheses 2a, 2b, 3a, 3b, 5a, 5b, 10b and 15 were supported. All of the other hypothesized relationships between the independent variables and the dependent variables were not supported by the analysis. Figure 2 summarizes the main findings for the total sample V&DT graphically.

------- INSERT FIGURE 2 HERE --------

DISCUSSION AND CONCLUSION

As presented in the theory section, a diverse set of determinants of knowledge sharing has been found to apply to knowledge intensive organizations. Knowledge sharing of individuals within knowledge intensive organizations is affected by individual level actor determinants – motivational factors, perceived organizational factors, and technological factors – and network level actor determinants, and were initially hypothesized to apply similarly to less knowledge intensive organizations. This study implicates that individual knowledge sharing behavior is also

present in less knowledge intensive organizations, however, individual knowledge sharing behavior is affected by only a few of the same variables. According to this study, knowledge sharing of individuals within less knowledge intensive organizations is only affected by motivational factors (departmental commitment, relative departmental commitment and enjoyment in helping others) and technological factors (IT usage). None of the network level actor determinants seem to apply to less knowledge intensive organizations.

Why is this? We can offer a tentative explanation in terms of the motivation and opportunity structure that actors have (Burt, 2010).. The most common reasoning in the literature thus far behind the relationship between network position and knowledge collecting and knowledge donating is that a centrally located actor has more connections with other actors and can therefore access other actors more easily and thus has more opportunities for knowledge sharing. However, this does not mean that a centrally located actor actually uses all of these opportunities and therefore collects and donates more knowledge. Perhaps the necessity of knowledge sharing in a less knowledge intensive organization is not high enough that there is sufficient motivation to use all the opportunities that more centrally located actors have. Although a less centrally located actor may have fewer opportunities, such a peripheral actor can also have high degrees of knowledge collecting and knowledge donating, but just with only a few persons as that is sufficient for a satisfactory job performance.

In a knowledge intensive organization, a knowledge worker's job revolves so much around sharing knowledge, that any opportunity to improve knowledge sharing (coming from an advantageous network position) is seized upon as it improves job performance (Cross & Cummings, 2004). In less knowledge-intensive organization, this link (although somewhat present, as the performance analysis indicates an effect of knowledge collecting –but not

knowledge donating- on job performance) is perhaps much less salient to workers. Hence, workers are less motivated to obtain network positions that help them to improve knowledge sharing as their existing network opportunity structure suffices.

In short, this study makes two main contributions. On one hand this study shows that, knowledge sharing, especially knowledge collecting, is not only an important construct to study in knowledge intensive organizations or organizations with many knowledge workers, but also important for less knowledge intensive organizations and organizations with non-knowledge workers. On the other hand, it shows that the *determinants* of knowledge sharing in less knowledge intensive organizations are quite different from those in knowledge intensive organizations, thus providing an important boundary condition on network-based explanations of knowledge sharing behavior.

Although this study contributes to the existing theory on networks and knowledge sharing, it also has its limitations. First, the empirical study is conducted within a single less knowledge intensive organization and we therefore cannot rule out that certain organization-specific factors such as organizational culture, could explain knowledge sharing as well (although this still would not explain the *absence* of effect for the network variables, unless some complex suppression relationship is assumed). To further generalize the relationships between the different constructs, future research should be focused on replicating this study for other less knowledge intensive organizations or, preferably a combination of knowledge intensive organizations and less knowledge intensive organizations within a single study. Second, additional factors such as extrinsic motivation or trust in co-workers or demographic faultlines may further explain knowledge sharing (although as stated previously, this again would not explain the absence of network-related effects). Thirdly, we used betweenness centrality as our main network-related

measure. Although this is in line with previous research in this area, this is a measure calculated at the overall network level for each actor. It is possible that this may not be the most relevant level of analysis for centrality as it implicitly assumes that knowledge flows stretch across the entire organization. Maybe knowledge flows are more localized and hence centrality is better assessed within some smaller subnetwork with a smaller network horizon (Van Liere et al., 2008). Whatever the explanation may be though, it makes less knowledge intensive organizations a very interesting area to study networks and knowledge sharing.

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APPENDIX: SURVEY QUESTIONS FOR SELECTED CONSTRUCTS

Departmental Commitment

DepCom1: This department is a good organization for me to work for.

DepCom2: I'm really concerned about how this department is doing.

DepCom3: I put in extra effort in order to make this department succeed.

DepCom4: I talk to my friends and acquaintances about this department as a nice department to work for.

Enjoyment in Helping Others

EnjHelp1: I enjoy sharing my knowledge with colleagues.

EnjHelp2: I enjoy helping colleagues by sharing my knowledge.

EnjHelp3: It feels good to help someone by sharing my knowledge.

EnjHelp4: Sharing my knowledge with colleagues is pleasurable.

IT Usage

ITUse1: To what extent do you use email

ITUse2: To what extent do you use the intranet.

Knowledge Sharing Collecting

KnShCo1: When I need certain knowledge, I ask my colleagues about it.

KnShCo2: I like to be informed of what my colleagues know.

KnShCo3: I ask my colleagues about their abilities when I need to learn something.

KnShCo4: When a colleague is good at something, I ask them to teach me how to do it.

Knowledge Sharing Donating

KnShDo1: When I've learned something new, I tell my colleagues about it.

KnShDo2: I share information I have with my colleagues.

KnShDo3: I think it is important that my colleagues know what I am doing.

KnShDo4: I regularly tell my colleagues what I am doing.

APPENDIX 2: TABLES AND FIGURES

Figure 1: research model

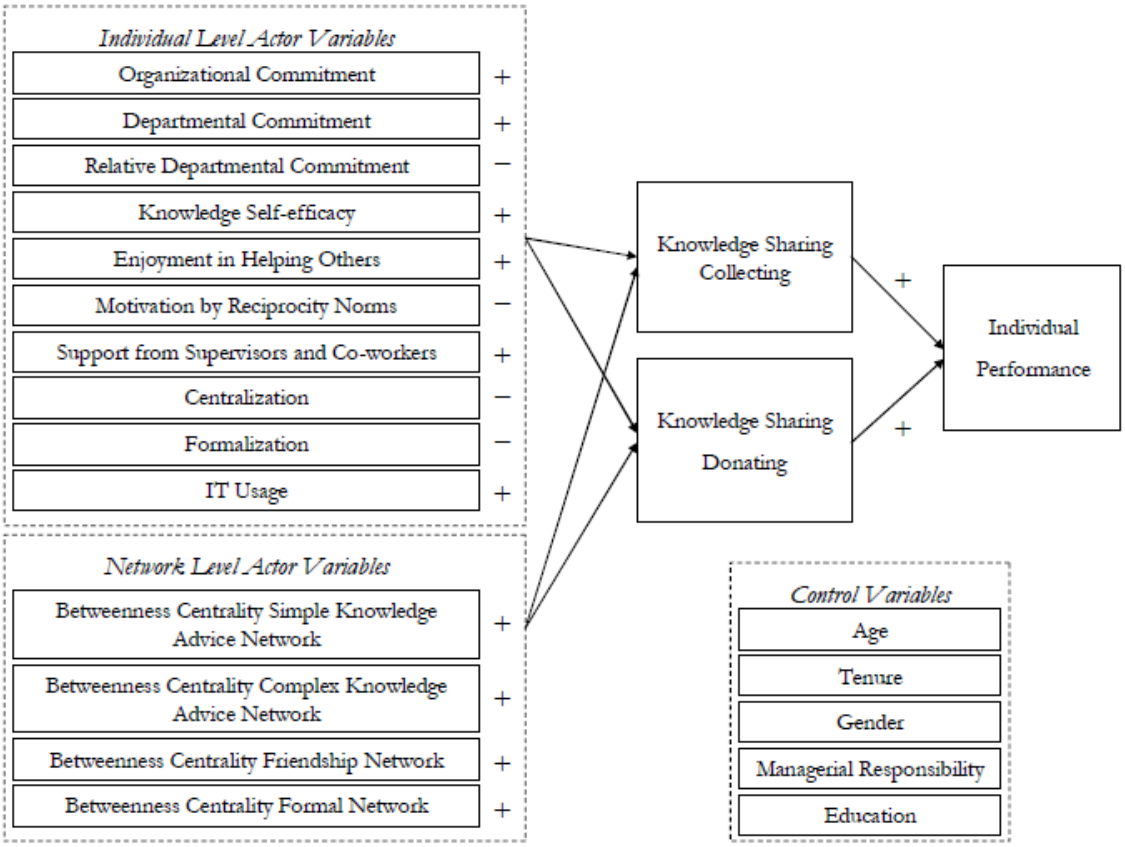

Figure 2: Graphical summary of main findings

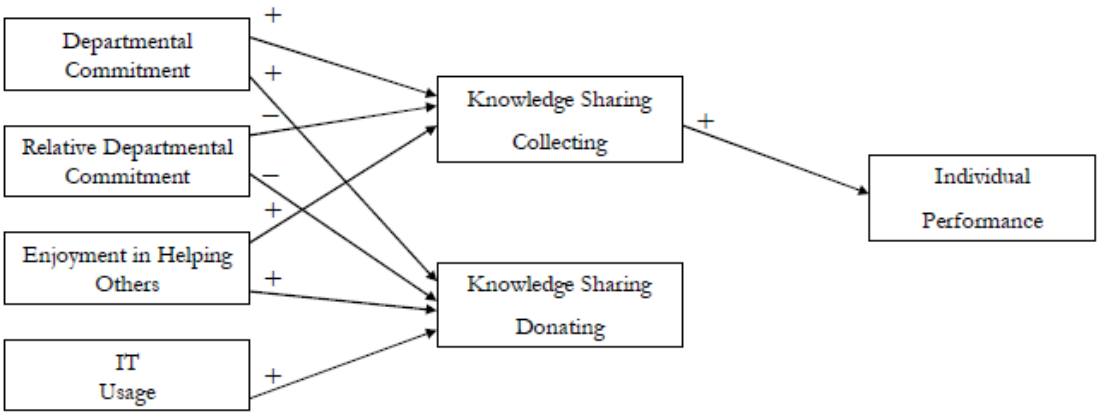

Table 1: Descriptives

Variable	N	Mean	Std. Deviation
Individual level actor variables – independent variables			
Organizational Commitment	142	4.99	1.23
Departmental Commitment	142	5.67	1.21
Relative Departmental Commitment	142	1.18	0.31
Knowledge Self-efficacy	142	5.01	1.18
Enjoyment in Helping Others	142	5.66	0.93
Motivation by Reciprocity Norms	142	4.35	1.14
Support from Supervisors and Co-workers	142	4.97	1.20
Centralization	142	3.30	1.35
Formalization	142	4.35	1.05
IT Usage	142	2.10	1.78
Network level actor variables – independent variables			
Betweenness Centrality Simple Knowledge Advice Network	142	1.83	4.28
Betweenness Centrality Complex Knowledge Advice Network	142	1.74	5.45
Betweenness Centrality Friendship Network	142	1.91	3.66
Betweenness Centrality Formal Network	142	1.79	4.03
Dependent variables			
Knowledge Sharing Collecting	142	5.68	1.04
Knowledge Sharing Donating	142	5.27	0.97
Individual Performance	103	3.60	0.57

Table 2: Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 KnShCo	1																
2 KnShDo	.722**	1															
3 IndPerf	.306**	.299**	1														
4 OrgCom	.394**	.426**	.552**	1													
5 DepCom	.331**	.403**	.499**	.632**	1												
6 RelDepCom	-.195*	-.148	-.248*	-.551**	.225**	1											
7 KnSelf	.210*	.305**	.256**	.276**	.369**	.064	1										
8 EnjHelp	.474**	.545**	.400**	.538**	.479**	-.124	.475**	1									
9 MotiReci	.281**	.274**	.085	.379**	.286**	-.152	-.036	.379**	1								
10 SupSupCo	.324**	.437**	.159	.567**	.428**	-.234**	.275**	.469**	.328**	1							
11 Centr	.002	.038	-.154	.010	.021	.020	-.161	-.167*	.148	.096	1						
12 Form	.201*	.187*	-.091	.115	.153	.015	.047	.060	.137	.234**	.361**	1					
13 ITUse	.131	.245**	.215*	.107	.232**	.063	.261**	.149	-.027	.128	-.153	.147	1				
14 BeCeSiKnAd	.140	.217**	.232*	.138	.180*	.002	.255**	.222**	-.048	.093	-.147	.186*	.517**	1			
15 BeCeCoKnAd	.130	.215*	.198*	.175*	.188*	-.027	.254**	.240**	-.064	.135	-.172*	.187*	.537**	.945**	1		
16 BeCeFriend	.164	.167*	.079	.020	.082	.032	.181*	.149	-.007	.040	-.071	.072	.134	.353**	.303**	1	
17 BeCeFormal	.118	.144	.205*	.117	.124	-.031	.216**	.165*	-.122	.045	-.148	.012	.395**	.440**	.412**	.139	1

Table 3: Results OLS regression knowledge collecting

	Standardized Coefficient Model 1	Standardized Coefficient Model 2	Standardized Coefficient Model 3
Control variables			
Age	0.157	0.038	0.036
Tenure	-0.046	-0.127	-0.108
Gender	0.122	0.107	0.088
Managerial Responsibility	0.018	-0.150	-0.167
Education	0.144	0.149	0.153
Individual level actor variables – independent variables			
Departmental Commitment	-	0.251***	0.251***
Relative Departmental Commitment	-	-0.314****	-0.311****
Knowledge Self-efficacy	-	0.009	-0.008
Enjoyment in Helping Others	-	0.331****	0.316***
Motivation by Reciprocity Norms	-	0.069	0.078
Support from Supervisors and Co-workers	-	-0.068	-0.064
Centralization	-	0.025	0.030
Formalization	-	0.079	0.070
IT Usage	-	0.169	0.153
Network level actor variables – independent variables			
Betweenness Centrality Simple Knowledge Advice Network	-	-	0.000
Betweenness Centrality Friendship Network	-	-	0.099
Betweenness Centrality Formal Network	-	-	0.039
R^2	0.042	0.369	0.379
Adjusted R^2	0.006	0.297	0.292
F	1.176	5.174****	4.341****

*p < 0.10; **p < 0.05; ***p < 0.01; ****p < 0.001

Table 4: Results OLS regression knowledge donating

	Standardized Coefficient Model 1	Standardized Coefficient Model 2	Standardized Coefficient Model 3
Control variables			
Age	0.319	0.157	0.158
Tenure	0.009	-0.049	-0.040
Gender	0.137	0.134	0.129
Managerial Responsibility	0.083	-0.109	-0.134
Education	0.031	0.032	0.033
Individual level actor variables – independent variables			
Departmental Commitment	-	0.155*	0.156*
Relative Departmental Commitment	-	-0.196**	-0.197**
Knowledge Self-efficacy	-	0.033	0.022
Enjoyment in Helping Others	-	0.346****	0.335****
Motivation by Reciprocity Norms	-	0.022	0.024
Support from Supervisors and Co-workers	-	0.047	0.050
Centralization	-	0.074	0.079
Formalization	-	0.019	0.005
IT Usage	-	0.224*	0.219*
Network level actor variables – independent variables			
Betweenness Centrality Simple Knowledge Advice Network	-	-	0.051
Betweenness Centrality Friendship Network	-	-	0.067
Betweenness Centrality Formal Network	-	-	-0.021
R^2	0.151	0.420	0.427
Adjusted R^2	0.119	0.355	0.347
F	4.714****	6.422****	5.313****

*p < 0.10; **p < 0.05; ***p < 0.01; ****p < 0.001

Table 5: Results ordinal regression individual performance

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Individual Performance = 3]	3.723	2.061	3.262	1	.071	-.317	7.763
Location	Knowledge Sharing Collecting	.828	.407	4.129	1	.042	.029	1.626
	Knowledge Sharing Donating	-.359	.434	.684	1	.408	-1.209	.492
	Age	.052	.034	2.347	1	.126	-.015	.119
	Tenure	-.005	.049	.011	1	.916	-.101	.090
	Gender	.362	.587	.382	1	.537	-.787	1.512
	Managerial Responsibility	.632	.670	.890	1	.345	-.681	1.946
	Education	-.604	.521	1.346	1	.246	-1.624	.416

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