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ABSTRACT

Knowledge sharing is crucial to organizational and team success. As the complexity and contextualization of knowledge management systems continue to escalate, employees are increasingly relying on peers for contextualized technical help. Our study focuses on knowledge sharing from the perspective of employees who provide technical help, and whether employees who are central to team communication networks are more likely to share knowledge. Using a goodness-as-fit perspective, we examined knowledge sharing through the information processing capabilities of individual centrality and information processing needs of helping behavior. Our results demonstrated that helping behavior, when coupled with individual centrality, predicted knowledge sharing. We subsequently discuss other outcomes of our analyses and findings, along with the implications and contributions of our study.

Keywords

Individual centrality, helping behavior, knowledge sharing, fit.

INTRODUCTION

Considering the importance of knowledge sharing to team success and to organizations' competitive advantage (Schultze and Leidner, 2002), organizations have sought to encourage knowledge sharing through knowledge management systems (KMS). With increasingly complex KMS, employees often turn to peers for contextualized support (Sykes et al., 2009). However, except for a few studies involving general system use (Govindarajulu, 2002, Sykes et al., 2009), the study of helping behavior in the context of knowledge sharing remains absent. Providing helping requires time and effort, and requires employees to possess the proper working knowledge to render the appropriate help.

Employee characteristics in the form of individual centrality are likely to impact helping behavior, and in turn influence knowledge sharing. Employees central to communication networks possess strategic access to resources and knowledge, bridging disconnected parties (Burt, 1992). Consequently, these employees are associated with influence and performance (Brass, 1984, Bunderson, 2003, Mehra et al., 2001). Thus, employees are likely to have differing information processing capabilities depending on their individual centrality.

Our study draws on the organizational concept of fit, which proposes that the fit between the nature of a specific task and organizational structure or technology is associated with performance (Ahuja and Carley, 1999, Goodhue and Thompson, 1995, Zigurs and Buckland, 1998). That is, the extent to which employees engage in helping behavior depends on their capacity to support such information processing needs, and in turn, knowledge sharing. Formally stated, we ask: *does the fit between individual centrality and helping behavior impact employees' knowledge sharing?*

THEORETICAL BACKGROUND

Individual Centrality

The social ties of employees influence work processes and outcomes (Krackhardt, 1990), such as knowledge sharing (Wasko et al., 2009), and often possess salience over prescribed role and status (Ahuja et al., 2003, Krackhardt and Hanson, 1993, Teigland and Wasko, 2009). Our study considers individual centrality, or the extent to which an employee is linked to others. Individual centrality is a strong indicator of employee performance (Ahuja et al., 2003), personality, and predisposition (Klein et al., 2004, Mehra et al., 2001, Sasovova, 2006).

Employees with high individual centrality are highly connected and interdependent. Drawing from Brass (1981), work for employees central to organizational communication networks is often standardized, with low autonomy and significance, leading to dissatisfied employees. However, employees central to team communication networks experience are likelier to reside at the boundaries, allowing access to a variety of resources (Burt, 1992). These employees possess greater autonomy, feedback (Brass, 1981), and consequently greater performance (Brass, 1984, Bunderson, 2003, Mehra et al., 2001).

Helping

Although helping behavior has been studied in information technology contexts (Govindarajulu, 2002, Sykes et al., 2009), there has been little theoretical discussion of this concept. Drawing from the organizational citizenship literature, we define helping behavior in this study as a form of contextualized behavior that supports the overall work environment (Borman and Motowidlo, 1997). Helping behavior may not necessarily be seen as distinctly in-role or extra-role, but rather how an employee views the act of helping others in his or her work (Morrison, 1994).

Employees are likelier to engage in help others in the use of information technology when they consider KMS as integral to their work, while employees who possess greater knowledge or influence might view helping others as part of their overall job responsibility (Beaudry and Pinsonneault, 2005, Kim and Kankanhalli, 2009, Lewis et al., 2003, Taylor and Todd, 1995). Considering that specific knowledge and resources are required in the use of complex technological systems (Fichman and Kemerer, 1999), peers who possess the requisite knowledge play a vital in helping peers and facilitating system use. However, there is still little known about helping in such contexts, particularly from the helpers' perspective.

Organizational Concept of Fit

Scholars proposed that through an appropriate fit between information processing needs and information processing capabilities, organizations are able to reap performance benefits. Information processing needs often refer to the tasks that employees execute. Information processing capabilities refer to the extent in which an entity is able to meet the information processing needs of the tasks. With certain combinations of tasks and organizational structures, this will lead to better work performance (Aiken and Hage, 1971). For example, situations with non-routine and uncertain tasks often require greater information processing capabilities through proper communication and efficient information flows within teams (Keller, 1994) and a centralized network structure is better suited to routine tasks at predicting performance, whereas a decentralized structure is suited to non-routine tasks (Ahuja and Carley, 1999).

MODEL DEVELOPMENT

Drawing from social network theory, individual centrality relates to employees' processing information capabilities. Highly central employees benefit from access to knowledge and resources, possess a greater variety of skills (Brass, 1981). Highly central individuals are also better equipped to contribute knowledge due to their cognitive awareness of knowledge requirements, reduced costs and greater access to knowledge, and increased ability in translating and codifying knowledge (Olivera et al., 2008).

The expertise and resources of highly central employees mean that the perceived costs in contributing knowledge are reduced (Kankanhalli et al., 2005). Such employees have greater influence, status, and awareness of organizational mandates, and are likelier to adopt such initiatives. Furthermore, employees central to the communication network contributing knowledge will be able to facilitate and ease their work by directing knowledge requests towards a knowledge repository. As such, these employees are more likely to contribute knowledge compared to other individuals.

Hypothesis 1. Individual centrality will positively relate to knowledge sharing.

Helping behavior, defined as the support of a team member in the use of a KMS, may be seen as the ability to fulfill a set of information processing needs. Considering the complexities inherent to such systems, rendering helping is a demanding task

that requires knowledge and expertise regarding the KMS. Furthermore, not all employees are willing to spend the necessary time and effort required to provide helping. Thus, in addition to possessing the required knowledge and expertise, employees have to weigh the costs and benefits in providing helping.

Employees who exhibit a high level of helping behavior are likely to be more committed and invested in the use of the KMS and consider the act of helping behavior as an in-role or obligatory task (Borman and Motowidlo, 1997). In such a context, the use of KMS may be an integral part of their work, or who are in a position to benefit from such systems. Employees who render helping behavior are also likely indicators of expertise and commitment in the use the KMS. Thus, we suggest that helping behavior is a likely indicator of knowledge sharing.

Hypothesis 2. Helping behavior will positively relate to knowledge sharing.

For employees providing high levels of helping, they are likely to possess the requisite knowledge, resources, and influence. With high individual centrality, these employees are likely to possess the appropriate information processing capabilities to provide helping. In addition to possessing greater ability, highly central employees are also able to leverage upon their reach to acquire necessary support knowledge. With lower helping behavior, this indicates that the highly central employees may not be invested in the KMS, leading to lower knowledge sharing.

By contrast, employees with low centrality are generally less likely to possess the knowledge and resources necessary to help peers in the use of complex systems. Relative to highly central individuals who possess a more general knowledge of their organizations, these individuals possess narrow, specialized knowledge to fit their specific routines and work, and are less likely to be able to provide extensive helping behavior. Rather, such isolated employees are likely to contribute the appropriate knowledge and resources that specifically pertain to their tasks and work. Hence, we hypothesize the following:

Hypothesis 3. High (low) individual centrality coupled with high (low) helping behavior will positively relate to knowledge sharing.

We summarize our overall research model below.

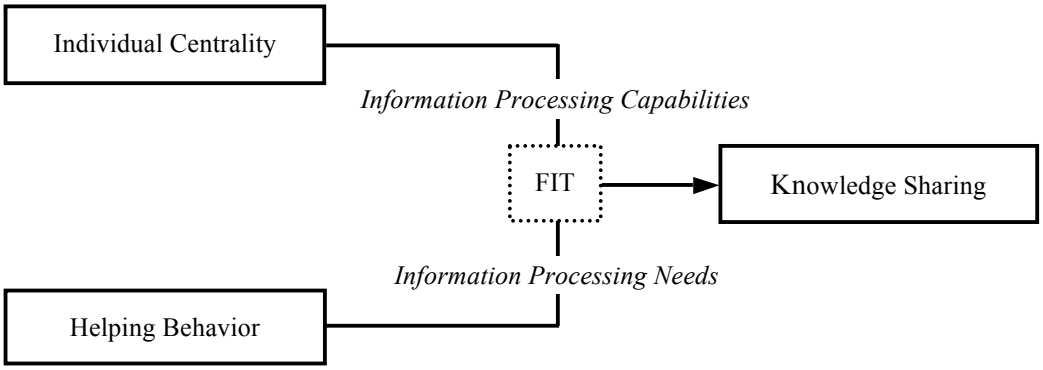

Figure 1. Model of Individual Centrality, Helping, and Knowledge Sharing

METHODOLOGY

Measurement

Two variables measured knowledge sharing frequency and helping behavior, using KMS as a referent, while one variable captured individual centrality. We used established measurement scales from past studies and provided a definition and examples of KMS in our survey to ensure all respondents had a similar conceptualization of KMS. Unless otherwise stated, all responses adopted a seven-point Likert-type scale ranging from "Strongly Disagree" to "Strongly Agree". A total of 141 responses were gathered from working professionals enrolled in part-time courses at a large university. The average team size was 10 members with an average tenure of 2 years. Monetary rewards were given to all participants.

Individual Centrality. As this study is concerned with individual centrality within teams, we captured the team network of each respondent. In collecting team network data for individual centrality, each employee reports on the extent to which he or she provides the input and output of work documents and materials necessary to the completion of tasks (Brass, 1984). As we were concerned with the immediate ties of the respondents and actual work processes and not subjective perceptions (e.g., friendship), the problem of perceptual biases (Mehra et al., 2001) was minimized.

Helping Behavior. We adapted helping behavior measures towards the context of KMS use from a larger construct measuring organizational citizenship behavior captured from the employees' perspective (Morrison, 1994). Morrison observed that the employees' perspective was vital to understanding helping behavior as employees and employers differ in their extent to which organizational citizenship behavior was viewed as in-role or extra-role.

Fit. We measured fit using a fit-as-matching approach (Ahuja and Carley, 1999, Alexander and Randolph, 1985, David et al., 1989, Venkatraman, 1989). We calculated fit as the absolute difference for each paired-value of individual centrality and helping behavior (i.e., Fit = $| C_i - S_i |$, where C_i = individual centrality and S_i = helping behavior), and reverse-coded the results, such that 7 represented the best fit while 1 represented the worst fit.

Knowledge Sharing. We captured knowledge sharing using a set of established measures tested and adopted by major studies by Igbaria et al. (1996), Davis (1989) and Kankanhalli et al. (2005) where respondents indicated their frequency of knowledge sharing onto KMS.

Control Variables. We controlled for team size, as the impact of individual centrality may differ (Brass, 1981). We also controlled for geographic dispersion, which influences individual centrality (Ahuja et al., 2003) and communication patterns (Gibson and Gibbs, 2006). Finally, we included industry, tenure, and organizational mandate. Long tenured employees may view helping and knowledge sharing as generalized reciprocity (Morrison, 1994, Wasko and Faraj, 2000), while organizational mandate (Lewis et al. 2003) may influence knowledge sharing (Kankanhalli et al., 2005).

DATA ANALYSIS

We assessed the internal reliability of multi-item variables, with the alpha coefficients for organizational mandate (0.90), helping behavior (0.85), and knowledge sharing (0.85) reporting higher than the 0.70 threshold recommended (Nunnally, 1979). Confirmatory factor analysis yielded no significant intercorrelations. The means, standard deviations, and correlations for each variable are reported in Table 1. As our survey responses were cross-sectional and self-reported, we used Harmon's single factor test to determine that our survey responses were free from common method bias (Podsakoff et al., 2003).

	Mean	*sd*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1. Team size	9.56	8.55	-						
2. Geographic dispersion	1.74	1.21	0.15	-					
3. Industry	4.03	3.27	-0.04	0.02	-				
4. Tenure	1.71	1.24	-0.02	0.08	-0.01	-			
5. Organizational mandate	4.88	1.03	0.18*	0.19*	-0.02	0.08	-		
6. Individual centrality	3.08	1.87	-0.30**	0.11	0.01	-0.01	-0.10	-	
7. Helping behavior	4.80	0.96	-0.14	0.22*	0.09	-0.02	0.32**	0.24**	-
8. Knowledge sharing	4.48	1.21	0.20*	0.19*	0.05	-0.07	0.38**	0.03	0.39**

*. Correlation is significant at the 0.05 level (2-tailed)

**. Correlation is significant at the 0.01 level (2-tailed).

Table 1. Means, Standard Deviations, and Correlations

Hypotheses Testing

We tested our hypotheses using regression analysis (Ahuja and Carley, 1999, Alexander and Randolph, 1985), which yielded an R^2 of 0.27 (F-statistic = 7.16, $p < 0.001$, $n = 132$). Consistent with past studies (Lewis et al., 2003, Taylor and Todd, 1995), organizational mandate was positively related to sharing frequency and helping behavior. However, individual centrality was not, running contrary to existing studies which reported outcomes such as performance (Mehra et al., 2001) and system use (Sykes et al., 2009).

The relationship between individual centrality and knowledge sharing was not significant ($b = -0.21$, $t = -1.68$, *NS*). Thus, Hypothesis 1 was unsupported. Helping behavior was positively related to knowledge sharing, supporting Hypothesis 2 ($b = 0.47$, $t = 4.49$, $p < 0.01$). Finally, the relationship between individual centrality and helping behavior and sharing frequency was both positive and significant ($b = 0.31$, $t = 2.35$, $p < 0.05$), supporting Hypothesis 3. A summary of the analysis is listed in Table 2 (Model 1).

Considering that a fit-as-interaction effect may be present (Venkatraman, 1989), we conducted a moderation analysis (Table 2; Model 2). This analysis yielded an R^2 of 0.30 (F-statistic = 7.00, $p < 0.001$, $n = 135$) with a positive interaction effect between individual centrality and helping behavior ($b = 0.30$, $t = 3.51$, $p < 0.01$), plotted in Figure 2. This suggested that helping behavior is a strong indicator of knowledge sharing for high individual centrality.

DV: Knowledge sharing	*Model 1*		*Model 2a*		*Model 2b*		*Model 2c*	
	Beta	t	Beta	t	Beta	t	Beta	t
Team size	0.19	2.33*	0.05	0.65	0.12	1.50	0.13	1.59
Geographic dispersion	0.02	0.30	0.10	1.27	0.05	0.57	0.03	0.31
Industry	0.02	0.23	0.06	0.79	0.04	0.47	0.08	1.02
Tenure	-0.01	-0.85	-0.10	-1.23	-0.08	-1.01	-0.07	-0.90
Organizational mandate	0.25	3.07*	0.37	4.50**	0.28	3.30**	0.26	3.20**
Individual centrality (C_i)	-0.22	-1.74			0.01	0.01	-0.80	-0.92
Helping behavior (S_i)	0.48	4.70**			0.30	3.50**	0.27	3.23**
Fit (7 - $\mid C_i - S_i \mid$)	0.30	2.39*						
Individual centrality × helping behavior							0.26	3.20**
R^2		0.27**		0.17**		0.25**		0.30**

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table 2. Regression Analyses

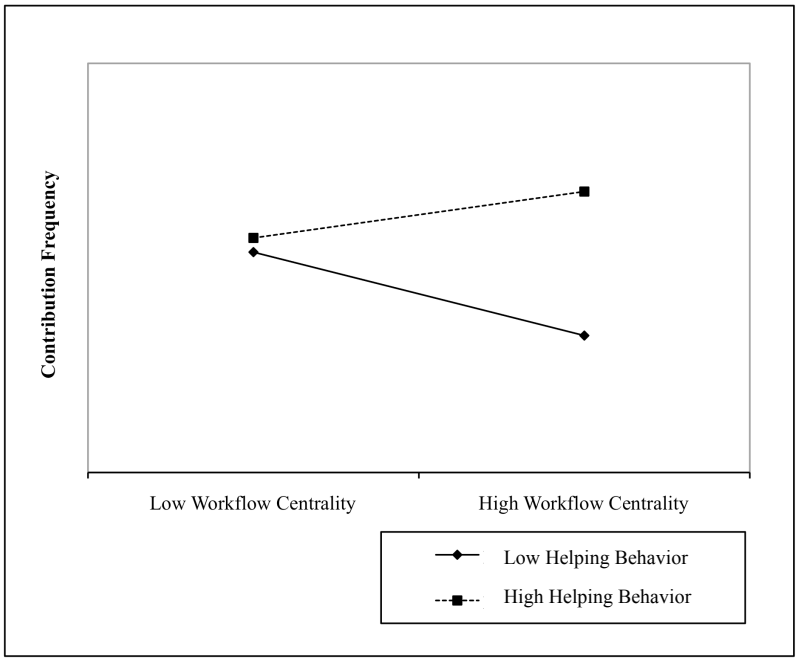

Figure 2. Simple Plot of Regression Analyses (Fit-as-Moderation)

DISCUSSION

Our study hypothesized for the relationships between individual centrality, helping behavior, and knowledge sharing. Specifically, we focused on the notion of fit between individual centrality and helping behavior in predicting knowledge sharing. Despite the amount of work pointing towards the positive work outcomes of individual centrality, we were unable to find any direct relationship between individual centrality and knowledge sharing.

The lack of a direct relationship between individual centrality and knowledge sharing may be attributed to the work nature of employees. Although highly central individuals possess greater awareness of knowledge sources and initiate knowledge sharing (Bunderson, 2003), they may be of higher rank and status (Lincoln and Miller, 1979), e.g., managers who are more likely to be coordinating work efforts instead of actively contributing knowledge. Rather, knowledge is more likely to be shared by employees in the relevant domain of work.

Based on employees' predisposition and their ability to share knowledge, we found that helping behavior was a strong predictor of knowledge sharing. Our findings further suggest that highly central employees are in a better position to render help while contributing knowledge ($b = 0.30$, $t = 2.39$, $p < 0.05$). This may stem from the obligation to render help as such employees are likely to be sought after due to their perceived status and knowledge. They are also likely to be invested in a system, and providing helping further facilitates their domain of work.

Using helping behavior as a moderator, we found that the extent to which highly central employees contribute knowledge increased as they rendered helping behavior ($b = 0.26$, $t = 3.20$, $p < 0.01$). Similarly, central employees do not engage in helping behavior reported lower knowledge sharing, less so than employees who are not central. For the latter, helping behavior did not vary in predicting knowledge sharing, suggesting that employees in the periphery do not possess the resources to sufficiently render helping behavior and may not be obligated to do so.

Our intercorrelation analysis yielded some interesting findings. Knowledge sharing was correlated with team size ($b = 0.20$, $p < 0.05$) and geographic dispersion ($b = 0.19$, $p < 0.05$), suggesting that larger teams over geographic boundaries might incline team members to contribute knowledge. Organizational mandate was strongly correlated knowledge sharing ($b = 0.38$, $p < 0.01$), and helping behavior ($b = 0.32$, $p < 0.01$), stressing the importance of management support.

Limitations

This study depended on the use of self-reported measures (e.g., knowledge sharing). As such, our study would benefit from the use of subjective and objective measures, considering that purely objective measures are unable to capture the quality and nature of sharing (Ahuja and Carley 2003). We also sought to overcome some of these problems by adopting measures from well-established studies and exercised caution in the adoption, design, and operationalization of these measures and conducted additional analyses to ensure that our study did not suffer from common method bias.

While a network-centric approach to capturing individual centrality is often preferred, we captured individual centrality from an egocentric approach, a method also established in prior studies (Burt, 1997). Consequently, we were able to draw from a large sample as opposed to small organizational networks. Furthermore, we tapped upon contacts respondents frequently interacted with, reducing the problem of perceptual or recollection bias (Krackhardt, 1996). Our reference to objective work processes as opposed to perceptions of friendship and advice relationships further aided the reliability of the measures.

Implications for Research

Our study contributed to the existing technological and organizational fit literatures by examining the conceptualization of fit applied to individual centrality and helping behavior. Individual centrality alone failed to predict knowledge sharing. However, coupling information processing capabilities with information processing needs allowed us to gain a richer picture of individual centrality. While helping behavior would require greater information processing needs, this did not appear have a negative impact. Rather, our findings showed that highly central team members contributed knowledge based on their information processing needs in terms of helping behavior.

While we did not explicitly hypothesize or examine for the impact of task complexity on the extent of rendering helping behavior, this is a fruitful area of research that will enable us to better understand the impact of such behavior on performance. We also noted earlier that the size of communication networks might also impact helping behavior, and in turn knowledge sharing. Future research may look into the examining the impact of centrality within large social networks, its fit with helping behavior, and impact upon different types of knowledge sharing.

Implications for Management

Managers may be well served in considering helping behavior as beneficial to specific outcomes such as knowledge sharing and in turn overall work productivity and performance. Our results have demonstrated that for highly central employees, engaging in helping behavior was a strong predictor of knowledge sharing. However, what is potentially crucial for managers to consider is the impact of highly central employees within the communication network who do not engage in helping behavior.

Considering the relative influence and power that highly central individuals possess, a lack of support or investment into KMS or technological initiatives by highly central employees may have potentially damaging effects on the extent to which the peers of these individuals use technological systems and subsequently, the overall success of such work initiatives. As such, managers may need to consider both the communication patterns of employees coupled with the extent of helping behavior rendered, and to perform the appropriate intervention measures.

CONCLUSION

Scholars had begun to observe the importance of helping behavior, particularly with complex technological systems (Govindarajulu, 2002). We drew from existing fit theories to understand the information processing needs and information processing capabilities inherent to the particular positions of employees within team communication networks, and the degree of helping rendered. Considering that we were not able to find any direct relationship between individual centrality and knowledge sharing prior to the fit analysis involving helping behavior, this study allowed us to consider helping behavior as a strong indicator of knowledge sharing, and its potential impact on employee behavior and performance on organizations.

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