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A STUDY OF THE COGNITION-ACTION GAP IN KNOWLEDGE MANAGEMENT

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Abstract

We investigated three types of volitional control mechanisms that may impact people's knowledge management (KM) practices. Our results show that, when employing KM, people do not always perform in a manner consistent with their beliefs concerning attitudes and intentions. This cognition-behavior inconsistency can be explained by volitional control mechanisms. Specifically, both perceived self-efficacy (Bandura 1997) and action control (Kuhl and Bechmänn 1985) play a role in motivating individuals to share and use knowledge, while perceived behavioral control does not. In addition, action/state orientation moderates a person's enactment of subjective norm and self-efficacy beliefs into intentions just as it moderates enactment of perceived behavioral control belief into behaviors. These results have important theoretical and managerial implication.

Keywords: Knowledge management, perceived behavioral control, self-efficacy, action control

Introduction

"Knowledge has become the key economic resource and the dominant—and perhaps even the only—source of comparative advantage" (Drucker 1995). In trust, some theorists see knowledge management (KM) as a matter of extracting the right knowledge from a person's memory and storing it in networked computers for later distribution (Srikantaniah and Koenig 1999; Tiwana 2001). The emphasis is normative, mainly on codification and discovery of law-like relationships between knowledge parts. The review by Schultze and Leidner (2002) has confirmed this bias toward normative research in knowledge management.

Yet, the contribution of various codified KM systems to business profitability has not lived up to expectation. McDermott (1999) concluded that information technology could inspire but could not deliver knowledge management and that many KM systems were "an expensive and useless information junkyard." Ruggles (1998) indicated that information technologies would not bring down organizations' greatest knowledge-sharing barriers. Pfeffer and Sutton (1999) pointed out that exercise of knowledge

management by many organizations was "an unfortunate emphasis on technology, particularly information technology." Husted and Michailova (2002) also emphasize that IT alone cannot solve the challenge of systematic knowledge sharing. Finally, Dixon (2000) pointed out that "build it and they will come" and "technology can replace face-to-face interaction" were the myths of knowledge sharing.

In Taiwan, a similar phenomenon has been observed. An Internet-based KM system, called SCT-net, has been put in place to facilitate teachers' KM tasks. With the aid of the government, more than 40,000 people, most of whom are teachers, joined SCT-net over a period of three years. While most members have indicated their desire to create, store, distribute, and discuss their teaching knowledge, the actual KM activities on SCT-net have not reflected this desire. Why? It appears we have encountered a problem that psychologists call inconsistency between cognition and action. The teachers certainly possess knowledge that is potentially useful to others, and need to learn from others in order to fulfill their ever-demanding daily teaching assignments. But they simply fail to enact their desire to conduct knowledge management tasks.

Indeed, according to David Owens, vice president of KM at Unisys Corp., for expert knowledge, only 2 percent is actually written down and the rest is in people's head (Husted and Michailova 2002). In examining successful KM cases such as British Petroleum, Hewlett-Packard, Chrysler and Daimler Chrysler, Sematech, and Siemens, Davenport and Völpel (2001) have found that these companies did not build a large electronic library of best practices, but focused on connecting people so they can think together. Similarly, Ruggles reported that effective KM depended more upon people than on IT; and Husted and Michailova stated that straight "knowledge sharing depends entirely on people." Thus, motivating individuals to share and use knowledge were the most critical factors for KM success.

But motivating people for knowledge-related behaviors is not simply a matter of making people aware of KM benefits and costs. This is because knowledge is a human act and residue of thinking (McDermott 1999), and is inextricably bound to human cognition (Thomas et al. 2001). It is highly sensitive to culture (Davenport and Prusak 1998) and to a person's will to change behavioral habits (McDermott's 1999; Ruggles 1998). Husted and Michailova revealed that knowledge sharing depends on the "willingness of individuals to signal possession of knowledge and share it when requested." Dixon emphasizes that an individual's "natural willingness to sharing" is an adequate basis for developing the knowledge transfer process.

What is this natural willingness? In psychology, the study of will, pioneered by William James, has been under way for over a century using the paradigm of volitional control which addresses the transition from cognition into action. People do not always perform in a manner consistent with their beliefs, values, attitudes, or intentions. The study of cognition-behavior inconsistencies requires observing self-regulatory mechanisms that control the transition from cognition to action. Thus, in this research, we have investigated three types of volitional control mechanisms: perceived behavioral control (Ajzen 1986), self-efficacy (Bandura 1997), and action control (Kuhl and Bechmänn 1985). These mechanisms have previously been applied to study self-regulatory mechanisms that mediate the execution of intentions into behaviors. We hope that our research can contribute to disclose the psychological control mechanisms that are critical to successful KM practices.

Theoretical Background and Research Hypotheses

Perceived Behavioral Control

Perceived behavioral control denotes subjective degree of control over performance of a behavior (Azjen 2001). It is a component of the theory of planned behavior (TPB), which, along with the theory of reasoned action (TRA), stands out as the most preferred attitude-behavior model adopted by researchers. TRA assumes that "most human social behavior is under volitional control and, hence, can be predicted from intentions alone" (Azjen 2001, p. 28). In TRA, Fishbein and Ajzen (1975) postulate that an individual intending to perform an action alternative has two basic determinants: attitude and subjective norm. While this theory has been shown to be useful in predicting actual behaviors in many functional domains, it has also suffered for behaviors that are not under total volitional control. As a result, the construct of perceived behavioral control, referring to the perceived ease or difficulty of performing a behavior, is added to deal with situations in which people may lack complete volitional control over the behavior of interest (Ajzen 1986). TPB has emerged as one of the most influential conceptual frameworks for studying human actions (Azjen 2001).

For KM practices, perceived behavioral control is critical for two reasons. First, if knowledge is a human act, then verbalizing this act (e.g., turning tacit knowledge into explicit knowledge) can be very difficult (Nonaka 1991). Second, sharing knowledge is unnatural for people who think their knowledge is valuable and important and are unwilling to share their knowledge (Davenport 1997; Davenport and Völpel 2001; Puccinelli 1998). Perceived behavioral control, therefore, influences one's "natural willingness" to be engaged in knowledge management practices.

Perceived Self-Efficacy

Perceived self-efficacy is defined as "people's judgments of their capabilities to organize and execute a course of action required to attain designated types of performances." It is concerned "not with the skills one has but with judgments of what one can do with whatever skills one possesses" (Bandura 1997). Self-efficacy is anticipatory, regulating both discrepancy production and discrepancy reduction in one's functioning. Thus, self-efficacy also reflects the judgments that an individual makes about his or her capabilities to mobilize the motivation, cognitive resources, and courses of action needed to orchestrate future performance on a specific task (Gist and Mitchell 1992). It is expected that perceived control over one's own performance will lead to enhanced self-efficacy beliefs whereas lack of perceived control will lead to lowered self-efficacy (Bandura 1991). According to Azjen (2001), perceived self-efficacy and perceived behavioral control are functionally similar in the sense that both deal with perceived control over the performance a certain conduct. But they differ in the types of volitional control measured: the former embodies control beliefs governing skills, knowledge, and conviction (Bandura 1997), while the latter focuses on the perceived ease or difficulty of performing a behavior.

For KM practice, perceived self-efficacy is important since successful KM requires behavioral modification (McDermott 1999; Ruggles 1998). The concept of self-efficacy, now central to the social cognitive theory, has been applied extensively to the study of behavioral modification and social learning.

Action Control

Kuhl's (1981, 1982, 1994a, 1994b) work on state versus action orientation is part of his more general theory of action control, which refers to self-regulatory mechanisms that mediate the enactment of action-related mental structures, particularly intentions (e.g., Kuhl and Bechmänn 1985). State versus action orientation indicates that a person has a general tendency to approach or avoid things in a static (passive) or dynamic (active) fashion. In Kuhl's view, people differ from one another regarding the proportion of intentions that they transform into behavior. Those with low self-regulatory capacity are called state-oriented and those with high self-regulatory capacity are called action-oriented.

Individuals with a strong action orientation are able to devote their cognitive resources to the task at hand, therefore enabling themselves to expediently move from a present goal state to the desired future goal state. These individuals flexibly allocate their attention for task execution and goal attainment, and are characterized by enhanced performance efficiency and the ability to complete tasks after minor failures (Kuhl 1994a). Conversely, individuals with more state orientation tend to have ruminative thoughts about alternative goals that reduce the cognitive resources available for goal striving. This reduction of available resources impairs the ability of state-oriented individuals to initiate activities and to follow tasks through to completion, especially when the activities are difficult, non-routine, or both (Goschke and Kuhl, 1993; Kuhl 1981; Kuhl and Bechmänn 1985).

The concept of action control is critical to KM practice in that it allows us to examine if any moderating effect exerted by one's action orientation on his or her KM practices exists. This is important because past research of KM failures (Davenport and Völpel 2001; Dixon 2000; McDermott 1999; Ruggles 1998) has shown that, in many cases, people believe in the process but lack the will to carry out the actions. The study by Bagozzi et al. (1992) indicates that attitudes influence intentions more strongly for action-oriented as opposed to state-oriented people. We can think of an attitude is an indicator of one's evaluation function for an action. But there is something missing: an explicit motivational force that transforms an attitude into the will for action (Bagozzi et al. 1992). Both are needed to convert intentions into form. State orientation implies low motivation or an absence of motivation to act. Hence, we expect that attitudes will have a stronger effect on intentions for action- versus state-oriented people. Bagozzi et al. also found that subjective norms influence intentions more strongly for state-oriented as opposed to action-oriented people. In addition, Kuhl (1982) reported that the correspondence between intentions and actual behavior was significantly greater for action-oriented than for state-oriented subjects. But for activities that people are induced to engage in for social reasons, intention-behavior correlations were higher in state-oriented than in action-oriented subjects. The later study by Kuhl and Bechmänn showed that, compared to state-oriented subjects, action-oriented subjects carried out a greater proportion of their intentions and motives. Finally, Bandura (1997) indicated that control beliefs (i.e., perceived behavioral control and self-efficacy) affect thought processes, the level and persistency of motivation, and affective states. The enactment of perceived behavioral control and self-efficacy beliefs, therefore, can be influenced by one's action orientation.

Based on the previous review, Figure 1 depicts our TPB-based research model. According to TPB, behavior intention (BI) is determined by attitude toward behavior (A), subject norm (SN), and perceived behavioral control (PBC). Attitude, subject norm, and perceived behavioral control are in turn the reflection of underlying cognition or beliefs. Note that in our model both per-

ceived behavioral control and perceived self-efficacy are included since they are functionally similar (meaning that they both influence the formation intention and execution of behavior) but differ in types of control beliefs. Table 1 lists the research hypotheses.
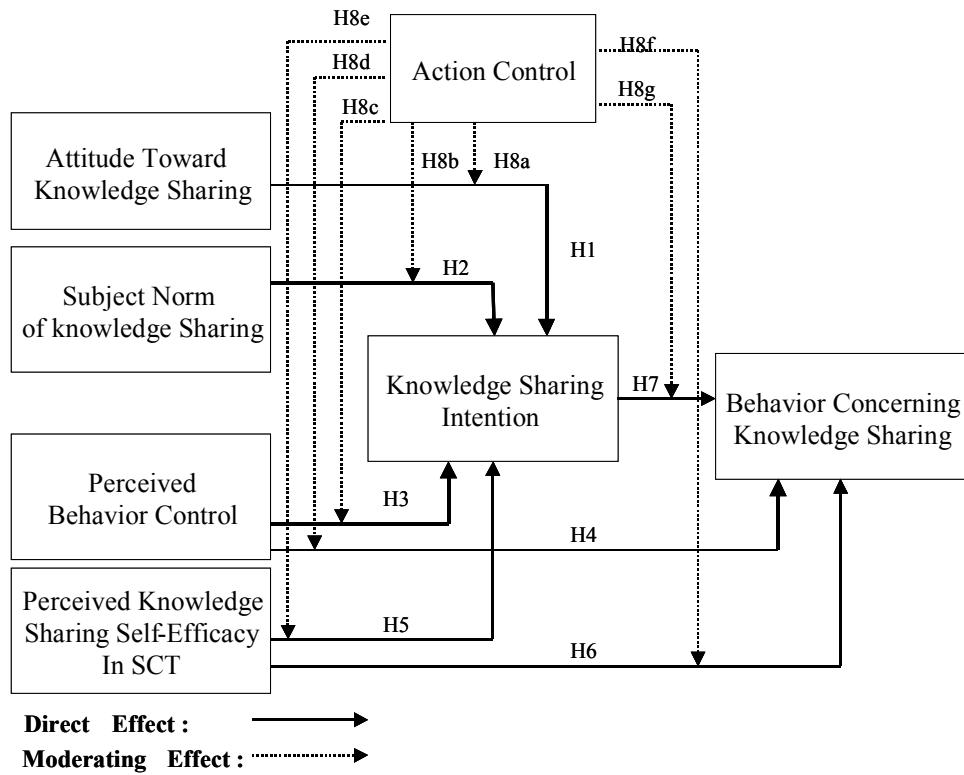

Figure 1. The Research Model

Method

Subjects and Procedure

SCTNet (**http://SCTNet.edu.tw**), a virtual professional community of teachers in Taiwan, served as the source of subjects for this study. Teachers were encouraged to discuss teaching skills, ideas, and materials. On-line questionnaires were distributed at the beginning of the fall semester, 2002. A total of 304 subjects completed questionnaires, and 264 of these were considered valid responses. SCTNet maintains a log of all members' activities which includes posting, discussion, and up-loading and down-loading of instructional materials. This activity log was later used for measuring the performance of KM practice.

Measures

Appendix A shows all items for this study. Knowledge sharing intentions are assessed with two items by asking respondents: "I will do knowledge sharing on SCTNet" (INT1) and "I will try to do knowledge sharing on SCTNet" (INT2). The attitudes toward knowledge sharing are assessed with three semantic scales: good/bad (A1), beneficial/harmful (A2), and wise/foolish (A3). Subjective norms are measured with three seven-point scales by asking respondents whether "I think my school principal (SN1), colleague (SN2), and peers in educational domain (SN3) support me in performing knowledge sharing on this Web site." The measure of perceived behavioral control includes four items (Ajzen 2002): "For me to use SCTNet is very easy" (PBC1), "If I want to, it is very easy for me to use SCTNet" (PBC2), "I believe that I have full control of using SCTNet" (PBC3), and "It is mostly up to me whether or not I use SCTNet."

Table 1. Research Hypotheses

Direct Hypotheses	
H1	*Attitude toward knowledge sharing will have a positive effect on the individual's intention to share knowledge.*
H2	*Subject norm of knowledge sharing will have a positive effect on the individual's intention to share knowledge.*
H3	*Perceived behavioral control will have a positive effect on the individual's intention to share knowledge.*
H4	*Perceived behavioral control will have a positive effect on the individual's knowledge sharing behavior.*
H5	*Perceived knowledge sharing self-efficacy will have a positive effect on the individual's intention to share knowledge.*
H6	*Perceived knowledge sharing self-efficacy will have a positive effect on the individual's knowledge sharing behavior.*
H7	*Intention to share knowledge will have a positive effect on the individual's knowledge sharing behavior.*
Moderating Hypotheses	
H8a	*The effect of the relationship of attitude on an individual's intention to share knowledge is stronger when the individual is in action verses state orientation.*
H8b	*The effect of the relationship of subject norm on an individual's intention to share knowledge is stronger when the individual is in state verses action orientation.*
H8c	*The effect of the relationship of perceived behavioral control on an individual's intention to share knowledge is stronger when the individual is in action verses state orientation.*
H8d	*The effect of the relationship of perceived behavioral control on an individual's knowledge sharing behavior is stronger when the individual is in action verses state orientation.*
H8e	*The effect of the relationship of perceived knowledge sharing self-efficacy on an individual's intention to share knowledge is stronger when the individual is in action verses state orientation*
H8f	*The effect of the relationship of perceived knowledge sharing self-efficacy on an individual's knowledge sharing behavior is stronger when the individual is in action verses state orientation*
H8g	The effect of the relationship of individual's intention to share knowledge on an individual's knowledge sharing behavior is stronger when the individual is in action verses state orientation.

A nine-item measure of self-efficacy (0%~100%) was developed to capture the respondents' self-efficacy in using SCTNet for KM practices such as using a search engine, posting/answering discussions, and sharing materials in the workshop area. Subjects were asked to judge the level of their capabilities as of when they completed the questionnaire; therefore, items were phrased in terms of "can do" rather than "will do." This reveals the level of *strength* in doing the activity specified in the item. Note that the efficacy scales are unipolar, ranging from 0 ("cannot do") to complete assurance, 100 ("can certainly do"). Such scales can reveal both magnitude (can or cannot do an activity of a certain difficulty) and strength (level of conviction in doing that activity) (Bandura 1995).

Knowledge sharing behavior was measured by aggregating the frequency of two types of knowledge transfer actions: transmission (sending or presenting knowledge to a potential recipient) and absorption by that person or group (Davenport and Prusak 1998). The actions of transmission included posting personal opinions of teaching on SCTNet, uploading teaching materials, giving criticism while uploading, and sharing information through an electronic bulletin board system (BBS), while absorption actions included downloading teaching materials, giving criticism while downloading, and subscribing to electronic news from SCTNet. No qualitative assessment of the knowledge content was performed due to the resource limitations.

The action control construct was measured using a forced-choice self-report measure developed by Kuhl and Bechmänn (1985) to assess action-state orientation. The 24 items, divided into two subscales measuring preoccupation and hesitation, depict brief scenarios that occur in everyday life and require selection of one of two options that indicate what the participant would do.

Data Analysis and Results

Scale Validation

The first step in scale validation is to assess convergent validity. Two different assessments are made for convergent validity: (1) individual item reliability and (2) construct reliability. The *individual item reliability* is assessed by examining the item-to-construct loadings for each construct that is measured with multiple indicators. As shown in Table 2, the multiple indicators of the *individual item reliability* are all greater than 0.7 (Chin 1998). In addition, composite reliability and Cronbach's alpha scores are both used to measure the internal consistency within a given construct's items. Bearden et al. (1993, p. 7) claim that a score of 0.7 indicates *extensive* evidence. In our measurement mode, all of the constructs exhibit composite reliabilities over 0.87, and Cronbach's alpha of 0.91 or higher. Thus, it appears that the internal consistency of the constructs' items have been established satisfactorily. Finally, all of the constructs in our measurement model exceed the established criterion, 0.5, for average variance extracted (AVE) (Fornell and Larker 1981; Hair et al. 1998), meaning that 50 percent or more variance of the indicators is accounted for by their hypothesized constructs (Chin 1988; Hair et al. 1998). Thus, our research constructs have construct reliability.

Second, discriminant validity is evaluated for the measurement scales using each indicator's loading on its own construct as well as its cross-load on all other constructs (see Table 3). The loadings for the indicators for each construct are higher than the cross loadings for other constructs' indicators. Moreover, going across the rows, each indicator has a higher loading with its construct than a cross loading with any other construct. This provides evidence that our research constructs have discriminant validity (Chin 1998).

Table 2. Item-to-Construct Loadings and Construct Reliability

Construct	Item-to-Construct Loading	Composite Reliability	Cronbach's Alpha	Average Variance Extracted (AVE)
Attitude toward knowledge sharing				
A1	0.91	0.95	0.94	0.86
A2	0.92			
A3	0.92			
Subject norm of knowledge sharing				
SN1	0.74	0.87	0.91	0.69
SN2	0.80			
SN3	0.96			
Perceived behavioral control				
PBC1	0.91	0.94	0.93	0.78
PBC2	1.00			
PBC3	0.90			
PBC4	0.77			
Perceived knowledge sharing self efficacy in the site				
SE1	0.96	0.94	0.97	0.85
SE2	0.96			
SE3	0.97			
Knowledge sharing intention				
INT1	0.97	0.95	0.94	0.9
INT2	0.92			

Table 3. Item to Own Construct Correlation vs. Correlations with Other Constructs

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
PBC1	**.879**	.180	.185	.118	.173
PBC2	**.893**	.215	.195	.115	.171
PBC3	**.878**	.252	.106	.107	.151
PBC4	**.752**	.174	.280	.125	7.139E-02
SE1	.187	**.953**	3.407E-02	3.297E-02	8.282E-02
SE2	.248	**.940**	-7.247E-03	1.919E-02	9.150E-02
SE3	.227	**.943**	2.020E-02	3.731E-02	.102
A1	.205	1.712E-02	**.865**	.251	.197
A2	.254	4.279E-02	**.840**	.269	.214
A3	.228	-1.395E-02	**.864**	.221	.208
SN1	.106	6.078E-02	.121	**.912**	.111
SN2	.111	2.486E-03	.239	**.891**	.133
SN3	.165	2.712E-02	.364	**.788**	.171
I1	.213	.126	.337	.202	**.853**
I2	.248	.166	.249	.209	.867
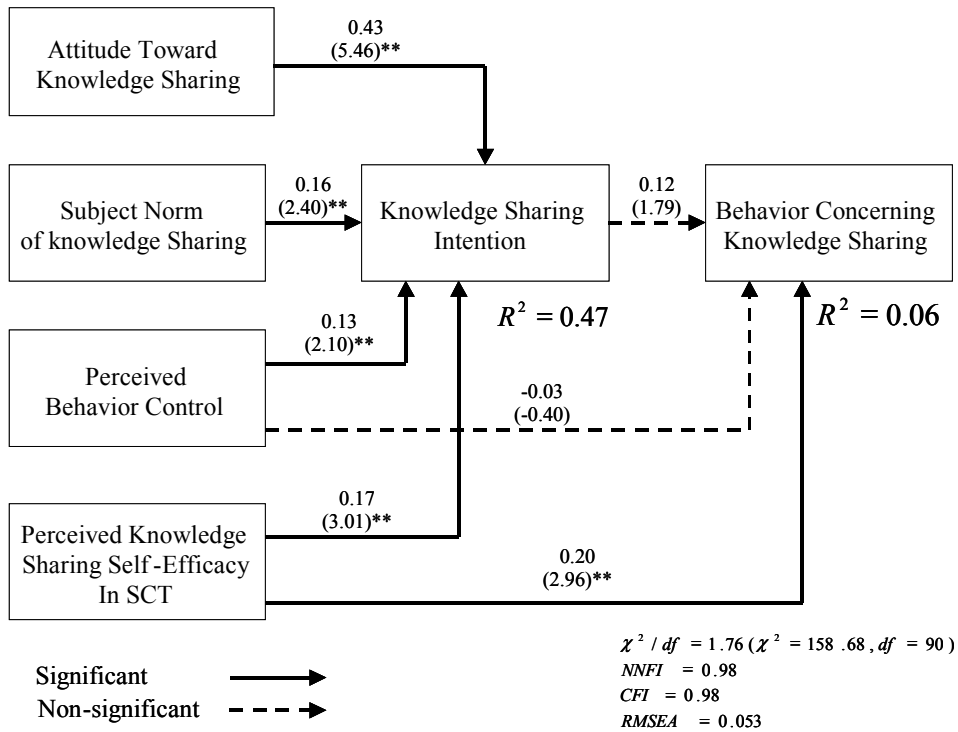
Figure 2. Results of the Model Test

Structural Model

The structural model is evaluated using LISREL version 8.3. For models with good fit, it is suggested that chi-square normalized by degree of freedom (χ^2/df) should not exceed 5 (Bentler and Bonnet 1980), Bentler-Bonnet non-normed fit index (NNFI) and comparative fit index (CFI) should exceed 0.9, and root mean square error of approximation (RMSEA) should not exceed .08. For the current structural model (see Figure 2), χ^2/df was 1.75 (χ^2=158; df=90), NNFI is .98, CFI is .98, and RMSEA is .05, suggesting adequate model fit.

Next, we evaluate the path significance in the research model and the variance explained (R^2 value) by each path is examined. The significance and the relative strength of individual paths specified by the research model are also evaluated. As summarized in Table 4, the paths from attitude, subject norm, perceived behavioral control, and self-efficacy are all significant, as suggested by the p-value begin less than 0.05. The value shows that attitude, subject norm, perceived behavior control, and self-efficacy account for 47 percent of variance in knowledge sharing intention. Furthermore, knowledge sharing intention, perceived behavior control, and perceived knowledge sharing self-efficacy in SCT account for 6 percent of variance in behavior concerning knowledge sharing behaviors (see Figure 2). In summary, perceived knowledge sharing self-efficacy appeared to be a significant determinant of both intention and behavior at $p < .05$. However, the paths from perceived behavioral control to intention and intention to behavior concerning knowledge sharing were statistically insignificant.

Table 4. Significance of Individual Paths

Path	Path coefficient (t-value)		Hypotheses
ATT ➔ Intention	**0.43**	**5.46****	H1 (supported)
SN ➔ Intention	**0.16**	**2.40****	H2 (supported)
PBC ➔ Intention	**0.13**	**2.10****	H3 (supported)
PBC ➔ Behavior	-0.03	-0.40	H4 (not supported)
SE of SCT ➔ Intention	**0.17**	**3.01****	H5 (supported)
SE of SCT ➔ Behavior	**0.20**	**2.96****	H6 (supported)
Intention ➔ Behavior	0.13	1.79	H7 (not supported)

Note: ** p-value < 0.05

The Moderating Effect of Action Versus State Orientation

To test the moderating effect, two stages of data analyzing processes are performed. First, the sample is split into subgroups (i.e., action-oriented and state-oriented groups) and analyzed separately. A MANOVA test shows that the observations are independent, the variance-covariance matrices are equal across these two subgroups, and the set of dependent variables follow a normal distribution.

At the second stage, we find that the path coefficients among the research variables are significant at $p < .01$ levels in both action-oriented and state-oriented samples. A two-group stacked model is used to test whether the individual gamma and beta coefficients are equal between action-oriented and state-oriented groups. Table 5 shows the results of the moderating effects of action control. For the action-oriented group, attitude has a significant effect on knowledge sharing intention ($t = 5.40$, $p < 0.05$) and perceived self-efficacy has a significant effect on knowledge sharing behavior ($t = 2.31$, $p < 0.05$), but the effect of perceived subjective norm on intention is statistically insignificant. Conversely, for the state-oriented group, both attitude and subjective norm have significant effects on intention ($t = 3.16$, $p < 0.05$; $t = 3.29$, $p < 0.05$, respectively). However, the effects of perceived behavior control, perceived self-efficacy, and intention on knowledge sharing behavior are statistically insignificant. Finally, the equality constraint model shows that gamma coefficients (1) between subjective norm of knowledge sharing and knowledge sharing intention ($\Delta\chi^2 = 5.63$, $p < 0.05$), (2) between perceived behavioral control and knowledge sharing behavior ($\Delta\chi^2 = 3.26$, $p < 0.1$), and (3) between self-efficacy and knowledge sharing intention ($\Delta\chi^2 = 4.33$, $p < 0.05$) differ between the action and state-oriented groups. Therefore, hypotheses H8b, H8d, and H8e are supported by the data.

Table 5. The Results of the Moderating Effects of Action Control

	Action-oriented Group		State-oriented Group		χ^2 Difference		
	ß	*t*-value	ß	*t*-value	$\Delta\chi^2$	(p-value)	**Hypotheses**
ATT ➔ Intention	**0.54**	**(4.57)****	**0.32**	**(3.16)****	1.38	0.24	H8a
SN ➔ Intention	0.03	(0.32)	**0.32**	**(3.29)****	5.63	**0.02****	**H8b (support)**
PBC ➔ Intention	0.14	(1.50)	0.11	(1.33)	0.23	0.63	H8c
PBC ➔Behavior	0.09	(0.88)	-0.17	(-1.69)	3.26	**0.07***	**H8d (support)**
SE ➔ Intention	0.09	(1.19)	**0.25**	**(3.21)****	4.33	**0.04****	**H8e (support)**
SE ➔Behavior	**0.22**	**(2.31)****	0.18	(1.82)	0.2	0.65	H8f
Intention ➔ Behavior	0.10	1.03	0.16	(1.54)	0.22	0.64	H8g

$\Delta\chi^2$ = The difference of χ^2 value between the restricted model and the base model.
**p < 0.05, *p < 0.1

Discussion and Conclusion

In this study, we investigated three types of volitional control mechanisms that may impact people's KM practices. Our results show that, in KM, people do not always perform in a manner consistent with their espoused attitudes and intentions. This cognition-behavior inconsistency can be explained by peoples' volitional control mechanisms. Specifically, both perceived self-efficacy (Bandura 1997) and action control (Kuhl and Bechmänn 1985) play a role in motivating individuals to share and use knowledge, while perceived behavioral control does not. Thus, the perceived ease or difficulty of using a KM platform is not critical, confirming many previous findings that IT does not play a central role in successful KM implementation. However, perceived self-efficacy, i.e., one's conviction in his or her ability to conduct KM tasks, is an important factor influencing KM practice directly. In addition, one's action/state orientation moderates his or her enactment of subjective norm and self-efficacy beliefs into intentions as well as his or her enactment of perceived behavioral control belief into behaviors. These results have important theoretical and managerial implication.

Theoretically, our research indicates that the study of KM has to go beyond the investigation of intention, which has been the most-employed dependent variable when applying theories like TRA and TPB. Note that while the construct of perceived behavioral control is shown to be inadequate for measuring one's control beliefs in KM-related behaviors in our study, this inadequacy may be caused by the fact that knowledge-related behaviors are ambiguous and are the perceived behavioral construct. As Ajzen (2001) has pointed out, the more specific the target behavior is, the better the predicting power of the perceived behavioral control construct. Still, other behavior-based theories such as Locke's goal setting theory (Locke and Latham 1990) and Bandura's social cognitive rheory may provide better guidance in KM studies. Future research may be employed to confirm this.

The demonstrated importance of self-efficacy and action control beliefs is worth further discussion. Both types of beliefs are highly reciprocally dependent on the environment. In fact, self-efficacy is the center of social cognitive theory (SCT) (Bandura 1997), which adopts a cognitive interactionist perspective to personal behavior. Within SCT, personal factors in the form of thought and affections, environmental factors like social norm and peer encouragement, and personal behavior all operate as interacting determinants that influence each other bidirectionally (Bandura 1997). A substantial body of research on the diverse effects of self-efficacy has been conducted over the past two decades. The findings suggest that people with a low sense of self-efficacy tend to have low aspirations and weak commitment to pursuing their goals and feeble adherence to their values. Conversely, people of high self-efficacy approach difficult tasks as challenges to be mastered rather than as threats. They quickly recover their efficacy perception from their failures and heighten their efforts in the face of difficulties. Thus, the important tasks for KM researchers are to investigate how the efficacy and action control beliefs can be raised and the possible adverse effect of low efficacy and action control beliefs on a certain KM implementation.

For managers who wish to carry out KM projects, our research confirms the finding of Davenport and Völpel (2001) that "managing knowledge is managing people; managing people is managing knowledge." In fact, people management is probably the oldest problem faced by any manager of any organization. Past research has shown that the beliefs concerning self-efficacy and action/state orientation can be strengthened by positive vicarious observation, encouraging feedback, previous enactive mastery, and appropriate psychological arousal. Managers should, therefore, endow in these general areas if they wish their KM investment to pay off.

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Appendix A

The Measures of This Study

Intention:
- INT1   I will do knowledge sharing on SCTNet
- INT2   I will try to do knowledge sharing on SCTNet

Attitude:
- A1   I think knowledge sharing on SCTNet is good
- A2   I think knowledge sharing on SCTNet is beneficial
- A3   I think knowledge sharing on SCTNet is wise

Subjective Norm:
- SN1   I think my school principal will support me in doing knowledge sharing on SCTNet
- SN2   I think the colleagues in my school will support me in doing knowledge sharing on SCTNet
- SN3   I think my peers in the educational domain will support me in doing knowledge sharing on SCTNet

Perceived Behavioral Control:
- PBC1   For me to use SCTnet is very easy
- PBC2   If I want to, it is very easy for me to use SCTnet
- PBC3   I believe that I have full control over using SCTnet
- PBC4   It is mostly up to me whether or not I use SCTnet

Self-Efficacy:
- SE1   I am confident that I can fill out SCTnet's registration form and complete the registration process
- SE2   I am confident that I can find out all the resource which I want through using SCTNet's search engine
- SE3   I am confident that I can post new issues on SCTNet's Discussion Forum
- SE4   I am confident that I can give responses to a specific issue on SCTNet's Discussion Forum
- SE5   I am confident that I can discuss work related issues on SCTNet's Professional Forum
- SE6   I am confident that I can perform resource sharing on SCTNet's Resource Sharing Forum
- SE7   I am confident that I can have a chat in a specific topic on SCTNet's Coffee Shop
- SE8   I am confident that I can use SCTNet in arranging my personal calendar
- SE9   I am confident that I can use SCTNet's Strategic Alliance to link to other teaching sites

Action Control:

AC1   When I have lost something that is very valuable to me and I can't find it anywhere: (a) I have a hard time concentrating on something else (b) I put it out of my mind after a little while

AC2   If I've worked for weeks on one project and then everything goes completely wrong with the project: (a) It take me a long time to adjust myself to it (b) It bothers me for a while, but then I don't think about it anymore

AC3   When I'm in a competition and have lost every time: (a) I can soon put losing out of my mind (b) The thought that I lost keeps running through my mind

AC4   If I had just bought a new piece of equipment (for example a tape deck) and it accidentally fell on the floor and was damaged beyond repair: (a) I would manage to get over it quickly (b) It would take me a long time to get over it

AC5   If I have to talk to someone about something important and, repeatedly, can't find him or her at home: (a) I can't stop thinking about it, even while I'm doing something else (b) I easily forget about it until I see the person

AC6   When I've bought a lot of stuff at the store and realize when I get home that I've paid too much-but I can't get my money back: (a) I can't usually concentrate on anything else (b) I easily forget about it

AC7   When I am told that my work has been completely unsatisfactory: (a) I don't let it bother me for too long (b) I feel paralyzed

AC8   If I'm stuck in traffic and miss an important appointment: (a) At first, it's difficult for me to start do anything else at all (b) I quickly forget about it and do something else

AC9   When something is very important to me, but I can't seem to get it right: (a) I gradually lose heart (b) I just forget about it and do something else

AC10   When something really gets me down: (a) I have trouble doing anything at all (b) I find it easy to distract myself by doing other things

AC11   When several things go wrong on the same day: (a) I usually don't know how to deal with it. (b) I just keep on going as though nothing had happened

AC12   When I have put all my effort into doing a really good job on something and the whole thing doesn't work out: (a) I don't have too much difficulty starting something else (b) I have trouble doing anything else at all

AC13   When I know I must finish something soon: (a) I have to push myself to get started (b) I find it easy to get it done

AC14   When I don't have anything in particular to do and I am getting bored: (a) I have trouble getting up enough energy to do anything (b) I quickly find something to do

AC15   When I'm getting ready to tackle a difficult problem: (a) It feels like I am facing a big mountain that I don't think I can climb (b) I look for a way that the problem can be approached in a suitable manner

AC16   When I have to solve a difficult problem: (a) I usually don't have a problem getting started on it (b) I have trouble sorting things out in my head so that I can get down to working on the problem

AC17   When I have to make up my mind about what I am going to do when I get some unexpected free time: (a) It takes me a long time to decide what I should do during this free time (b) I can usually decide on something to do without having to think it over very much

AC18   When I've work to do at home: (a) It is often hard for me to get the work done (b) I usually get it done right away

AC19   When I have a lot of important things to do and they must all be done soon: (a) I often don't know where to begin (b) I find it easy to make a plan and stick with it

AC20   When there are two things that I really want to do, but I can't do both of them: (a) I quickly begin one thing and forget about the other thing I couldn't do (b) It's not easy for me to put the other thing I couldn't do out of my mind

AC21   When I have to take care of something important which is also unpleasant: (a) I do it and get it over with (b) It can take a while before I can bring myself to do it

AC22   When I am facing a big project that has to be done: (a) I often spend too long thinking about where I should begin (b) I don't have any problems getting started

AC23   When I have a boring assignment: (a) I usually don't have any problem getting through it (b) I sometimes can't get moving on it

AC24   When I have an obligation to so something that is boring and uninteresting: (a) I do it and get it over with (b) It can take a while before I can bring myself to do it