A cognitive model of intra-organizational knowledge-sharing motivations in the view of cross-culture

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1. Introduction

Cooperation or collaboration is surely known as a central and effective working means to achieve desired outcomes for an organization (Siemsen, Balasubramanian, & Roth, 2007). Today’s knowledge-based economy knowledge, especially that possessed by individuals, plays a critical role in driving the organization value (Jasimuddin, 2007; Nonaka & Konno, 1998). Consequently, knowledge-sharing (KS) behavior among employees, which enables the element of cooperation, can be of paramount importance in shaping the organization’s fortunes (Wang, 2004; Woods, 2001). By virtue of KS behavior, the most valuable personal knowledge can be transferred to multiple individuals, expanded throughout an organization, and finally help the organization to achieve success (Lin, 2008; Osterloh & Frey, 2000; Wang, 2004).

The significance of KS is well-recognized but there is a relative lack of significant KS within real-life firms. Many efforts have been made to find approaches and mechanisms to enhance KS (Bock, Lee, & Zhmud, 2005; Chow, Deng, & Ho, 2000; Willem & Buelens, 2009). Some efforts attempted use of technological methods (Alavi & Leidner, 2001; Sher & Lee, 2004); others have sought to stimulate individual KS intentions and responses to incentive systems (Bock et al., 2005; Hsu, 2006; Hwang & Kim, 2007). Despite the development of information technology applications which have facilitated knowledge sharing to a great extent, people’s behavioral inclinations for hiding knowledge and not responding to incentive systems further come to the surface and become the central and essential impediment to an acceptable level of KS (Chow et al., 2000; Grover & Davenport, 2001; Hsu, 2006).

Generally speaking, all external influences tend to operate through an individual’s internal cognition (Malhotra & Galletta, 2005). Specifically, external influences are first projected to one’s interior interface (such as social norms) and in turn undergo the influence of internal cognitive mechanisms before being displayed as external behavior. Thus the insights into an individual’s cognitive mechanism toward KS motivation can reveal the principle of individual perceptions toward KS activities and subsequently provide more effective measures to judge individual inclinations toward KS. This paper proposed such an individual cognitive model. The model depicts individual motivation acting upon differential cognitive processes based on an individual’s commitment toward sharing knowledge. These processes seek to project how an individual’s intrinsic motivation derived from social norms and personal norms, and extrinsic motivation derived from reward...
and punishment make concerted efforts to shape the ultimate intention to share knowledge.

As revealed by many previous studies, individuals from various nations usually hold diverse cognitive mechanisms influenced by national cultural norms, which as the antecedent of individual beliefs and values predispose employees to certain behavioral attitudes and intentions (Ford, Connelly, & Meister, 2003; Hofstede, 1980; Srite & Karahanna, 2006). Though employee motivation toward KS has been the subject of much academic research, this sort of research has mainly consisted of single-country studies (Bock et al., 2005; Hsu, 2006; Taylor, 2006; Willem & Buclens, 2009). The economic globalization trend urges continual interaction among different nations, which in turn intensifies the multicultural conflicts in knowledge sharing and management (Hofstede & Bond, 1988; Zakaria, Amelinckx, & Wilemon, 2004). Hofstede (1994) postulated that cultural values shape theories and practices of organizational management. Furthermore, Hofstede (1993) pointed out that the present view of management was established in the western-oriented frame of reference, especially the Anglo-American/North American orientation. Although that view generally continues to prevail today, those concepts of management are no longer viewed as universally applicable. Under this perspective the “best” western-style knowledge-sharing practices and management control tools can be ineffective or even dysfunctional in non-western environments (Chow, Kato, & Merchant, 1996). Consequently, organizational practices to enhance employees’ knowledge sharing under non-western cultural contexts should be explored.

This study seeks to transcend single-culture KS motivation research and take the influence of cross-cultural background into account. It specifically contributes to the following two aspects:

(1) It offers a cognitive model to present how individual motivation operates through differential cognitive processes to output the final intention to KS. The model can integrate the functional mechanisms of both intrinsic and extrinsic motivation “through the eyes of action subjects”. Thus it can deepen our understanding of KS motivation mechanisms and intention formation. (2) It integrates Hofstede’s (2001) multidimensional national cultural framework to theorize cross-cultural differences in the KS cognitive mechanisms and shed light on the direct and moderating effects of national culture. Consequently, it can provide researchers and practitioners with the in-depth understanding of how people from different national cultures perceive KS motivation and shape their final attitudes and intentions to KS in different ways.

Given the salient gap between Anglo-American and Chinese-based cultures and the influence of their intercultural and intra-cultural economies in the global environment (Chow et al., 2000; Hofstede & Bond, 1988; Huang, Davison, Liu, & Gu, 2008), our study conducted an empirical investigation on equivalent sample populations from both the USA and China, which were respectively projected as cross-sections of Anglo-American and Chinese-based cultures.

The survey found strong support for both the cognitive model and the proposed hypotheses associated with cross-cultural differences on this model. The findings from this study should have far reaching theoretical and pragmatic implications for global perspectives. Especially we expect that they will be of particular value for the design and implementation of subtle management systems to boost KS in consonance with diverse cultural backgrounds (Tsui, 2001).

The remainder of this paper is organized as follows. In the next section, the theoretical bases of the study are described, correspondingly the research model and the research hypotheses are proposed. The third section describes our research methods. The fourth section discusses our research findings, and their implications for research and practice. The last section concludes with the study’s limitations and proposes the future research possibilities.

2. Theoretical framework and hypotheses

2.1. A cognitive model of knowledge sharing

Notwithstanding the concept of knowledge management in developed economies is not as well received today as it was in its initial stages, a series of organizational practices related to knowledge management such as capturing, storing, sharing, and using knowledge is still indispensable to organization operations (Stankosky, 2005). Knowledge sharing is just considered to be the most critical component among these knowledge-based activities (Coakes, Coakes, & Rosenberg, 2008; Kuo & Young, 2008). It is defined as individual behaviors which facilitate the dissemination or transfer of the knowledge that one has created or acquired throughout an organization (Hsu, 2006). Here, the shared knowledge contains both explicit knowledge regarding know-what and know-why, and implicit knowledge regarding know-how and know-who.

As Bock argued, “organizational knowledge largely resides within individuals” (Bock et al., 2005, p. 89); even with the codification of knowledge, knowledge objects would remain in shadow unless the knowledge owners expose them by themselves. As a result, to promote KS the employee’s motivation namely, employee’s inherent tendency and willingness to share their knowledge, is essential to success (Bock et al., 2005; Hsu, 2006; Lin, 2007). Thus the current study would focus on the perspective of employee motivation. Our target goal is to seek predictive indicators on the intention to KS. The intention refers to the degree to which people are willing to make efforts to engage in KS (Ajzen, 1991).

Many studies have been devoted to analyzing KS motivations and impediments (Bock et al., 2005; Chua, 2003; Hwang & Kim, 2007; Quigley, Tesluk, Locke, & Bartol, 2007). They provide a variety of classifications of motivations from different angles and lay the foundation for the current study. Given the volitional nature of self-determined KS behaviors (Lin, 2007), an individual’s commitment to knowledge sharing will determine the success or failure of KS activities (Hwang & Kim, 2007; Malhotra & Galletta, 2005). In this paper, we propose a cognitive model to reveal both intrinsic and extrinsic motivation mechanisms by emphasizing an individual’s commitment to KS. Fig. 1 depicts our basic model.

Generally, commitment is defined as the individuals’ psychological attachment to knowledge sharing. The social influence theory (Kelman, 1958, 1961) distinguishes the types and levels of commitment into the three processes (internalization, identification, and compliance), which will influence behavioral attitudes and intentions (Hwang & Kim, 2007). From a cognitive perspective, the motivation mechanisms concerning KS can be correspondingly classified into these underlying processes as follows:

Internalization: The motivation mechanisms attributed to this commitment are from the inside of people (Malhotra & Galletta, 2005). People value the content of KS behavior itself and appreciate the values of KS, which accord with their own values; for instance, people regard it as the realization of self-worth that their KS would improve team work processes and increase work efficiency.

Identification: It pertains to social–psychological forces (Bock et al., 2005), which emerges on condition that people’s intentions to KS proceed from the pursuit of reciprocal interpersonal relationships. By means of KS, they envision the maintenance and achievement of satisfying and self-defining interpersonal connections with others, especially those who are involved in knowledge provision and reception (Bock et al., 2005; Hwang & Kim, 2007).
As against internalization that stems from KS behavior itself, in the process of identification, people's satisfaction is derived from the acknowledgement of others.

**Compliance**: The motivation mechanisms allocated in this commitment are completely from outside. It occurs when people's intentions to KS are merely drawn by rewards or punishments and they have perceived that extrinsic rewards or punishment consequences outweigh the potential participant costs (Malhotra & Galletta, 2005).

Furthermore, another conspicuous psychological phenomenon concerning interpersonal interactions, “herd behavior” attracted our attention. Herding exposes a real occurrence that an individual’s behavioral decision is influenced by others to such an extent that an individual entirely adopts others’ decisions instead of his own (Bikhchandani, Hirshleifer, & Welch, 1998). More specific to our study, there is a situation where an individual’s KS attitude is only an echo of the majority’s opinions on the team. Therefore we complemented Kelman’s three commitments with a new commitment “conformity”, which occurs when an individual accepts KS owing to the blind reliance on other people’s attitudes.

Thus, the functional mechanisms of KS motivations can be integrated into these four psychological processes: internalisation–identification–conformity–compliance. For any subject’s motivation, the four commitments can synchronously function in their respective spheres and to different extents. Consequently a personal motivation mechanism can be viewed along a continuum with mechanisms that contribute individually or in between with a combination of different mixed commitments.

For the convenience of measuring the commitments, when building our model we endowed them with the meanings of their direct indicative results caused by these processes. That is, *internalization* here concerns the degree to which people endorse the values of KS itself, and *identification* concerns the degree to which people believe they can obtain satisfying relationships and be identified with referent groups via KS. Specially, since *conformity* does not come without the influence of social norms, here it was defined as the degree to which one believes that others expect one to share knowledge multiplied by the degree of one’s conformity with each of one’s referents.

Internalization and identification are based upon personal norms that reflect an individual’s beliefs as to whether s/he should share knowledge (Malhotra & Galletta, 2005). Personal norms will act upon internalization and identification to intrinsically guide KS behavior and determine the level of acceptance of KS (Malhotra & Galletta, 2005; Venkatesh, Morris, Davis, & Davis, 2003). The attitude represents the degree of private acceptance of KS behavior (Hwang & Kim, 2007). As a result, the two commitments will help to project a positive influence on the attitude. Thus we supposed that:

**H1.** Internalization has a positive effect on the attitude.

**H2.** Identification has a positive effect on the attitude.

The theory of reasoned action (TRA) indicates that the attitude and the social norms have concerted efficacy in determining the ultimate intention (Fishbein & Ajzen, 1975). As a direct reflection of TRA, we hypothesized that:

**H3.** The attitude toward KS has a positive effect on the intention to share knowledge.

The social norms are defined as an individual’s perception pertaining to important others’ expectations on his/her KS (Fishbein & Ajzen, 1975). They operate through an individual’s beliefs as to whether others who are of importance to her/him think s/he should share knowledge. The concept of social norms is of importance to our model, since it acts as one’s interior interface reflecting external influences. In contrast to personal norms, social norms are the source of conformity and compliance.

In quite a few research models applying TRA, social norms were empirically supported to have positive impacts on both the intention and the attitude (Bock et al., 2005; Hwang & Kim, 2007; Quigley et al., 2007). Some scholars have addressed the effects of social norms on attitude would be manifest via the pathways of internalization and identification (Hwang & Kim, 2007; Lewis, Agarwal, & Sambamurthy, 2003). While in light of herding, the effect of social norms on attitude can also be expected to perform through the psychological pathway of conformity. The direct effect of social norms on intention will be manifest via the commitment of compliance (Malhotra & Galletta, 2005); however, compliance has little effect in voluntary contexts (Hwang & Kim, 2007), and it is hard to compel KS in mandatory systems (Bock et al., 2005; Malhotra & Galletta, 2005). Thus the social norms will not directly impact the intentions to KS via compliance. They will alter the attitude via volitional commitment (i.e. internalization, identification, and conformity), and subsequently impact the intentions. So we assumed that:

**H4.** The effect of the social norms on the intentions is fully mediated by internalization, identification and conformity.

Compliance cannot lead to any change in the level of private acceptance. It is induced by financial rewards and punitive measures. For the following cross-cultural comparison on compliance; we divided it into two parts respectively with regard to reward...
incentives and punitive measures. The reward incentive in compliance can be defined as the likelihood that people believe they can obtain rewards for their KS. As for punitive measures, the intention to KS cannot be forced simply by tangible and explicit punitive measures (Gibbert & Krause, 2002). The so-called “punishment” associated with KS is mainly referred to as at least punishment. It can be defined as the degree to which people believe they can be expelled or disapproved from a team for not sharing their knowledge.

Some prior research on reward incentive pointed out that it could have a little effect or even be dysfunctional by themselves (Bock et al., 2005; Bock & Kim, 2002; Brown & Duguid, 2002; Quigley et al., 2007). Typically, these studies examined the direct linkage from rewards to the intention to KS and found it insignificant or even negative (Bock et al., 2005; Bock & Kim, 2002). From the standpoint of the current study, this relationship can be attributed to the commitment of compliance. As some studies indicated, compliance can operate only in mandatory contexts and cause the direct change on intention (Hwang & Kim, 2007). Since KS is primarily a self-determined activity per se, it cannot be mandated (Bock et al., 2005; Lin, 2007). As a result, we can hypothesize that:

**H5.** The reward incentive has no significant direct effect on the intention.

Osterloh and Frey (2000) just discussed the crowding effect of rewards. A crowding-in effect can be produced if pay is accompanied by nonfinancial social recognition strengthening perceived competence, and a crowding-out effect occurs when the impetus for an action is attributed to external intervention and the perceived cognitive self-determination is undermined. Given the volitional nature of knowledge sharing, KS cannot be explicitly or directly rewarded, and simply forced by tangible and explicit punitive measures (Bock et al., 2005). Therefore the impetus for KS is mainly attributed to the intrinsic motivation not to external intervention. This proposition is also in line with H1, H2, H4 and H5. Further, many prior studies have found that the direct linkage from rewards to the intention to KS is insignificant or even negative (Bock et al., 2005; Bock & Kim, 2002; Brown & Duguid, 2002; Quigley et al., 2007). That means the extent to which employees comply with the external intervention is low. On the other side, in practice it is hard to detect the extent to which employees engage in KS, so it is impossible that the upper management can set and quantify tangible incentive and punitive measures to control employees’ KS (Lin, 2007); thus we can infer that the extent to which individuals perceive the controlling aspect of rewards in KS is low. Taken together, there is a lack of the necessary qualifications for producing a crowding-out effect. Meanwhile, some case studies of KS practices indicated that appropriate rewards have symbolic function and can represent the glory and the recognition, which finally lead to more active KS (Hsu, 2006; Siemsen et al., 2007; Taylor, 2006). That is, employees can perceive organizational recognition strengthening perceived competence, when receiving an appropriate reward for their KS. Apparently, this kind of perception can contribute to the buildup of the commitment of identification, and also presents the achievement of a crowding-in effect. Thus we hypothesized that:

**H6.** The reward incentive has a positive effect on identification.

As the most commonly applied motivator, extrinsic rewards have been in the “tough middle” for extant research. Some scholars evidenced that they were effective in motivating employees’ KS (Ewing & Keenan, 2001; Hyung & Moon, 2002; Kelley & Thibaut, 1978), whereas others pointed out that they could have a little effect or even be dysfunctional by themselves (Bock et al., 2005; Bock & Kim, 2002; Brown & Duguid, 2002; Quigley et al., 2007). A comprehensive synthesis on H5 and H6 can uncover the in-depth personal cognition toward rewards, and provide a foundation for us to reconcile this inconsistency. That is, as the latter presented rewards do not directly stimulate the intention to KS by themselves via compliance, but they can impact the attitude toward KS through the buildup of identification and in turn impact the intention, which helps to explain the findings of the former.

H1 to H6 were allied to depict our basic cognitive model of KS motivation, which also served as a model of KS intention formation. Alien to the previous motivation model that separately specified the influence of each external or internal factor on the attitude and the intention, this model integrated the influences of all KS motivators into the multidimensional commitment in the systematic way. Grounded on this model, the impact of national culture would be taken into consideration.

### 2.2. Cross-cultural research

As a number of scholars suggested, individual beliefs and attitudes partially rely on the social circumstances to which they belong (Srite & Karahanna, 2006). Therefore, the approaches and findings concerning KS motivation drawn from the studies in single national context may be only relevant to their rooted cultural environments but the applications to different cultural settings are questionable (Hofstede, 1984; Weir & Hutchings, 2005). Consequently, cross-cultural research beyond the boundaries of single national backgrounds on this phenomenon is such crucial and valuable in the context of increasing economic globalization.

In KS motivation realm, though the bulk of previous research has been undertaken in single national contexts (mostly Anglo-American), or in which the presupposed behavioral tendency was culture-bound (Chow et al., 2000; Weir & Hutchings, 2005); there still exist some studies with a focus on cross-national and culture-moderated KS issues. They captured some general cross-culture motivational issues (Geng, Townley, Huang, & Zhang, 2005) and lent some conceptual frameworks for analyzing the main differences of KS between countries (Chow et al., 2000; Griffith, Myers, & Harvey, 2006; Lam, 1997; Weir & Hutchings, 2005). Therefore these studies can lay the groundwork for our analysis of the linkage between culture and KS issue. The current study can just reinforce the kindred studies by penetrating into the cognitive mechanism of KS using a cultural lens.

### 2.3. National culture and hypotheses

Even though there have been numerous studies on national culture, the work of Hofstede is unarguably best known (Straub, Loch, Evaristo, & Karahanna, 2002). Since this cultural framework is underlain by norm- and value-based analysis, it is appropriate to our study.

Cultural was defined by Hofstede as “the collective programming of the mind which distinguishes the members of one human group from another” (1980, p. 260). Further, Hofstede and Bond (1988) proposed five dimensions: “power distance”, “collectivism/individualism”, “masculinity/femininity”, “uncertainty avoidance”, and “long-term orientation/short-term orientation”. A country can be pitched along these five dimensions to confirm its cultural type (Griffith et al., 2006).

Comparing raw scores on dimensions for China with those for the US measured by Hofstede’ model (2001), three dimensions: collectivism/individualism, power distance and long-term orientation/short-term orientation can be detected to portray the cultural divergence between Americans and Chinese. Collectivism/individualism defines the degree of acting as members of cohesive groups (Hofstede & Bond, 1988). Power distance represents the degree to which person accepts inequality as normal and fair (Hofstede & Bond, 1988). Especially, long-term orientation (LTO) is the most remarkable Chinese cultural characteristic, which grounds the morality and ethic standards in Chinese communities
The cultural value of collectivism compels Chinese to rely more on the collective power than on their own (Hofstede, 2005); the cultural value of large-power distance dominates Chinese to have strong dependence needs and a blind faith in upper management’s abilities over their personal power (Tsui, 2001); and LTO also stresses a sense of hierarchy and the respect for authority (Tsui, 2001). Michailova and Husted (2003) articulated that accepting and respecting a strong hierarchy would lead to the unawareness of the value of employees’ ideas and involvements. On the contrary, the norms of Americans just emphasize the personal abilities and contributions, and equality (Hofstede, 2005). One of the underlying traits of knowledge sharing is just peer-to-peer exchange and it gives prominence to every share of knowledge and strength devoted by each team member (Bock et al., 2005; Hwang & Kim, 2007). Since the American notion is more consistent with the inherent values of KS, we supposed that:

**H7.** American employees perceive a stronger feeling on internalization than Chinese employees.

Collectivistic cultural orientation and LTO espoused by Chinese have been tightly coupled with the social network and emphasizes the importance of the group identity (Shin, Ishman, & Sanders, 2007; Triandis, 2004). So in a China-featured group, members identify themselves in a network of relationships (Hofstede, 2005; Tsui, 2001) and they likewise judge other members according to the degree of their participation in collective activities. In this way, Chinese employees are more inclined to engage in interactive actions in pursuit of the recognition from referent groups, such as more respect from others and a better reputation (Shin et al., 2007). As a group activity, KS directly reflects interactions and participation among team members (Hwang & Kim, 2007). Subsequently, in the Chinese context the members who have performed KS will more likely attain the identification of group and accordingly will perceive this type of identification more observantly. This led to another hypothesis:

**H8.** Chinese employees perceive a stronger feeling on identification than American employees.

Chinese people more likely affiliate themselves to be adjuncts to the groups and the upper management and obey the given rank and orders (Weir & Hutchings, 2005). Further, Chinese believe that the opinions of groups are more likely better than individuals’ (Chow et al., 2000; Huang et al., 2008; Tsui, 2001), so they are disposed to defer to the decisions and the opinions of superiors and groups at discretion (Huang et al., 2008). Also according with the research of Bond and Smith (1996), we hypothesized that:

**H9.** Chinese employees perceive a stronger positive association between conformity and the attitude than American employees.

In Chinese context, employees are warned that it is dangerous to contravene the orders of groups (Hofstede, 2005). With a reference to the study of Griffith et al. (2006), we can deduce that it is not rooted in Chinese people’s intrinsic nature that they prefer to integrate themselves into the group, but rather that they do so for the sake of their own long-term interests. The existence of mutual monitoring and sanctioning systems in the corresponding referent groups ensures that Chinese people curtail self-interest based behaviors (Griffith et al., 2006). In Chinese society, people have to undergo great social pressure for their self-centered actions. Consequently, under the given system of mutual surveillance, the risk of being expelled from a team is taken as the cost and the penalty for rejecting KS. Considering Chinese inherent cultural values, this sort of cost is possibly high enough to exceed the cost of engaging in KS, so Chinese would rather comply with the request of KS. Therefore we supposed that:

**H10.** The latent punishment has a positive effect on the intention for Chinese employees.

Quite the contrary, in American society, mutual monitoring and sanctioning systems are very weak due to the inconsistency with the American cultural values (Griffith et al., 2006). American society can tolerate aberrant behaviors to a greater extent (Hofstede, 1980). Americans encounter the rejection for their alien actions to a minimal degree. Hence, they have the minimal sensitivity to be aware of the latent rejection from teams. Even though Americans have recognized this threat; derived by the natural instincts of self-center and low-power distance, they still give priority to self-determination and independence and do not stress the importance of belonging to groups counter to their own inclinations (Tsui, 2001). Especially for KS that is mainly based on peer-to-peer and reciprocal activities, Americans will frown upon and even stem the torrent of too much pressure imposed on individual KS tendency. Thus we posited two other hypotheses:

**H11.** Chinese are more aware of the latent punishment than Americans.

**H12.** The latent punishment has a negative effect on the intention for American employees.

### 3. Research methodology

To verify the proposed hypotheses, we employed the survey method for data collection and the Partial Least Squares approach to structural equation modeling (PLS) (Chin, 1998) for data analysis.

#### 3.1. Measurement and data collection

Our original survey instrument was developed by either adapting the possible validated measures or transforming the definitions of constructs into a question format. Specifically, the items about Kelman’s commitments were derived by synthesizing the research of Malhotra and Galletta (2005) and Bock et al. (2005), the items concerning “conformity” were founded on the relevant theories and definitions. The items regarding the social norms were adapted from the research of Malhotra and Galletta (2005). The items measuring the attitude and the intention were adapted from Bock et al.’s research (2005).

To improve and examine our survey instrument, a pilot study was undertaken in a research institute of knowledge management where about 80 members are from different organizations with diverse cultural backgrounds and have a common interest in knowledge management. We developed an online survey website and posted the URL to the list server of this institute. In the survey system, we set aside the spaces of open-ended comments on each question and the whole scale. Then we received 35 completed responses from the website with some valuable comments on some questions or the whole instrument. These subjects were excluded from later analysis. Some items were added or deleted and the representations to other items were improved thanks to the received feedback. Finally, the internal consistency and discriminant validity of the constructs were evaluated; most of Cronbach’s alpha values were higher than the 0.70 high reliability criterion, except the latent...
punishment whose value was 0.62. Due to low item-to-total correlation (0.31), one item in the latent punishment was eliminated. After that, the corresponding Cronbach's alpha value was heightened to 0.78. These results suggested that the improved survey was appropriate for the further administration.

The instrument of English version was translated to Chinese. Backward translation was applied to ensure consistency between two versions (Mullen, 1995). The bilingual survey instrument was used to collect the data from organizations respectively in the US and China. A total of twenty organizations (ten in the US and ten in China) across 10 industries were invited to participate in this survey. Before launching the online survey, interviews were conducted respectively with one or two individuals who were either the team leaders or the chief knowledge officers in each organization, the aim of this investigation and each question in the instrument were explained. Then they were assigned to explain the purpose of this survey and the question and disseminate the survey instrument on their organizational intranet or list servers, so that the rest of the organizations would have a clear picture of the survey purpose and answer questions without misunderstanding.

There were two qualifications for the subjects:

- The experiences of team cooperation and knowledge sharing were needed. Otherwise, the answers to the questionnaire cannot reflect individuals' actual responses to practical situations where knowledge sharing is going to occur. Based on this qualification, the employees on R&D teams or R&D centers would be the main part of subjects, since R&D teams or R&D centers are typical knowledge-concentrated departments in companies and KS is prominent and required to the most extent there.
- To ensure the typicality of inter-national comparative results, only the subjects with the "pure" cultural backgrounds were required. That is, the employees who not only are working in the US but also were born and educated in the US, and those who not only are working in China, but also were born and educated in China were selected respectively as our American and Chinese subjects.

In addition, many scholars have taken “trust” as an important influencing ingredient in KS, which accounts for the discrimination between in-group members and out-group members especially in the Chinese-based cultural setting (Huang et al., 2008; Weir & Hutchings, 2005). To prevent the contextual constraints induced by “trust” from concealing the cultural embedded differences in the cognitive process itself, we would confine our subjects to those who have worked in the present organizations over one year, which would be a long enough period to foster trust and in-group feelings.

Finally 149 responses and 131 responses respectively from China and the USA were obtained. The accurate total response rate cannot be obtained, since the data collection process basically proceeded through the online survey system. However, the subjects mainly come from the R&D teams or R&D centers; in our case we can probably infer that the average number of potential respondents for each organization is about 30 (no more than 50). Thus the total number of all possible potential respondents is about 600 (no more than 1000); and we can deduce that the total response rate is about 46.67% (no less than 28%). After eliminating some incomplete and invalid data, we finally selected 100 Chinese responders and 100 American responders for further analysis. Table 1 shows the 200 respondents’ characteristics according to demographics.

### Table 1
Demographics information of respondents.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Items</th>
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<th>Measure</th>
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<tbody>
<tr>
<td>Gender</td>
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<td>Age</td>
<td>Under 25</td>
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<td>8</td>
<td>19</td>
<td>China</td>
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<td></td>
<td>Female</td>
<td>56</td>
<td>Work experience</td>
<td>25–29</td>
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<td>58</td>
<td>China</td>
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<td>24</td>
<td>58</td>
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<td>30–34</td>
<td>26</td>
<td>22</td>
<td>48</td>
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<td>35</td>
<td>China</td>
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<td>45</td>
<td>50</td>
<td>95</td>
<td>China</td>
</tr>
</tbody>
</table>

### 3.2. Data analysis
The research hypotheses were validated using PLS. As a widely employed structural equation modeling technique, the advantages of PLS for latent variable modeling have been exhaustively addressed by Chin (1998). We adopted it since it allows latent constructs to be modeled either as formative or reflective indicators as was the case with our data, and it has the minimal demands on measure scales, sample size and residual distributions.

#### 3.2.1. Measurement model
The reliability and discriminant validity of the measurement model were assessed using PLS. The criteria for acceptable constructs adhered to the studies of Chin (1998) and Fornell and Larcker (1981).

The composite reliabilities and the average variance extracted were calculated to assess the reliability. The results in Table 2 showed that the composite reliabilities of all items were above the 0.70 recommended level, meantime, the average variances extracted by our measures, which ranged from 0.53 to 0.82, were above the acceptability value of 0.5. The results of confirmatory factor analysis were presented in Table 3 and showed all items met the condition of the lower limit 0.70 loading criterion except CON3 and ATT2. Since they did not cross-load and can help to minimize residual variance, they were decided to retain in the analysis.

### Table 2
Results of confirmatory factor analysis.

<table>
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<tr>
<th>Items</th>
<th>Composite reliability</th>
<th>Average variance extracted</th>
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</tr>
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</table>

INT: internalization; IDEN: identification; CONF: conformity; REWA: reward incentive; PUN: latent punishment; SN: subjective norm; ATT: attitude toward KS; INTEN: intention to KS.
In addition, social norms consisted of indicators in a formative mode, so they were not restricted by the 0.70 loading criterion.

To evaluate discriminant validity, the following steps were adopted. First, Table 3 shows that the loadings of indicators on their respective constructs were higher than the cross-loadings on other constructs. Second, Table 4 presents the square root of the average variance extracted for each construct (leading diagonal in Table 4) was greater than the inter-construct correlations.

Also the measurement model was validated using the same formula respectively with Chinese and American data included. The corresponding detailed processes were left out here. All these results suggested that the instrument exhibited enough psychometric properties.

### 3.2.2. Structural model

The basic model was run with all data from both the US and China included to validate H1–H3, H5 and H6. To assess the mediating effect of the commitments, as postulated by H4, we followed Chin, Marcolin, and Newsted (2003) to use the formula respectively with Chinese and American data included.

![Fig. 2. PLS test of direct effects without mediating variables.](image)

### Table 4

<table>
<thead>
<tr>
<th>INT</th>
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<th>PUN</th>
<th>SN</th>
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### Table 5

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### Table 6

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INT: internalization; IDEN: identification; CONF: conformity; REWA: reward incentive; PUN: latent punishment; SN: subjective norm; ATT: attitude toward KS; INTEN: intention to KS.

* Significant at 0.1.
** Significant at 0.05.
*** Significant at 0.01.
action effects of the social norms and the country variable, which
were described as H7 and H8. The country variable was directly
pointed at the latent punishment in the basic model, and then PLS
procedure was run to verify its direct influence as H11. For verifying
H10 and H12, the basic model was run twice respectively with the
data from the US and China included. The significance of the paths
was tested using the T-statistic calculated with the bootstrapping
technique.

As presented in Table 5, about 55% of the variations in the inten-
tion and 42% of the variation in the attitude were explained from
our basic model, and the hypotheses of H1–H3, H5, H6–H9 and H11
were all supported as we expected.

As indicated in Table 6, H10 and H12 were both supported;
H1–H3, H5 and H6 included in the basic model also can be
applicable in the pure China-based cultural setting and the pure
Anglo-American cultural setting. In particular, transcending the
previous understanding, here the moderating effect of cultural con-
text on conformity was visualized in a more direct manner, i.e.
conformity positively impacts the Chinese attitude but has a non-
significant effect on the American attitude.

The criteria for assessing the fully mediating effects (H4) were
all met as follows: (1) shown in Fig. 2, the social norms had a
significant direct effect on the intention without the presence of
other paths ($B = 0.231, p < 0.01$); (2) the social norms have sig-
nificant effects on internalization and identification as shown in
Table 5 and the definition of conformity includes the impact of the
social norms so their positive impact on conformity is innate; (3)
shown in Fig. 3, with all the paths included, the previous signifi-
cant effect of the social norms was dropped to be nonsignificant
($B = 0.075, n.s.$).

4. Discussion and implications

4.1. Discussion of findings

This study mainly focused on two aspects: (1) the inherent
cognitive mechanism concerning KS motivation; (2) the influ-
ence of national cultural values on this cognitive mechanism. 12
hypotheses respectively associated with the two aspects were pro-
posed, and a survey was conducted in both China and the US to
validate them. Accordingly some very interesting findings were
yielded.

Specifically, because KS is primarily a self-determined activ-
ity per se and it cannot be explicitly or directly rewarded (Lin,
2007), an individual’s attitude toward KS is a primary determi-
nant that influences the ultimate intention to KS. The attitude
is driven by the effects of personal and social norms. Personal
norms present intrinsic motivation and their effect is manifest
via psychological pathways of internalization and identification.
Social norms act as one’s interior interface reflecting external
influences and their effect is manifest via the pathways of inter-
nalization, identification and conformity. Especially emphasized,
it deviates from the conventional understanding that rewards do
not directly stimulate the intention to KS by themselves, but they
will impact the attitude toward KS through buildups of identifica-
tion.

The effect of the latent punishment is context sensitive: in
Chinese-based cultural background, people support acquiescence
to KS to avoid punishment; however, in American-based cultural
background, people are inclined to disregard fear of punishment.
Further, Chinese appear to have more tendencies to conform to
groups’ opinions and tend to favor KS as a means of achieving har-
nomious relationships within the group; while Americans appear
to engage in KS because self-worth is viewed as the manifestation
of their individual determinations.

4.2. Implications for theory and practice

Given the trends for extended global cooperation, the question
on how to effectively motivate KS especially under the context of
cross-nations is becoming more and more important. This study
proposed a cognitive model of KS motivation in the view of a
cross-culture environment to contribute greater insights to this
question.

In theory, we integrated the cognitive perspective of knowledge
sharing from a cross-cultural context and revealed the cognitive
mechanism of KS motivation. We employed as our theoretical
framework the social influence theory and augmented it with new
commitment “conformity”. Based on it, the functional mechanisms
of both intrinsic and extrinsic motivation can be integrated into four
underlying psychological processes “through the eyes of action sub-
jects”. These underlying processes embrace both the predisposed
personal belief in KS and the cognitive conversion induced by exte-
rior impacts. Thus it deepens our understanding of KS motivation
mechanisms from individual cognitive perspective and helps to
provide more effective measures to judge individual inclinations
and behaviors toward KS. Especially, our findings reconcile the inconsistency in
the existing research on the effect of extrinsic rewards and recruits
the extant motivation theories, namely people generally were in
agreement on not sharing their knowledge simply to receive a
reward; however, if the rewards led to a higher identification profile
for KS it augmented a positive attitude toward KS.

Furthermore, our study was based in a cross-cultural con-
text (Chinese and American). As such it extended the research
explorations beyond the large body of knowledge that exists
on single-culture research findings. Thus our research led to
discernible comparisons between cultures and provided the impor-
tant and essential insights to reinforce the prior literature. For
example: in a Chinese-based context, social norms impact an
individual’s attitude toward knowledge sharing not only through
internalization and identification (as proved by Western theories)
but also through a volitional commitment of conformity. Another
example, individuals in an Anglo-American context seldom com-
ply with the threat of latent punishment to share knowledge,
it is a contrast to a Chinese-based cultural context. Chinese and Americans respectively have different sensitivities to the affective commitment. Chinese inclinations toward KS are more likely encouraged by others’ appreciation, while Americans tend to accept KS as the realization of self-worth and the manifestation of their individual determinations.

We hope this study will provide a general framework and methodology that other behavior incentive studies can utilize. Furthermore, we would encourage future researchers to place more emphasis on cross-cultural studies on behavioral motivation throughout the discipline of information management.

In practice, we believe this study provides some “golden nugget” useful insights for cooperation management and human resource management in multinational corporations and multinational teams. Especially since individuals from diverse nations have different sensitivities to each sort of KS motivation. The managers should place emphasis on different incentive measures according to the embedded national culture. This study provides an example for subsidiaries and teams respectively set in China and the US. The results can be extended to the entire Anglo-American and Chinese-based cultural contexts, and also can be a reference to the related issues in other cultural contexts.

First, the extensive communication and dissemination of KS benefits and values would provide an effective mechanism to encourage KS. More specifically, since American employees seemed to favor visibility into their personal abilities and commitment to KS, a system that can bring their KS contributions into view should be a more effective mechanism to spread KS for that organization.

Second, on an organizational level it would be wise in this situation to make such recognition well known. Since Chinese are more sensitive to others’ appreciation when seen as good contributors, the appropriate compliments to the Chinese employees who actively engage in KS would reinforce their favorable attitudes toward KS.

Third, the social influence across the organization would act as an effective means of inspiring all employees to KS. The relative measures may include: facilitating the formation of active referent communities within organizations, and highlighting some examples who take active part in KS. These measures may be more effective within Chinese subsidiaries or teams since Chinese appear to have more tendencies to follow each other. Especially, considering Chinese culture of large-power distance, the good examples of the leaders’ KS behaviors may effectively motivate employees to follow (Huang et al., 2008).

Notably, extrinsic rewards need to be used with caution in practice. The appropriate rewards may be comprehended to be a kind of approval and inspiration, nevertheless never go beyond surplus.

Furthermore, since the punishment might hinder the development of positive intentions to share knowledge for Americans, in American-based setting top management should cautiously push too much pressure on employees’ KS with their power and prestige.

5. Limitations and future research

It should be noted that this study had some kinds of limitations. First, our approach of assessing individuals’ opinions was subordinated to the presumption that the meanings of the scales would be consistent across nations and that any numerical expected reaction should reflect the same endorsement degree across nations (Srite & Karahanna, 2006). Neither is it true that people from different cultural backgrounds consider the questions in the same manner (Wang, 2004). In this study, through the extensive open-ended interviews, we have sought to normalize comprehension and response to the scales as much as possible. Future research is needed to develop less cross-cultural sensitive scales on this issue.

Second, the results stemming from our sample might not be generalized beyond the specific conditions of this study, since the sample was voluntary and might have a self-selection bias (Wang, 2004). In addition, the survey only covered the north of China and the east of the US; therefore, the sample might not be proportionally representative of the entire populations in both countries. Future research is needed to expand the scope of investigation to other parts of these two countries.

Third, the data collection process was conducted basically through the online survey system, so it is uncontrollable to some extent. Furthermore, for protecting the privacy of every responder, there is no any item which can identify the responders and the companies they are from. Therefore we have no idea about the accurate spread of the sample over the 20 organizations. It may threaten the external validity in this study. However, there are two facts that might provide some positive hints: it is most possible that people respond to the questionnaire within one or two days right after receiving the request for survey participation; and we contacted these companies almost in different periods of time. Therefore, based on each respondent’s response date that the survey system automatically recorded, we can get some information about the spread. Thus through the analysis on the respondents’ response date, we can probably believe that the spread is acceptable and there is no extreme case. We suggest that readers should be aware of the shortcomings in the sampling. Further research will be conducted to test the model in more controlled samples.

Fourth, it seems that only the kind of organizations that have taken knowledge sharing as an important issue would like to participate in this survey. So the model and conclusions may have only relevance for organizations where knowledge sharing is already a priority. It may limit our comprehension of overall behavior tendency toward KS to some extent, however, the matter is that only this kind of organizations really need KS and are eager to increase the level of KS among employees. Thus we focus the objective of this study on providing some valuable implications for this kind of organizations.

Fifth, another intrinsic limitation is concerned with the analysis of causality. The survey method can only provide cross-sectional data instead of longitudinal data, so every linkage in our model illuminates the vector of influencing relationship rather than strong causal relationship (Bock et al., 2005).

Finally, though all types of external influences can be presumed to operate through our model in theory, the current study is limited as it relates to survey parts of external factors. The influences of external factors are supposed to be exerted through the social norms, and we chose to overlook direct survey of overall external factors such as organizational culture or climate. In the future we will expand the scope of the survey to all external factors, and empirically verify the mediating effect of the basic model on all external factors.

Acknowledgements

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Appendix A. Questionnaire items and descriptive statistics by construct

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>INT</td>
<td>1. My knowledge sharing would help other members in the team to solve problems.</td>
<td>Alpha = 0.83, mean = 4.19, SD = 0.65</td>
</tr>
<tr>
<td></td>
<td>2. My knowledge sharing would improve team work processes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. My knowledge sharing would help the team achieve its performance objectives.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix A (Continued)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDEN</td>
<td>1. I will share my work reports and official documents with members of my organization as much as possible.</td>
<td>Alpha = 0.88, mean = 3.93, SD = 0.76</td>
</tr>
<tr>
<td></td>
<td>2. I will provide my manuals, methodologies and models for members of my organization.</td>
<td>Alpha = 0.84, mean = 4.14, SD = 0.61</td>
</tr>
<tr>
<td></td>
<td>3. I intend to share ideas with team members as much as possible.</td>
<td>Alpha = 0.89, mean = 4.05, SD = 0.67</td>
</tr>
<tr>
<td></td>
<td>4. I intend to share my experience or know-how from work with other organizational members as much as possible.</td>
<td>Alpha = 0.84, mean = 4.14, SD = 0.61</td>
</tr>
<tr>
<td></td>
<td>5. I will provide my know-where or know-whom at the request of other organizational members as much as possible.</td>
<td>Alpha = 0.89, mean = 4.05, SD = 0.67</td>
</tr>
<tr>
<td></td>
<td>6. I will try to share my expertise from my education or training with other organizational members as much as possible.</td>
<td>Alpha = 0.84, mean = 4.14, SD = 0.61</td>
</tr>
</tbody>
</table>

References


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