



To share or not to share: modeling knowledge sharing using exchange ideology as a moderator

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Abstract

Purpose – The purpose of this paper is to propose important determinants of knowledge sharing, including co-worker congruence, received task interdependence, organizational commitment and participative decision-making. Exchange ideology is considered a moderator in this study.

Design/methodology/approach – A two-step procedure of structural equation modeling is applied for data analysis. The moderating effects are simultaneously examined using data from employees across different industries.

Findings – This study suggests the influence of co-worker congruence on knowledge sharing is stronger for individuals with low exchange ideology than for those with high exchange ideology, while the influence of received task interdependence on knowledge sharing is stronger for individuals with high exchange ideology than for those with low exchange ideology. The influence of participative decision-making on knowledge sharing is stronger for individuals with high exchange ideology than for those with low exchange ideology.

Research limitations/implications – The limitations may relate to the possibility of a common method bias and causal ordering between knowledge and its determinants.

Practical implications – Management who wish to increase the incentive to share knowledge should first establish a harmonious atmosphere that fosters interpersonal congruence among employees and encourages employees to work closely together. A culture that arouses employees' organizational commitment and encourages employees to participate in decision-making is most likely to increase willingness to share knowledge. Finally, the implications for moderating effects of exchange ideology are also provided.

Originality/value – This paper clarifies the moderating impacts of exchange ideology and guide management to design a variety of strategies for different staffs and thus obtain successful knowledge sharing in an organization.

Keywords Knowledge sharing, Knowledge management systems

Paper type Research paper

Introduction

Knowledge sharing can be defined as individuals sharing organizationally relevant experiences and information with one another. Although knowledge sharing is neither prescribed nor required in advance for a job, it significantly increases the resources of an organization, and reduces time wasted in trial-and-error. It has been indicated that knowledge sharing is a precious intangible resource that holds the key to competitive advantage (Grant, 1996). Whereas knowledge sharing makes an organization become more competitive in the market, the unwillingness of knowledge sharing causes fatalities for organizational survival. Therefore, predicting the intention to share knowledge has to be seriously recognized as a critical issue to both academia and the business community, and several useful theories for studying such an intention have



been proposed. For example, the intention for knowledge sharing is defined as part of the attitudes toward pro-social organizational behaviors. The pro-social attitudes capture the general propensity of people anticipating good consequences not only for themselves, but also for their co-workers (Brief and Motowidlo, 1986). Social exchanges (Witt *et al.*, 2001) have been also mentioned to be useful in influencing knowledge sharing (Jarvenpaa and Staples, 2001). These theories provide a good foundation for researchers to understand knowledge sharing.

Many organizations have tried utilizing reward systems to encourage employees to share knowledge with their co-workers. However, as suggested by Jarvenpaa and Staples (2001), pro-social behaviors of knowledge sharing are above and beyond those prescribed by job descriptions, are voluntary in nature, and cannot be directly or explicitly rewarded, because of its intangibility (Grant, 1996). Therefore, rather than emphasizing rewards, this research tries another approach, social influences (containing person-to-person influences and organization-to-person influences respectively), that may constrain or support the individual's knowledge sharing in an organization, and also simultaneously use exchange ideology as a moderator. More specifically, in the proposed model of this study the knowledge sharing is simultaneously affected by person-to-person influences comprising co-worker congruence and received task interdependence as well as by organization-to-person influences comprising organizational commitment and participative decision-making.

This work differs from previous studies in two critical points. Firstly, in addition to knowledge sharing established from the social perspective, social influences have also deep roots in social theory (Ibarra and Andrews, 1993; Manev and Stevenson, 2001; Tichy *et al.*, 1979). While knowledge sharing and social influences are both associated with the social theory, there has been little attention on the relationships among them. Consequently, this study is the first to seek to enhance the understanding of the perceptual antecedents of knowledge sharing by investigating the social influences (co-worker congruence, organizational commitment, received task interdependence, and participative decision-making). Secondly, exchange ideology is assessed as a critical moderator during the formation of knowledge sharing. Even though exchange ideology is an important variable in the context of social interactions (e.g. Witt, 1991a, b) and knowledge sharing (e.g. Chua, 2003) respectively, it has been rarely studied under an issue jointly merging both areas as a whole. If exchange ideology indeed moderates the relationships between knowledge sharing and its antecedents, then the failure to test and report for differences across different levels of exchange ideology may have obscured an important issue. To sum up, specifying the moderating impacts of exchange ideology can guide management to design a variety of strategies for different staffs and thus obtain better knowledge sharing in an organization.

Hypotheses development

Previous literature has defined congruence as fit or similarity (Angeles and Nath, 2001). It is proposed that congruency should be encouraged among people and resources in both formal and informal organizations, in order to ensure internal effectiveness and achieve their common goals (Nadler *et al.*, 1992). Co-worker congruence denotes a matching of an individual to his or her co-workers, and it also refers to the homogeneity of the characteristics of people; that is, interpersonal similarity (Van Vianen, 2000). Previous theories suggest that people are looking for

consensual validation of their opinions and abilities and seek to maximize consistency among the elements of their belief system (Byrne, 1971; Lott and Lott, 1965; Van Vianen, 2000). Congruence in perceptions among co-workers is a valuable concept in the more mature stage of maintaining a good relationship (Angeles and Nath, 2001). Individuals thus will be more attracted to co-workers who are more closely concerned about their opinions, values, and goals, which in turn will enhance their willingness of exchanging experiences, affection, and knowledge with their co-workers, leading to greater knowledge sharing. The hypotheses can be summarized as follows:

H1. Co-worker congruence positively influences knowledge sharing.

Defined as an attachment to or identification with the organization (Mathieu and Zajac, 1990), (affective) organizational commitment continues to receive attention from both researchers and practitioners. One of the main uses of the concept of organizational commitment derives from its relationship with its critical organizational consequences, such as job performance, turnover intentions, etc. More specifically, organizational commitment has been examined to influence job performance, with highly-committed employees performing better than less committed ones. Therefore, it is reasonable that an individual with higher organizational commitment is more likely to react with stronger knowledge sharing, given that knowledge sharing improves the facilitation of group performance. Moreover, organizational commitment can also be seen as an emotional response to a positive appraisal of the work environment (Testa, 2001). Such an emotional response may be considered an attachment, particularly when the individual believes strongly in the organization's values and goals.

Organizational commitment not only indicates the relative strength of individual identification with an involvement in a particular organization (Mowday *et al.*, 1979), but also is assumed to influence almost all behavior that benefits the organization including knowledge sharing given that knowledge sharing is a way of facilitating the pursuit of organizational goals. Restated, the identification with the organization implies supporting its goals, which are achievable with knowledge sharing. Thus, employees who feel attached to and identify with their organization's work are assumed to collaborate better with co-workers by sharing knowledge comprising information, experience, and so on. Consequently, employees with higher organizational commitment expend greater efforts on group work, and thus have stronger knowledge sharing. Therefore, the following hypothesis is proposed:

H2. Organizational commitment positively influences knowledge sharing.

Interdependence among team members is a phenomenon with motivating potential (Van der Vegt *et al.*, 1998). Although task and outcome interdependence are both important in affecting different aspects of group functioning, task interdependence is more critical to knowledge sharing given that task interdependence influences more highly on variables related to cooperation (Wageman, 1995). Knowledge sharing is such a variable related to cooperation. Furthermore, for task interdependence, received task interdependence rather than other task interdependence is considered herein given that received task is highly correlated with other task interdependence, for example, initiated task interdependence. More specifically, it was found that changes in received task interdependence could lead to corresponding changes in other task interdependence (Kiggundu, 1981). Consequently, received task interdependence is

appropriately taken into serious consideration during the formation of knowledge sharing.

Team members who require co-workers to offer information and supplies to complete their work can be considered as receiving task interdependence. Received task interdependence is regarded as the interconnections between tasks such that the performance of one definite piece of work counts on the completion of other definite pieces of work (Van der Vegt *et al.*, 1998). Accordingly, it can be defined at the individual level as the extent to which a member in a particular job is affected by the work-flow from one or more other jobs (Van der Vegt *et al.*, 1998). From the perspective of social psychology, individuals working under circumstances of received task interdependence are more open-minded in executing sharing and helping (e.g. assembly line workers who help each other are more task interdependent than those who do not) (Wageman, 1995), and more concerned about each other's task performance, leading to stronger intentions of knowledge sharing. More specifically, when a positive received task interdependence predominates, an individual who benefits from the sound task performances of other group members is more likely to emerge with stronger knowledge sharing, since knowledge sharing facilitating the transfer of physical, informational, or financial resources in a group may lead to better a co-worker's task performance that eventually benefits himself in the end. Based on the above literature review, the hypotheses can be derived as follows:

H3. Received task interdependence positively influences knowledge sharing.

Participative decision-making is regarded by the involvement of employees in the decisions that are the responsibility or authority of a supervisor. Participative decision-making produces intrinsic benefits for employees (Kearney and Hays, 1994) and increases the likelihood of constructing and maintaining mutual benefits in a group, leading to stronger knowledge sharing with co-workers. Indeed, given that participative decision-making partially reflects a working climate in cohesion, if individuals perceive their working climate to be high in cohesion during decision-making, then they may feel comfortable to exchange experiences and knowledge with co-workers, leading to strong knowledge sharing in a group. On the other hand, if employees feel the decision-making is out of their control in the organization, then they would be discouraged to share constructive suggestions and knowledge that help make better decisions, consequently leading to low knowledge sharing in the end. Accordingly, given that assimilation of an organization's goals increases job satisfaction among co-workers, enhanced communication from participative decision-making increases the assimilation of goals among individuals and their co-workers (Witt, 1992), leading to strong knowledge sharing among co-workers. Thus, the hypothesis is stated as follows:

H4. Participative decision-making positively influences knowledge sharing.

Exchange ideology as a moderator

Exchange ideology is a dispositional orientation that refers to the relationship between what individuals give to and receive from an organization (Witt and Wilson, 1990). Whereas some employees share with other organizational members without regard to what they receive from the organization (Witt, 1991a), others may be sensitive with the

exchange ideology and share with other organizational members no more than what the organization does for them (Witt, 1991b). Additionally, exchange ideology refers to a pre-existing general belief system that an individual brings something to an exchange relationship (Sinclair and Tetric, 1995). Following previous research (Witt and Broach, 1993), this study considers exchange ideology as a reflection of an individual expectation for person-organization exchange. Exchange ideology also concerns the relationships of individuals with other entities, including their professional associations and work groups (Redman and Snape, 2005). This perspective is supported by Ladd and Henry (2000), who reported that exchange ideology influences the relationship between perceived organizational support and organizational citizenship behaviors, and thus helps moderate the sharing or helping behaviors of organizational members.

Previous studies have confirmed the impact of perceptions of an organization, and reactions to it, on the development of other job attitudes and behaviors, may be related to exchange ideology (Witt, 1992). The relationship between perceived organizational support and absenteeism has been revealed to be greater for school teachers with a strong exchange ideology than those with a weak ideology (Eisenberger *et al.*, 1986). Subsequent studies have also indicated that exchange ideology has a similar moderating effect on the relationship between certain organizational factors and the obligation on employees to care about the welfare of the organization and to help it reach its objectives (Eisenberger *et al.*, 2001). Although the moderating effects of exchange ideology on the relationships considered in this study had not been previously confirmed, they are worth examining, because whether an increased effort-outcome expectancy in an individual leads to a rise in work effort and favorable job attitudes seems to depend on having an exchange ideology favoring the trade of work effort for material and symbolic benefits (Eisenberger *et al.*, 1986).

Although the relationships of exchange ideology with co-worker congruence and with (affective) organizational commitment have the rarely been discussed (but see Witt *et al.*, 2001), they deserve further attention due to potential interactions among these factors. Exchange ideology is a dispositional orientation, referring to affective expectations about what individuals have received within an organization and what they should give others in the organization in return (Eisenberger *et al.*, 1986). Organizational commitment, or co-worker congruence, is the extent to which individuals trustfully consider themselves as members of an organization or group, and are willing to share knowledge beyond the group's normal expectations (Mathieu and Zajac, 1990). These three factors have similar affective features, so the dispositional impact of exchange ideology on knowledge sharing may be somewhat alleviated by both organizational commitment and co-worker congruence, which are built from an affective perspective between individuals and their organization and between individuals and their co-workers.

For example, given that a company expects organizational commitment or co-worker congruence to affect knowledge sharing, individuals with low exchange ideology may further amplify the effects because they are less concerned about the effects of sharing knowledge than those with high exchange ideology (Witt *et al.*, 2001). Conversely, individuals with high exchange ideology are very concerned about when or what to share with others (Eisenberger *et al.*, 2001), and therefore may still practice

limited knowledge sharing carefully, even if they perceive quite strong co-worker congruence or organizational commitment.

Additionally, individuals with low exchange ideology are not primarily motivated by self-interest (being paid or treated by the organization) (Witt, 1992), and therefore may be more strongly influenced by co-worker congruence and organizational commitment on knowledge sharing than individuals with high exchange ideology. By contrast, individuals with high exchange ideology may decide not to share knowledge even in the case of strong organizational commitment or co-worker congruence, due to perceived lack of personal benefit. This phenomenon occurs because their knowledge sharing behavior is dominated by their strong exchange ideology. The following hypotheses are derived from the above findings:

H1a. The influence of co-worker congruence on knowledge sharing is stronger for individuals with low exchange ideology than for those with high exchange ideology.

H2a. The influence of organizational commitment on knowledge sharing is stronger for individuals with low exchange ideology than for those with high exchange ideology.

Individuals with high exchange ideology are more practical and sensitive to the received task interdependence and participative decision-making highly, since they perceive these factors with extrinsic exchanges as domains for sharing activities. Thus, the received task interdependence and participative decision-making affect knowledge sharing more strongly among individuals with strong exchange ideology than among those with weak exchange ideology, because individuals with strong exchange ideology tend to calculate carefully the balance between what they give to and receive from the organization (e.g. via knowledge sharing that ultimately helps the organization), and only give according to the amount received (Wang, 1999).

When received task interdependence predominates, individuals who receive great organizational rewards due to their co-workers' performance are likely to share knowledge actively, since they believe that the balanced calculation between received rewards and given knowledge helps them in the long run. Similarly, individuals with strong exchange ideology may attempt to balance any perceived participative injustice in decision-making (which is likely to influence their status and interest in the organization). In other words, individuals with a strong sensitivity to reciprocity may reassess knowledge sharing intentions in view of participative injustice. Empirical evidence has also suggested that exchange ideology moderates relationships between individuals' perceptions of the environment and their behavior (Witt *et al.*, 2001). Hence, exchange ideology helps explain the variance employee responses to the participative decision-making environment, given that it reflects an individual's expectation for person-organization exchange (Ladd and Henry, 2000; Witt, 1992). Individuals with strong exchange ideology are more sensitive than those with weak exchange ideology towards participative decision-making with an organization (Sinclair and Tetrick, 1995).

In summary, participative decision-making can help employees guard their own interests when some policies or plans are established or modified. Considering that high exchange ideology reveals stronger orientation of retribution, helping others by sharing knowledge is of no benefit if the opportunities for participative

decision-making for individuals with high exchange ideology are removed, since it suggests that their own benefits may be decreased in the near future. By contrast, individuals with weak exchange ideology are likely to be less influenced by the decision-making protocol, since the work environment may not play an important role in determining their work behaviors (Witt *et al.*, 2001). Thus, individuals with a weak exchange ideology may not vary their knowledge sharing in response to variations in their perceptions of participative decision-making. From the above findings, the following hypotheses are derived and summarized as follows:

- H3a.* The influence of received task interdependence on knowledge sharing is stronger for individuals with high exchange ideology than for those with low exchange ideology.
- H4a.* The influence of participative decision-making on knowledge sharing is stronger for individuals with high exchange ideology than for those with low exchange ideology.

Method

Sample

Although the subjects in this study were MIS students for the pursuit of advance study at a well-known evening college in Taiwan, they work as MIS-related professionals in a variety of industries during the daytime. Using MIS students with work experience, rather than those without work experience, helps facilitate improved external validity. Moreover, the issue of knowledge sharing is important and critically related to MIS issues, which are quite a familiar issue to the sample group. This issue has been discussed in previous research on the unique characteristics of cross-fertilization of knowledge of MIS and its reference disciplines (Westin *et al.*, 1994). Knowledge sharing by MIS professionals is now being increasingly studied, since MIS and its related disciplines have not often been modeled from a perspective of knowledge sharing (Westin *et al.*, 1994). Specifically, many information technologies related to MIS applications have been used to facilitate collaborative work in multi-user settings such as video conferencing, group decision support systems and project management applications, suggesting that knowledge and solutions are being shared, exchanged and applied (Goodman and Darr, 2998). In the survey of this study, four hundred questionnaires were distributed, and 318 usable questionnaires were collected by the researchers (response rate of 80 percent). Two groups are further identified by exchange ideology according to the sample median on their perception of exchange ideology. Table I lists the characteristics of the sample.

Measures

The constructs studied herein are measured using five-point Likert scales drawn and modified from the existing literature, and three steps are utilized to choose items for the scale in this study. To begin with, the scale items from the existing literature are translated into Chinese. Furthermore, two university professors familiar with knowledge sharing were invited to provide assistance in examining the appropriateness of the Chinese version of the scale, translated from the original English literature. Moreover, the measurements were repeatedly modified via pretests. Finally, a back-translation recommended by Reynolds *et al.* (1993) was employed in

Table I.
Characteristics of the
sample

Characteristic		High ($n_1 = 128$)		Low ($n_2 = 190$)		Total ($n = 318$)	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender	Male	72	56	93	49	165	52
	Female	56	44	97	51	153	48
Age	20-29	84	66	135	71	219	69
	30-39	42	33	46	24	88	28
	40 or above	2	1	9	5	11	3
	1 year or less	35	27	74	39	109	34
Tenure	2-5 years	69	54	80	42	149	47
	6-10 years	18	14	28	15	46	14
	11 years or more	6	5	8	4	14	5
Occupation	Manufacturing industry	48	38	78	41	126	40
	Banking	7	5	13	7	20	6
	Service industry	61	47	85	45	146	46
	Others	12	9	14	7	26	8

composing a Chinese version questionnaire. The utilization of the back-translation procedure was a consideration for limiting translation biases. The above process can achieve the content validity of the questionnaire.

Knowledge sharing with five items is drawn from Bock and Kim (2002). The example items included: "I share my knowledge with other co-workers in an effective way," and "I share my knowledge to any co-worker if it is helpful to the organization." Co-worker congruence with four items is modified from Netemeyer *et al.* (1997) and Van Vianen (2000). The example items included: "I feel that my personal preferences are a good fit with co-workers," and "my co-workers have the same inclinations as I do with regards to concern for others." Organizational commitment (affective organizational commitment) with four items is modified from Mowday *et al.* (1979). The example items included: "I talk up this organization to my friends as a great organization to work for," and "I feel loyalty to this organization." Received task interdependence with four items is modified from Van der Vegt *et al.* (1998). The example items included: "I depend on my co-workers for information and advice," and "I depend on the help and support of my co-workers." Participative decision-making with five items is modified from Siegel and Ruh (1973). The example items included: "In my company, I often participate in discussions related to my job," and "In my company, I have a high degree of influence in the decisions affecting me." Finally, exchange ideology was assessed by the five-item measure of Eisenberger *et al.* (1986). The example items included: "an employee's work effort should depend partly on how well the organization deals with his or her desires and concern," and "an employee who is treated badly by the organization should lower his or her work effort."

Measurement model

A two-step procedure (Anderson and Gerbing, 1988) of structural equation modeling (SEM) is applied to conduct data analysis after data collection. After repeated filtering for measurement model testing, every construct in the measurement model is measured using at least two indicator variables as in Table II. The overall goodness-of-fit indices

Construct	Indicators	Standardized loading	Cronbach's α
Knowledge sharing (F1)	V1	0.84 (t = 18.00)	0.89
	V4	0.86 (t = 18.69)	
	V5	0.88 (t = 19.13)	
Co-worker congruence (F2)	V6	0.86 (t = 17.51)	0.84
	V7	0.78 (t = 15.20)	
	V8	0.75 (t = 14.64)	
Organizational commitment (F3)	V14	0.68 (t = 11.25)	0.71
	V15	0.69 (t = 11.56)	
	V16	0.63 (t = 10.53)	
Received task interdependence (F4)	V10	0.82 (t = 15.81)	0.81
	V12	0.77 (t = 14.65)	
	V13	0.71 (t = 13.16)	
Participative decision-making (F5)	V18	0.75 (t = 15.15)	0.87
	V19	0.83 (t = 17.49)	
	V20	0.92 (t = 20.38)	
Goodness-of-fit indices		<i>n</i> = 318 $\chi^2_{80} = 176.97$ p-value = 0.0001 NFI = 0.93 NNFI = 0.95 CFI = 0.96 AGFI = 0.90 GFI = 0.93 RMR = 0.03	

Table II.
Standardized loadings and reliability (*n* = 318)

shown in Table II (chi-square/df smaller than 3.0, RMR smaller than 0.05, CFI, NNFI, GFI, and AGFI greater than 0.9 except that *p*-value is significant) indicate that the fit of the model is satisfactory. Once again in Table II, reliabilities for all constructs exceed 0.7, satisfying the general requirement of reliability for research instruments.

Convergent validity is achieved if different indicators used to measure the same construct obtain strongly-correlated scores. In this study all factor loadings for indicators measuring the same construct are statistically significant (see Table II). This shows that all indicators effectively measure their corresponding construct and support convergent validity (Anderson and Gerbing, 1988).

Discriminant validity is achieved if the correlations between different constructs, as measured with their respective indicators, are relatively weak. The chi-square difference test can be used to assess the discriminant validity of two constructs by calculating the difference of the chi-square statistics for the constrained and unconstrained measurement models. The unique and critical advantage of the chi-square difference test is that it allows for simultaneous pair-wise comparisons (based on the Bonferroni method) for the constructs. The constrained model is identical to the unconstrained model, in which all constructs are allowed to co-vary, except that the correlation between the two constructs of interest is fixed at 1. Discriminant validity is demonstrated if the chi-square difference (with 1 df) is significant, meaning that the model in which the two constructs are viewed as distinct (but correlated) factors is superior. Since we need to test the discriminant validity for every pair of five constructs, we should control the experiment-wise error rate (the overall significance

level). By using the Bonferroni method under the overall 0.01 levels, the critical value of the chi-square test is $\chi^2(1, 0.01/10) = 10.83$. Since the chi-square difference statistics for every two constructs all exceed 10.83 for the model (see Table III), discriminant validity is successfully achieved.

Harman's (1967) one-factor test is used to further check the possibility of a common method variance via the approach outlined by previous literature (Mattila and Enz, 2002; Podsakoff *et al.*, 1984; Schriesheim, 1979). All self-reported variables should be input into a principal components factor analysis with varimax rotation. The common method variance is present in a case where a single factor is yielded from the factor analysis or one "general" factor accounts for more than 50 percent of the covariation in the variables. In this study the analysis indicates a structure in which each factor accounting for less than 50 percent of the covariation, suggesting a little chance of having common method problems. This analysis does not completely rule out the possibility of common method bias, as it indeed provides post hoc statistical support for the absence of such bias in this paper's findings.

Gender as a control variable

The basis of sex differences in thinking and behavior suggests why some underlying gender influences during the formation of knowledge sharing may exist. Treated as a personal characteristic, gender may influence employees' perceptions of the workplace and their attitudinal reactions to the organization (Mathieu and Zajac, 1990). For example, gender may affect whether individuals connect themselves with co-workers or an organization that offers various kinds of support and opportunities (Scandura and Lankau, 1997). Therefore, it is likely that gender acts as a potential factor having some uncertain impacts during the formation for knowledge sharing. To avoid making improper inferences, gender is included as a control variable using the application of a dummy variable in this study to reduce experimental errors.

Structural model

Following the first step of measurement model testing, the second step analyzing the structural models is now performed. Table IV lists the test results for the structural model, indicating that all paths are significant. Dividing the sample by the exchange

Construct pair	Unconstrained χ^2 (df = 80) = 176.97	
	Constrained χ^2 (df = 81)	χ^2 difference
(F1, F2)	460.91	283.94*
(F1, F3)	284.53	107.56*
(F1, F4)	384.75	207.78*
(F1, F5)	430.10	253.13*
(F2, F3)	339.64	162.67*
(F2, F4)	475.62	298.65*
(F2, F5)	475.44	298.47*
(F3, F4)	321.36	144.39*
(F3, F5)	305.96	128.99*
(F4, F5)	405.50	228.53*

Table III.
Chi-square difference tests for discriminant validity ($n = 318$)

Note: * $p < 0.01$ by using the Bonferroni method

ideology into two different groups (high versus low) according to the sample median, further investigations across groups for subgroup analysis are performed respectively as the following.

Subgroup analysis (Byrne, 2001; Singh, 1995) is now performed herein to examine the existence of the moderating effects on the structural model. First, an “unconstrained” model is estimated, in which path coefficients are allowed to vary across the cross-group datasets. Next, a “fully constrained” model is estimated by requiring that all path coefficients are constrained to be equal for cross-group datasets. The “fully constrained” model is thus based on the notion of cross-group variance in model relationships. Comparing the goodness-of-fit statistics for the “unconstrained” and “fully constrained” models using a χ^2 difference test yields evidence for examining our hypotheses. The χ^2 statistics for the unconstrained and fully constrained models are 296.94 (df = 180) and 308.79 (df = 184), respectively. Their difference is 11.85, with 4 degrees of freedom. The significant difference (at the 5 percent level) indicates that moderating effects do exist.

The χ^2 difference test is used again to test for the moderating effects of individual paths. However, the χ^2 statistics for the unconstrained and the “partially constrained” models are compared herein. “Partially constrained” means that only the target path coefficients are set to be equal for cross-group datasets. The results to detect the moderating effects of exchange ideology along with path coefficients are listed in Table V.

Although SEM provides several advantages over regression, the above investigation of moderating effects via a sample-split approach may show a disadvantage of information loss in the moderator variable and does not allow for a

Hypothesis	Standardized coefficient	<i>t</i> value
<i>H1</i>	0.24*	4.33
<i>H2</i>	0.26*	4.09
<i>H3</i>	0.25*	4.37
<i>H4</i>	0.34*	5.14

Table IV.
Path coefficients and *t* value based on total sample

Note: The effects of gender (the control variable) are insignificant; **p* < 0.01

Hypothesis	High (<i>n</i> ₁ = 128) Standardized coefficient	Low (<i>n</i> ₁ = 190) Standardized coefficient	Subgroup comparison (unconstrained) χ^2 (180) = 296.94		Results
			Constrained χ^2 (181)	χ^2 difference	
<i>H1a</i>	0.14*	0.38***	301.19	4.25**	H < L
<i>H2a</i>	0.23***	0.33***	297.35	0.41	H = L
<i>H3a</i>	0.32***	0.15*	300.12	3.18*	H > L
<i>H4a</i>	0.32***	0.20**	302.26	5.32**	H > L

Table V.
Path coefficients and *t* value across high exchange and low exchange ideology

Notes: H = High exchange ideology; L = Low exchange ideology; **p* < 0.10, ***p* < 0.05, ****p* < 0.01

plotting of the moderation relationships. Therefore, this study performs a hierarchical moderated regression again for further confirmation on moderating effects as shown in the Appendices. The results through the approach of SEM and the regression come to the same conclusion.

Results

Based on the entire sample (see Table IV), four paths are all significant (*H1*, *H2*, *H3*, and *H4* are supported). Regarding the moderating effects of exchange ideology in Table V, the influence of co-worker congruence on knowledge sharing is stronger for individuals with low exchange ideology than for those with high exchange ideology (*H1a* is supported), while the influence of organizational commitment on knowledge sharing is similar across both groups (*H2a* is not supported). At the same time, the influence of received task interdependence on knowledge sharing is stronger for individuals with high exchange ideology than for those with low exchange ideology (*H3a* is supported). Finally, the influence of participative decision-making on knowledge sharing is stronger for individuals with high exchange ideology than for those with low exchange ideology (*H4a* is supported). The failure for unsupported hypotheses is interesting and may arise, because such a path is not specific to exchange ideology. The similar influence of organizational commitment on knowledge sharing across individuals with high exchange and low exchange might suggest that perhaps the link from organizational commitment to knowledge sharing is more fundamental rather than contingent. However, in order not to overstate the phenomenon, the unexpected results for unsupported hypotheses may warrant further study.

Discussion and managerial implications

This study posits that four antecedents, namely co-worker congruence, organizational commitment, received task interdependence and participative decision-making, significantly influence on knowledge sharing, while the exchange ideology moderates three of the four proposed model paths in this study. Low knowledge sharing may be attributed to a lack of understanding of its antecedents. Therefore, managers who wish to increase the incentive to share knowledge should first establish a harmonious atmosphere that fosters interpersonal congruence among employees and encourages employees to work closely together. Accordingly, managers should also re-examine their organizational culture, because a culture that arouses employees' organizational commitment and encourages employees to participate in decision-making is most likely to increase willingness to share knowledge. This finding is particularly important when managing teams requiring an involved collaborative posture within small windows of time, since collaborative efforts could involve significant person-to-person and organization-to-person interactions and influences, as described by the four antecedents presented in this study. The teamwork that requires significant collaborative effort is likely to fail if the four antecedents are not considered carefully.

The findings of this study are important to business managers in general, but especially to MIS managers, who need to integrate information technology management into the various departments and functions of an organization (Henderson and Venkatraman, 1993) by encouraging MIS professionals and their

co-workers to share knowledge. The MIS group's ability to share knowledge effectively with diverse functional groups in an organization can significantly affect the performance of both MIS and the organization in general (Nelson and Coopriider, 1996), because mutual knowledge bases between MIS groups and other functional groups can help improve organizational productivity, particularly for MIS groups and their line groups (Nelson and Coopriider, 1996). Efficient knowledge sharing removed barriers to understanding and acceptance between MIS professionals and their teams, raising their ability to work toward a common goal (Nelson and Coopriider, 1996).

In addition to the significant support for the influences of four antecedents on knowledge sharing, further implications for moderating effects of exchange ideology are also provided as the following.

The influence of co-worker congruence on knowledge sharing being stronger for individuals with low exchange ideology than for those with higher exchange ideology indicates that the perception of co-worker congruence for individuals with low exchange ideology is more critical to knowledge sharing. This finding is interesting, and it also encourages a more detailed investigation into the role of exchange ideology in work groups. Specifically, when forming different groups or teams in the organization, management can use the selective congruence concept for evaluating employees to reduce potential conflict among co-workers in a team. The strategy is particularly advantageous in circumstances where there are multiple solutions (alternatives) for forming different groups or teams. Specifically, team knowledge sharing will be repressed much more if an individual with low exchange ideology is assigned to a team in which he or she cannot fit in well due to dramatic heterogeneity of characteristics of people and interpersonal dissimilarity. This finding is partially consistent with the previous research indicating that interpersonal congruence offers a possible basis for effective teams (Tett and Murphy, 2002). From an academic perspective, co-worker congruence under different levels of exchange ideology is valuable in constructing theory about the nature of team structures and coordinative mechanism that are needed to support interpersonal social systems in business management.

A similar influence of organizational commitment on knowledge sharing for individuals with high and low exchange ideology suggests that organizational commitment is important and enduring to knowledge sharing, regardless of the exchange ideology. There is no doubt that management should be aware that knowledge sharing is in a potentially vulnerable situation if they are unwilling to invest in establishing fundamentally the employee identification to boost stronger organizational commitment. Moreover, it is also useful for management to approach employees individually and communicate the organizational vision with them, and such underlying communication to each employee consequently strengthens the organizational commitment.

The influence of received task interdependence on knowledge sharing is stronger for individuals with high exchange ideology than for those with low exchange ideology, implying that individuals with high exchange ideology are more sensitive to such an influence, and they will display greater knowledge sharing as soon as perceiving the coexistence for the future achievement of teamwork with other co-workers. Of course, it would be inaccurate to say that received task interdependence is unimportant for individuals with low exchange ideology concerning knowledge

sharing. However, research on the stereotypes of exchange ideology has discussed that being strongly mindful of ideal exchange violates the role norms of low exchange ideology, and therefore the knowledge sharing for individuals with low exchange ideology may be less influenced by received task interdependence in comparison with individuals with high exchange ideology. In other words, management should prioritize the exchange ideology as an important indicator when redesigning the content of individual tasks and assigning jobs designed as mutually interdependent specifically to employees with high exchange ideology, since the impact of received task interdependence is more sensitive among them to influence knowledge sharing. Should management fail to sketch clearly interdependent tasks to individuals with high exchange ideology, they might react with low intentions of knowledge sharing in the long run. After all, outstanding functioning work teams in which individuals experience positive received task interdependence can be successfully achieved by reshaping the social interdependence structure.

The influence of participative decision-making on knowledge sharing is stronger for individuals with high exchange ideology than for those with low exchange ideology, implying that individuals with high exchange ideology are more sensitive to such an influence, and they display greater knowledge sharing when they can be better involved with decision-making. On the other hand, for employees with a weak exchange ideology, the participative decision-making may be considerably less important. Due to the stereotype of high exchange ideology reflecting a stronger tendency of utilitarianism, individuals with high exchange ideology will feel depressed for being unable to participate in the decision-making especially when the decisions have a lot to do with their own benefit and interest. Consequently, management should take the recommendations of individuals with high exchange ideology as a priority to consider when making decisions. Accordingly, management must establish formal mechanisms for a participative channel especially for individuals with high exchange ideology, providing them the opportunity to express their constructive opinions during the decision-making process. The procedural barriers to participative decision-making must be taken down, and it means a lot for individuals with high exchange ideology. For instance, mechanisms such as internet “hotlines” and “response mailboxes” are likely to encourage individuals to express their own opinions. At any rate, offering various participative channels should more significantly encourage individuals with high exchange ideology to be a part of the decision makers, and consequently effectively achieve knowledge sharing via strengthened participative decision-making.

One last implication in this research is that no single practice is superior to another in managing better knowledge sharing without considering the individual exchange ideology. To efficiently accomplish knowledge sharing, management should employ different supervisory styles in providing feedback and support to their personnel with regards to their exchange ideology. All the staffs should be administered a standard battery of investigations for exchange ideology periodically. Consequently, the management can filter out different levels of exchange ideology and then achieve knowledge sharing by manipulating the sensitively counter antecedents.

Limitations

This study suffers from several limitations that relate to measurement and interpretation of results. First, this study in regards to knowledge sharing has in fact measured subjects' intention rather than actual behavior. However, one's intention is not necessarily the most perfect predictor of behavior (Roizen *et al.*, 2001). The second limitation is the possibility of a common method bias in this study. This study used a single questionnaire to measure all constructs, which may inflate the strength of the relationships among these constructs. The third limitation may relate to causal ordering between knowledge and its antecedents. Specifically, while knowledge sharing is affected by the four proposed variables in this study, it may itself affect the four variables under particular circumstances. For example, given that received task interdependence relates to the work relationships between individuals and their co-workers, frequent knowledge sharing on job details may efficiently facilitate mutual understanding and improve relationships among team members, leading to strong perceptions of received task interdependence. The fourth issue is the cross-sectional design employed. Longitudinal studies support stronger inferences and may be useful in addressing issues of causation. Therefore, the model developed and validated herein could benefit from being tested from a longitudinal design. Future studies can try to improve such shortcomings by directly observing the subjects over time and exploring other potentially important variables. The genuine relationships of knowledge sharing can then be more transparently revealed.

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Appendix 1

	Model 1	Model 2
Variable	β	β
Gender	0.00	0.02
Exchange ideology	-0.07	-0.59
Co-worker congruence	0.18***	0.87***
Organizational commitment	0.18***	0.17
Received task interdependence	0.22***	-0.25
Participative decision-making	0.32***	-0.33
<i>Interactions</i>		
EI \times co-worker congruence		-0.18**
EI \times organizational commitment		0.00
EI \times received task interdependence		0.13**
EI \times participative decision-making		0.17**
Adj. R^2	0.49	0.51

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table A1.
Results of hierarchical moderated regression

Appendix 2

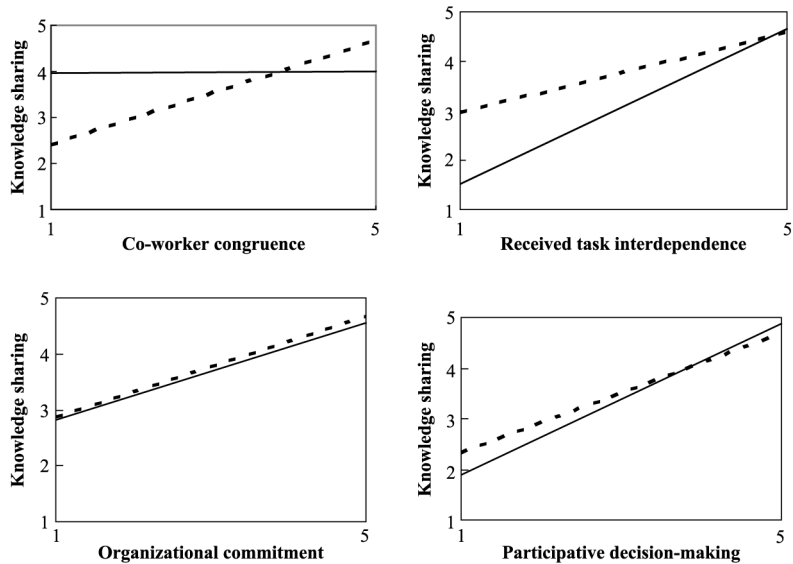


Figure A1.
Knowledge sharing scores regressed on respective proposed antecedent scores

Key: - - - Weak exchange ideology; — High exchange ideology

Notes: Low exchange ideology score = 1 standard deviation below the mean; high exchange ideology score = 1 standard deviation above the mean

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