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Knowledge sharing and affective commitment: the mediating role of psychological ownership

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Abstract

Purpose – *The purpose of this paper is to investigate the meditating role of psychological ownership which includes both organisation-based psychological ownership (OPO) and knowledge-based psychological ownership (KPO) on the relationship between affective commitment and knowledge sharing.*

Design/methodology/approach – *This paper is an empirical study based on structural equation modelling, with a sample of 293 employees from 31 high-technology firms in China.*

Findings – *The result indicated that affective commitment had a significant positive effect on OPO but no effect on KPO; OPO was positively related to both common and key knowledge sharing, while KPO exerted a negative impact on both; common knowledge sharing was positively related to key knowledge sharing; the relationship between affective commitment and key knowledge sharing was multi-mediated by OPO and common knowledge sharing.*

Originality/value – *OPO and KPO play an essential role in transferring the effect of employees' affective commitment to common knowledge sharing and key knowledge sharing, which unravels the blackbox of how effective commitment affects knowledge sharing.*

Keywords Innovation, Knowledge sharing, Knowledge management, Human resource management

Paper type Research paper

1. Introduction

Knowledge sharing has been well documented as a vital way for firms to develop skills and competences to stay competitive (Grant, 1996; Spender, 1996; Liu and Liu, 2011; Ramirez and Li, 2009). It is a prerequisite for innovation, as ideas or concepts rely on effective knowledge sharing among employees to be converted and applied at the organisational level for the development of new products, services and processes (Nonaka and Takeuchi, 1996; Nonaka *et al.*, 2006). Nevertheless, knowledge sharing might potentially evoke conflicts of interest among individuals (Krogh *et al.*, 1994; Nonaka *et al.*, 2006; Davenport *et al.*, 1998; Liu and DeFrank, 2012). Firms, therefore, are always on the lookout for tools or systems that can overcome organisational and individual barriers, enabling employees to share knowledge effectively so as to improve innovation performance (Schwaer *et al.*, 2012).

Previous literature has studied a number of important antecedents for knowledge sharing, for example, the types of organisational structure that improve the efficiency of knowledge sharing (e.g. a centralised and functional structure and organisational hierarchy) (Nonaka and Takeuchi, 1996; Pierce, 2012) and the impact of organisational culture and climate (e.g. organisational culture oriented toward innovation or individual competition) (Argote and Ingram, 2000; Bock *et al.*, 2005). Also, at the individual level, there is the motivation and perception of individuals toward knowledge sharing (e.g. rewards, organisational justice, personality and trust) (Gagné, 2009; Ibragimova, 2006; Lin, 2007a, 2007b; Matzler *et al.*, 2011; Liao, 2008; Schwaer *et al.*, 2012).

Scholars have found that affective commitment is positively related to knowledge sharing (Camelo-Ordaz et al., 2011; Hislop, 2003; van den Hooff and De Ridder, 2004), and once individuals developed a positive emotion toward an organisation, the intention to perform extra-role behaviours, such as knowledge sharing, will grow because it demands positive intrinsic motivation (Becker and Kernan, 2003; Meyer et al., 2002; Williams and Anderson, 1991). Despite the growing literature (Cabrera and Cabrera, 2005; Han et al., 2010; Liu and Liu, 2011; Liu and DeFrank, 2012; Matzler et al., 2011; Schwaer et al., 2012), relatively little research has focused on the path that links individual cognition, motivation and behaviours of knowledge sharing. This creates difficulties in understanding the impact of knowledge sharing on organisational effectiveness, as well as some mediating factors and antecedents.

This paper studies the meditation roles of organisation-based psychological ownership (OPO) and knowledge-based psychological ownership (KPO) on the relationship between affective commitment and knowledge sharing. The authors use a conceptual model based on the logic that links "how I feel" (affective commitment), "what I should do" (psychological ownership) and "what I do" (knowledge sharing). "Knowledge sharing", "what I do", is based on an individual's action, but it requires interactions with other individuals and needs to be placed in a group context. It is thus necessary to aggregate this micro-level concept to explain a meso-level phenomena for improving organisational effectiveness (Felin and Barney, 2013).

The nuanced effect of affective commitment on knowledge sharing can be much more complicated than previous research frameworks suggest. The positive effect of affective commitment may be "transferred through" other mediators. The authors focus on the psychological ownership in this paper as a critical mediator in the relationship between affective commitment and knowledge sharing. This is mainly because employees' sense of ownership can result in an altruistic spirit (Pierce et al., 2001), thus contributing to organisational effectiveness, such as knowledge sharing. Moreover, Avey et al. (2009) extended the classical concept of psychological ownership and suggested that it in fact contains both positive and preventive aspects. The authors, therefore, include psychological ownership from two perspectives in the framework, i.e. employees' ownership of their organisation and their own personal knowledge. The authors propose that individuals with a higher level of OPO are more likely to share their knowledge with others, whereas those who cherish their knowledge and focus on the control of knowledge (KPO) might be reluctant to share knowledge with others.

Nevertheless, knowledge sharing is not a simple construct (Sitlington, 2012; Yen et al., 2014). Van den Hooff and De Ridder (2004) distinguished between denoting knowledge (i.e. communication with others about his/her personal intellectual capital) and collecting knowledge (i.e. consulting co-workers to get them to share their intellectual capital), and indicated that affective commitment has positive effects on both. Other scholars have tried to understand knowledge from the perspective of its nature, and argued that knowledge sharing is more difficult and more valuable for organisations to establish core competence with tacit knowledge (Augier et al., 2001; Lin, 2007a, 2007b; Swift and Virick, 2013; Hu and Randel, 2014). Along with this strand of literature, the authors argue that individuals are reluctant to share "key knowledge" that is related to their core interests, whereas they are willing to share "common knowledge" that is frequently used or not concerned with personal interests. The authors refer to the first type of knowledge sharing as key knowledge sharing, and the other as common knowledge sharing. Key knowledge includes some codified knowledge, while common knowledge contains the tacit one. In other words, the distinction between key and common knowledge is more comprehensive and closer to the reality of knowledge sharing in daily life than other classifications of knowledge sharing. The authors further hypothesised a positive association between common knowledge sharing and key knowledge sharing.

This paper extends and contributes to the knowledge sharing literature in two main ways. First, this study contributes to analysis of affective commitment by examining its influence through two types of psychological ownership on both key knowledge sharing and common knowledge sharing. Although affective commitment is important in facilitating knowledge sharing (Matzler et al., 2011), the authors argue that psychological ownership plays a significant role in this process. Individuals' knowledge sharing is an extra-role behaviour that is usually encouraged by strong intrinsic motivations (Lin, 2007a, 2007b). This study attempts to understand it via two practical aspects which overcome some drawbacks of existing distinctions of knowledge sharing. Examining how affective commitment and the two types of psychological ownership affect both common and key knowledge sharing is an important test of their validity as a positive mental resource and extends the understanding of psychological ownership and knowledge sharing. In this way, this paper also contributes to the micro-foundation of knowledge management (McAdam and McCreedy, 2000) by providing a viable way of understanding the dynamics among individual-level attributes.

Second, this research contributes empirically to the management of knowledge in human resources. Current organisational paradigms for encouraging knowledge sharing tend to focus on using modern information technology facilities and technologies, or providing individuals with a comfortable workplace. Relatively little attention has been paid to connecting human resource management with organisational knowledge management (Han et al., 2010). This study suggests that a positive regulatory system and organisational culture are helpful to increase individuals' emotional attachment and responsibility in organisations (Cushen and Thompson, 2012). A high level of affective commitment and the sense of being an "owner" of an organisation can encourage more knowledge sharing behaviours among individuals. Moreover, routine sharing of common knowledge would lead to a high possibility of key knowledge sharing (Nonaka et al., 2006). This research suggests that managers take account of the importance of psychological aspects of individuals when attempting to encourage knowledge sharing in organisations.

The remainder of the paper is as follows. In the next section, the authors develop several hypotheses in light of theoretical and empirical works on knowledge sharing and physiological and organisation ownership. Following this, the authors describe the data and methodology and then report research results. The last section concludes the paper.

2. Theoretical development

2.1 Affective commitment and psychological ownership

Affective commitment has been regarded as organisational commitments and reflects an important aspect of employees' motivation of working in organisations (Allen and Meyer, 1990; Meyer and Allen, 1991). The authors focus on affective commitment in this research, as it refers to individuals' identification and involvement with, and emotional attachment to, an organisation and its goals (Camelo-Ordaz et al., 2011; Meyer et al., 2002). Employees' emotional attachment is believed to be a main driver of their intention to remain in an organisation and cherish the opportunity of working there (Wright and Kehoe, 2008). From the perspective of social identification, affective commitment is an employee's strongest emotional sense that attaches to an organisation as well (Carmeli, 2005; Ellemers et al., 1999).

Prior studies connected employees' affective commitment with their psychological ownership and suggested a positive link between them (Han et al., 2010; O'Driscoll et al., 2006; Sieger et al., 2011; van den Hooff and De Ridder, 2004). Psychological ownership is defined as an individual's cognitive ownership of tangible or intangible targets (Pierce et al., 2001). Such cognition makes individuals regard substantial or non-substantial things as their personal belongings (Belk, 1988). More precisely, psychological ownership is "the state in which individuals feel as though the target of ownership or a piece of that target is

theirs", and reflects "an individual's awareness, thoughts, and beliefs regarding the target of ownership" (Pierce et al., 2003, p. 86).

The term "target" in the psychological ownership literature is quite broad, including personal or group attachment, facilities in the workplace and personal output in an organisation (Avey et al., 2009; Pierce et al., 2001). Such targets of ownership are likely to be deeply rooted in an individual's self-identity which leads to a view of extension of oneself (Cram and Paton, 1993; Dittmar, 1992). The key feature of psychological ownership is controlling an object. Pierce et al. (2001) suggested that the higher the level of employees' controlling sense, the more likely they view objects (targets) as extensions of themselves. Indeed, ownership and self-identity are interrelated, both of which lead to employees' territorial behaviours. Specifically, employees tend to mark or defend their territory in a sense of identifying and protecting belongings as an extension of themselves (Brown et al., 2005). Van Dyne and Pierce (2004) pointed out that OPO is the extent to which an individual feels ownership of an organisation, while organisational commitment is the degree to which an individual wants to continue his/her membership in an organisation.

The target of OPO varies according to the different levels of an organisation, for instance, organisations, departments, teams and groups (Pierce et al., 2001). The perception of belonging to an organisation is a type of personal sense of organisational membership (McMillan and Chavis, 1986). In this study, the authors predict that a higher level of OPO will encourage individuals to perceive organisational development as a part of self-development and become more favourable towards their work. Similar to other psychological resources, psychological ownership can be invested in and developed (Avey et al., 2009). The authors argue that affective commitment is an antecedent of OPO, as personal feelings of various aspects of the organisation may occur in a straightforward way, although emotional attachment needs some time to accumulate. OPO may be a higher-order psychological status towards the organisation, and once individuals accumulate a certain level of emotional attachment with the organisation, they are more likely to treat the organisation as an important belonging of themselves from the psychological perspective. Indeed, the authors admit that OPO may, in turn, have a positive impact on reinforcing individuals' personal preference for an organisation. In this study, the authors argue that affective commitment has a main direct effect on OPO:

H1. Affective commitment is positively related to OPO.

Besides OPO, the authors focus on KPO as well. Personal cognition of knowledge varies due to various personal traits, for instance, gender, age, education level, etc. (Matzler et al., 2011, 2008). Similar to OPO, employees' KPO is a sense of personal control for their knowledge, and the mental cognition that knowledge is a personal belonging. Avey et al. (2009) suggested two distinct forms of ownership. These included a more defensive, prevention-based ownership, and a more constructive, promotion-focused ownership, KPO is in line with the first form. The importance of knowledge has been highlighted in the knowledge-based economy era. Due to the intimate relationship between knowledge and innovation, employees' ideas are the source of organisational innovation (Kimberly and Evanisko, 1981). With such background, employees become more sensitive and careful in protecting their knowledge.

Moreover, Avey et al. (2009) argued that psychological territoriality prevents the flow of information across personal boundaries, while the distinction between personal and organisational boundaries might be ambiguous when employees offer emotional attachment to organisations. In other words, personal wisdom could contribute to an organisation's knowledge reservoir (Meso and Smith, 2000; Kim and Lee, 2006). Affective commitment is a helpful "tool" to mitigate the ownership of personal knowledge. It is more likely that individuals with high emotional investment in an organisation treat their knowledge as a "public" product and pay less attention to their personal control of such knowledge (Wright and Kehoe, 2008). As prior literature points out, affective commitment

is conducive to positive psychological behaviours (Luthans, 2002), e.g. job satisfaction and organisational citizenship behaviours. The low level of control of personal knowledge, experience and skill is helpful to stimulate individuals' positive psychological behaviours. Therefore, the authors posit the following hypothesis:

H2. Affective commitment is negatively related to KPO.

2.2 Psychological ownership and knowledge sharing

Knowledge sharing refers to activities that individuals engage in that involve sending or receiving knowledge from others (Cabrera and Cabrera, 2005; Schwaer *et al.*, 2012), and both the sender and receiver are equally entitled to the ownership of the knowledge during this process. Accumulating knowledge is vital for organisational innovation (Cohen and Levinthal, 1990), and knowledge sharing is believed to be useful in amplifying the knowledge stock of organisations (Cabrera and Cabrera, 2005; Haas and Hansen, 2007). However, knowledge sharing is a sensitive process and requires employees' engagement (Granovetter, 1973; Hansen, 1999; Nahapiet and Ghoshal, 1998; Reagans and McEvily, 2003; Szulanski, 2000). Adopting proper mechanisms (e.g. valuing employees' voices and designing promotion channels for employees) can encourage employees to match self-development with organisational objectives. The benefits produced by these mechanisms for both employers and employees are conducive to improving organisational efficiency that is reinforced by increasing key knowledge sharing within organisational boundaries (Bowen and Lawler, 1992).

OPO is a feeling of identifying organisational boundaries that make organisation members share knowledge or information to indicate organisational membership (McMillan and Chavis, 1986). In fact, when employees perceive the controlling object as extensions of themselves (Pierce *et al.*, 2001), they have a reciprocal responsibility or obligation towards the object. Employees' altruistic spirit is more likely to be encouraged in such circumstances, which can stimulate more organisational citizenship behaviours (Masterson and Stamper, 2003). Prior studies found that job satisfaction, work performance, etc., could be predicted by OPO (Avey *et al.*, 2009; Pierce *et al.*, 2001, 2003). In other words, an individual's OPO encourages a series of positive psychological feelings and behaviours. Van Dyne and Pierce (2004) pointed out that employees with a feeling of psychological ownership of their organisation may display an altruistic spirit, which has been viewed as an important antecedent for extra-role behaviour (e.g. knowledge-sharing) (Podsakoff *et al.*, 2000). Hence, the authors posit that individuals with a higher level of OPO will be more likely to share knowledge with others:

H3. OPO is positively related to both common and key knowledge sharing.

According to Higgins's (1997, 1998) regulatory focus theory, promotion and prevention are two fundamental self-regulation systems. Based on the regulatory focus theory, employees' psychological ownership of an organisation refers to a promotion-focused approach that pursues goals that reflect their hopes and aspirations, whereas employees' KPO involves prevention goals that show their intention to avoid punishment and obey rules and obligations (Higgins, 1997, 1998; Kark and Van Dijk, 2007). Preventative focus is necessary when employees are aiming to guarantee stability, safety and predictability (Avey *et al.*, 2009). Compared with promotion focus, employees with prevention focus were more reluctant to exchange tangible and intangible assets with colleagues (Avey *et al.*, 2009; Liberman *et al.*, 1999).

In accordance with previous arguments, employees' psychological ownership of knowledge is a manifestation of psychological territoriality that prevents outbound knowledge flow across personal boundaries. Sharing knowledge with others does not mean lost ownership of the knowledge, but the risk that conflicts of personal interests between sharers and receivers is increased (Krogh *et al.*, 1994; Von Krogh, 1998). If employees expect infringement on their targets of ownership, they may act to protect their

territory to demonstrate their ownership (Avey *et al.*, 2009). As noted by Brown *et al.* (2005), individuals are more likely to conduct territorial behaviours when they hold stronger psychological ownership of an object. Moreover, employees' fear of losing their territory and social identity and associated self may prohibit collaboration, transparency and information sharing (Avey *et al.*, 2009). Therefore, employees who care about personal knowledge are more likely to protect the ownership of knowledge in a manner of avoiding sharing with others. The authors, therefore, propose the following hypothesis:

H4. KPO is negatively related to both common and key knowledge sharing.

The majority of empirical evidence supports a positive association between affective commitment and knowledge sharing (Camelo-Ordaz *et al.*, 2011; Matzler *et al.*, 2011). However, according to the preceding sections, the authors strongly believe that affective commitment, in fact, transfers its positivity to knowledge sharing through other psychological variables.

An increasing number of studies adopt a distal–proximal approach to examine effects of personality and motivation on behaviour (Chen and Lim, 2012). Specifically, personality is frequently set as a distal cause of behaviours with a proximal factor like motivation. The authors argue that affective commitment is a distal variable that affects both common and key knowledge transfer. Specifically, individuals' affective commitment affecting their psychological ownership, i.e.:

- securing OPO; and

- mitigating KPO.

Their psychological ownership, in turn, activates sharing motivation that will either facilitate or impede common and key knowledge sharing. Therefore, the relationships between individuals' affective commitment and their knowledge sharing are mediated by their organisation and KPO. Thus, the authors posit that:

H5a. OPO mediates the relationship between affective commitment and both common and key knowledge sharing.

H5b. KPO mediates the relationship between affective commitment and both common and key knowledge sharing.

2.3 Common and key knowledge sharing

As discussed in previous sections, an individual's knowledge sharing is not a simplistic behaviour. Based on the varying codification of knowledge, knowledge sharing has been divided into several distinct types. For example, Zander and Kogut (1995) distinguished between four types of knowledge sharing based on the range of written and embodied knowledge, while Cummings (2004) proposed five types knowledge sharing from the perspective of specific content of shared knowledge. Indeed, knowledge cannot be easily shared (Krogh *et al.*, 1994; Zander and Kogut, 1995; Szulanski, 2000) while the properties of knowledge are closely related to knowledge sharing, diffusion, retention and accumulation (Argote *et al.*, 2003). The distinction between tacit and explicit knowledge is crucial, as it is helpful to understand the difficulty of knowledge transfer (Polanyi, 1966; Nelson and Winter, 1982; Ikujiro and Hirotaka, 1995; Spender *et al.*, 2000). However, this distinction may not be the best way to describe knowledge sharing, as individuals seldom consider whether the knowledge is tacit or codified when trying to share knowledge with others. Instead, individuals are more likely to consider whether sharing knowledge will harm self-interests in the future (Krogh *et al.*, 1994; Von Krogh, 1998). In other words, an important factor that impacts the decision to share knowledge is whether the knowledge has a close relationship with personal core interests. The authors define this type of knowledge as key knowledge and the others as common knowledge.

According to the interview with some staff in a machine manufacturing factory and a high-technology firm, the majority of them suggest that they are more likely to share key

knowledge with colleagues if they believe that the colleagues are worthy of sharing the knowledge. In other words, individuals are more likely to share key knowledge when they believe that the receivers will not undermine senders' benefits. Indeed, the more frequently one shares with others, the more likely it is they benefit from knowledge sharing and then encourage key knowledge sharing. In line with this logic and preceding arguments, the authors predict that both the organisation and KPO are more likely to affect individuals' common knowledge sharing, with common knowledge sharing, in turn, affecting their key knowledge sharing. On the basis of these arguments, the authors posit that:

H6a. Common knowledge sharing is positively related to key knowledge sharing.

H6b. Common knowledge sharing mediates the relationship between OPO and KPO with key knowledge sharing.

H6c. Common knowledge sharing and psychological ownership mediate the relationship between affective commitment and key knowledge sharing.

3. Research methodology and variable construction

3.1 Sample and procedures

The authors collected data for this study via mail surveys. Suggested by Brislin (1970), the authors translated English-language scales into Chinese and then independently back-translated into English to ensure equivalence. To validate the scale translation, the authors invited two English major professors to carefully review the scales. The authors also discussed the scale translation with two professors in the organisational behaviour field. During this process, the authors further improved the questionnaire according to their helpful suggestions. Moreover, prior to administering the survey, the authors conducted a pre-test with a group of MBA students and PhD candidates ($n = 10$) to obtain feedback regarding the clarity of language and presentation of items in the survey.

To test the relationships between the constructs, the authors conducted the survey in principal cities, e.g. Beijing, Shanghai and Guangzhou, and in a central province of China (Hunan Province). The authors randomly selected 50 high-technology firms based on the list of high-technology manufacturers in the local Science Park. A total of 500 copies (10 for each firm) of the questionnaires were sent out by mail. A cover letter with an explanation of the research and a standardised, self-report questionnaire were included. For some companies, the authors called the supervisors or the general managers to introduce the research objective and ask for assistance in administering the questionnaires. For each company, employees were randomly selected and asked to complete the questionnaire and return it to the research team directly so as to guarantee anonymity and the confidentiality of their answers. The survey was conducted in July and August of 2012, and the authors received 293 valid responses from 31 firms, yielding a final response rate of approximately 58.6 per cent. In total, 59 per cent of respondents were male, and nearly 74 per cent of were under the age of 30 years with an average tenure of about 3.5 years. Over half of the respondents (57 per cent) held a bachelor degree, with 9 per cent holding a master's or doctoral degree.

3.2 Measures

The authors assessed affective commitment (Cronbach's $\alpha = 0.94$) with six items from the scale from the salient work of Meyer and Allen (1991), in which they proposed a three-factor model for measuring organisational commitment. Specifically, the authors chose the subscale for affective commitment along with previous empirical studies. As a frequently used scale for assessing affective commitment, its content validity is guaranteed. A sample item includes "I would be happy to spend the rest of my career in this organisation". The authors scored all items from 1 (strongly disagree) to 6 (strongly agree). High scores reflect high levels of affective commitment. The composite reliability (CR) and average variance extracted (AVE) for this construct were 0.93 and 0.68, respectively.

The authors assessed OPO (Cronbach's $\alpha = 0.87$) with six items from the Psychological Ownership Scale (Van Dyne and Pierce, 2004). As the original psychological ownership scale was developed to assess the sense of personal control whereas the organisation is a collective concept, the authors changed the wordings of the original items to suit the context of this research. A sample item includes "The performance of this company is largely dependent on my effort". The authors scored all items from 1 (strongly disagree) to 6 (strongly agree). High scores reflect high levels of OPO. The CR and AVE for this construct were 0.85 and 0.55, respectively.

The authors assessed KPO (Cronbach's $\alpha = 0.81$) by adapting the scale proposed by Avey's et al.'s (2009) revised defensive psychological ownership scale. Following the logic of psychological ownership (Pierce et al., 2001), KPO is similar to the original definition of psychological ownership in many aspects. The authors define KPO as "the psychological sense or status toward controlling personal knowledge, and take the knowledge as a possession of personal belonging". Along with prior literature, the authors developed and refined the scale of KPO and finally obtained four items. A sample item includes "I feel it is necessary to protect self-knowledge to prevent others from stealing it". The authors scored all items from 1 (strongly disagree) to 6 (strongly agree). High scores reflect high level of KPO. The CR and AVE for this construct were 0.82 and 0.62, respectively.

The authors assessed common knowledge sharing (Cronbach's $\alpha = 0.90$) and key knowledge sharing (Cronbach's $\alpha = 0.86$) using the eight items adapted from Van den Hooff and De Ridder (2004) who distinguished between knowledge donating and knowledge collecting as parts of knowledge sharing; the authors focused on knowledge donating in this study. Generally, common knowledge sharing and key knowledge sharing are two dimensions of knowledge sharing, each of them having four items. Based on preceding arguments and also the validity test in the following section, the authors treated common knowledge sharing and key knowledge sharing as two distinct constructs. A sample item of common knowledge sharing includes "I would like to communicate with colleagues about my common working experience". The authors scored all items from 1 (strongly disagree) to 6 (strongly agree). High scores reflect high level of knowledge sharing. The CR and AVE for this construct were 0.89 and 0.67, respectively. A sample item of key knowledge sharing includes "I am willing to share with colleagues important working knowledge or skills". The CR and AVE for this construct were 0.85 and 0.58, respectively.

3.3 Control variable

The authors controlled for the effect of gender, tenure, education level and ownership of the company in which the respondent worked. This was because prior studies suggested that female workers are more likely to attach emotion to an organisation (Chiu and Ng, 1999), and the authors predicted that OPO might be affected by an employee's tenure, while individuals with a higher level of education would be more likely to protect their personal knowledge. Finally, some scholars indicated that foreign-invested companies have a stronger climate for innovation (Cheung and Lin, 2004), so the authors hoped to control for such an effect on knowledge sharing by adding ownership as a control variable into the following analyses.

4. Analysis and results

Table I reports the means, standard deviations, correlations and reliability coefficients of variables examined in this research. The reliability coefficients suggest that the internal consistency of all scales reached an acceptable level. The correlation table indicates that affective commitment and OPO were highly correlated ($r = 0.78$). These correlations were not inconsistent with previous studies. Although highly correlated ($r = 0.44$), common knowledge sharing and key knowledge sharing can receive different effects from antecedents. Rather than combining them as a single knowledge sharing construct, which may produce potentially biased results, the authors examined them separately. Moreover,

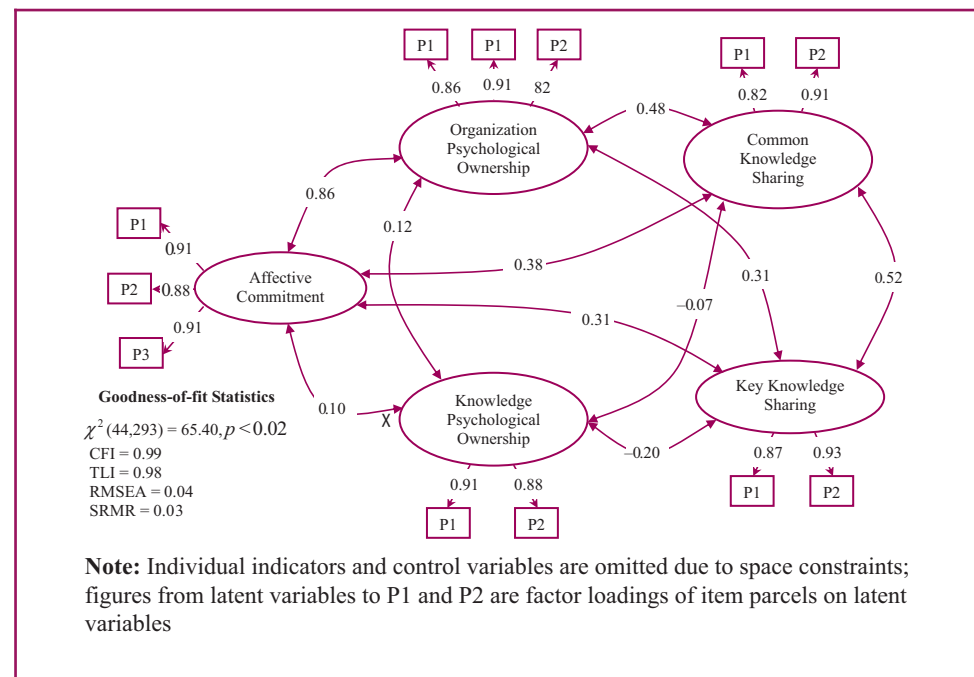| No.	Variable	Mean	SD	1	2	3	4	5	6	7	8	9
1	Gender	1.41	0.49	–								
2	Tenure	1.50	1.08	−0.09	–							
3	Education	2.67	0.74	−0.01	−0.20**	–						
4	Ownership of company	2.00	0.84	0.03	−0.05	−0.02	–					
5	Organization-based psychological ownership	4.12	1.14	0.00	0.08	−0.14*	−0.15**	(0.87)				
6	Affective commitment	4.00	1.17	0.00	0.10	−0.15*	−0.08	0.78**	(0.92)			
7	Knowledge-based psychological ownership	3.28	1.10	−0.02	−0.02	0.12*	−0.08	0.08	0.09	(0.81)		
8	Common KS	5.22	0.87	0.06	0.04	−0.02	0.03	0.40**	0.35**	−0.04	(0.90)	
9	Key KS	4.27	1.05	−0.02	0.01	−0.03	0.04	0.30**	0.29**	−0.17**	0.44**	(0.86)

Table I Means, standard deviations, and correlations

Notes: Cronbach's alphas appear in parentheses along the diagonal $n = 293$; *$p < 0.05$; **$p < 0.01$

the high correlation suggests a positive association between these two types of knowledge sharing, providing support for the prediction in *H6a*.

4.1 Confirmatory factor analyses and measurement model

Before testing the hypothesised model, the authors confirmed that the measurement model had acceptable fit with the data. A preliminary confirmatory factor analyses (CFA) suggested that all items loaded reasonably well on their latent factors. Along with prior studies, the authors parcelled items for each subscale in a pair-wise manner and examined whether these parcelled variables loaded adequately onto each latent variable. Following this, the authors ran a CFA for a measurement model with parcelled variables. Figure 1 indicates that the measurement model provided a good fit for the data ($\chi^2(44,293) = 65.40$, $p < 0.02$, CFI = 0.99, TLI = 0.98, RMSEA = 0.04, SRMR = 0.03).

The authors then compared the measurement model with several other competing measurement models to test for discriminant validity among our variables. In competing

Figure 1 Hypothesised measurement model

Note: Individual indicators and control variables are omitted due to space constraints; figures from latent variables to P1 and P2 are factor loadings of item parcels on latent variables

measurement Model 1, the authors assumed affective commitment was an indicator of OPO. In competing measurement Model 2, the authors assumed OPO and KPO were indicators of overall psychological ownership. In competing measurement Model 3, the authors assumed common knowledge sharing and key knowledge sharing to be indicators of knowledge sharing.

Table II documents the outcomes of the chi-square comparison tests. The right column of Table II shows that the differences in chi-square between competing measurement models and the hypothesised measurement model were significant. In other words, the hypothesised model provided a better fit for the data than other alternative models. This indicates that the variables in this research were empirically distinct from others and common knowledge sharing and key knowledge sharing were best analysed as separate constructs.

4.2 Common method variances tests

As the data were obtained mainly from the same respondents and all five constructs used subjective measures, a possibility of common method bias exists. Along with prior studies, the authors tested this bias using the Harman one-factor test (Scott and Bruce, 1994; Konrad and Linnehan, 1995; Simonin, 2004). Specifically, an exploratory factor analysis using all the items was conducted. The result showed that five factors accounted for 66.65 per cent of the variance, with the first factor explaining 29.19 per cent of the total variance. This result indicated that the common method bias was not a significant issue in the study (Podsakoff and Organ, 1986).

4.3 Model testing

The authors adopted structural equation modelling with Mplus 6.12 (Muthén and Muthén, Los Angeles, CA, USA; www.statmodel.com) to test the hypothesised structural model. Figure 2 illustrates the results of the hypothesised structural model with item parcels.

The hypothesised model provided a reasonably good fit with the data after controlling for the effects of gender, tenure and education level and ownership of company (χ^2(79, 293) = 145.17, $p < 0.01$, CFI = 0.97, TLI = 0.96, RMSEA = 0.05, SRMR = 0.05). The authors then conducted the nested model analysis suggested by Anderson and Gerbing (1988) to assess the absolute fit of the hypothesised model. Specifically, the hypothesised model was compared with a less constrained model where paths were added from affective commitment to common knowledge sharing and key knowledge sharing. The less constrained model is depicted in Figure 3.

The chi-square difference between the hypothesised model (χ^2(79,293) = 145.17, $p <$ 0.01) and less constrained model (χ^2(77,293) = 141.17, $p < 0.01$) was non-significant

Table II	Chi-square comparison tests between hypothesized measurement model and alternative measurement models						
Models	Chi-square	CFI	TLI	RMSEA	SRMR	$\Delta\chi^2$ from hypothesized measurement model
Hypothesized measurement model	χ^2(44,293) = 65.40, $p < 0.02$	0.99	0.98	0.04	0.03	–
Alternative measurement Model 1 (affective commitment as an indicator of organization psychological ownership)	χ^2(48,293) = 172.22, $p < 0.001$	0.93	0.91	0.09	0.04	$\Delta\chi^2$ = 106.82, $p < 0.001$, $\Delta df = 4$
Alternative measurement Model 2 (organization and knowledge psychological ownership as indicators of an overall psychological ownership)	χ^2(48,293) = 343.472, $p < 0.001$	0.83	0.78	0.15	0.10	$\Delta\chi^2$ = 227.09, $p < 0.001$, $\Delta df = 4$
Alternative measurement Model 3 (common and key KS as indicators of a KS behavior)	χ^2(48,293) = 290.10, $p < 0.001$	0.87	0.82	0.13	0.07	$\Delta\chi^2$ = 356.22, $p < 0.001$, $\Delta df = 4$

Figure 2 Structural model after controlling for gender, education, tenure and company ownership
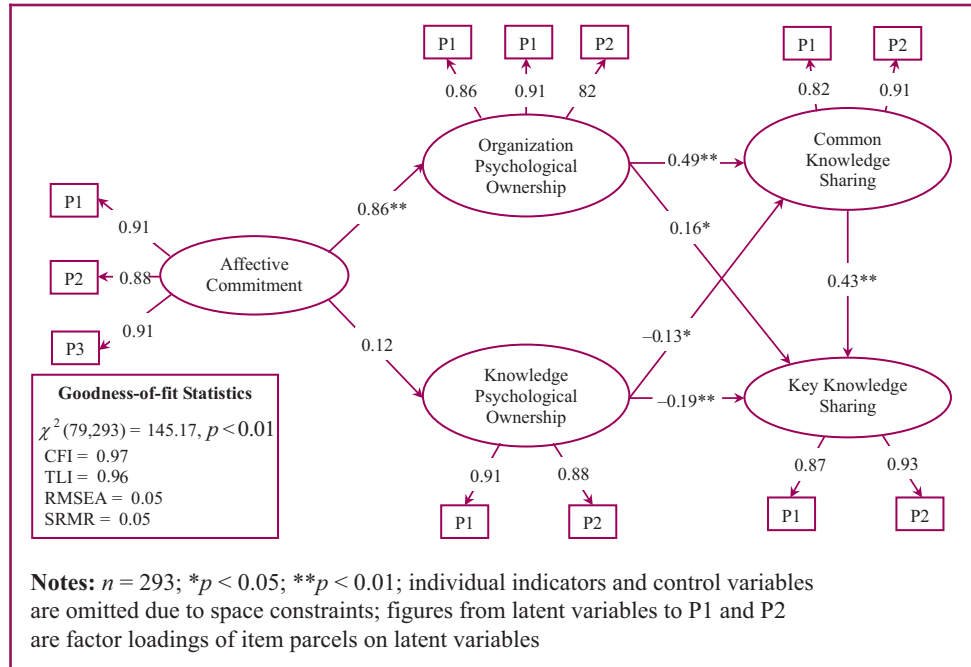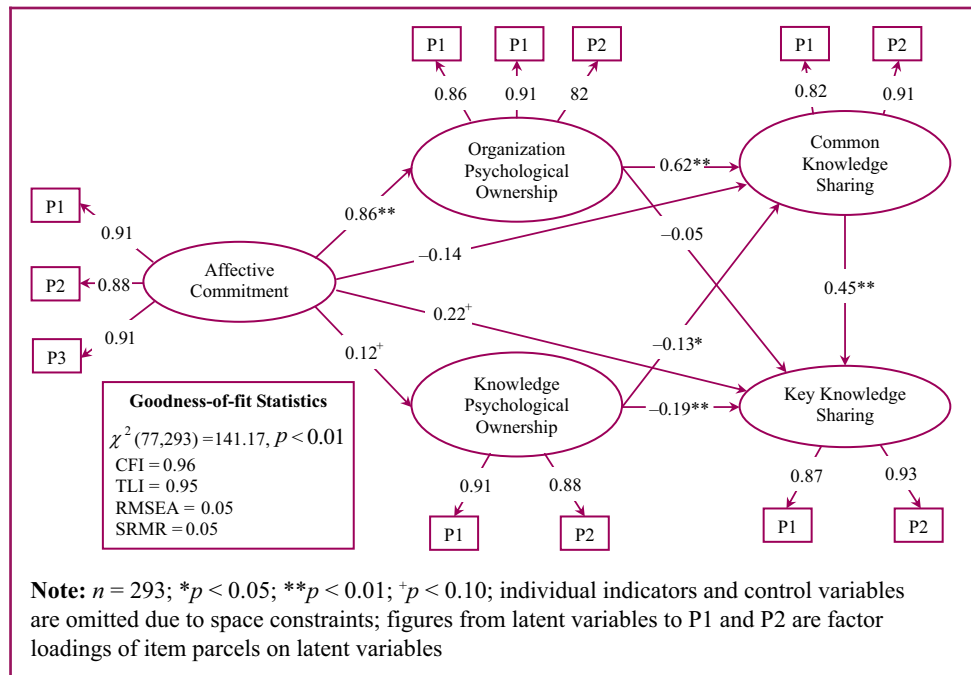

Notes: $n = 293$; $*p < 0.05$; $**p < 0.01$; individual indicators and control variables are omitted due to space constraints; figures from latent variables to P1 and P2 are factor loadings of item parcels on latent variables

Figure 3 Structural model with paths added from affective commitment to knowledge sharing

Note: $n = 293$; $*p < 0.05$; $**p < 0.01$; $^+p < 0.10$; individual indicators and control variables are omitted due to space constraints; figures from latent variables to P1 and P2 are factor loadings of item parcels on latent variables

($\Delta\chi^2 = 4.08$, $p < 0.13$, $\Delta df = 2$). Therefore, the hypothesised model was a better fit for the data than the less constrained model.

The analysis results indicated that affective commitment was positively and significantly associated with OPO ($\beta = 0.86$, $p < 0.01$), whereas affective commitment was positively

and insignificantly related with KPO ($\beta = 0.12$, $p = 0.10$). Thus, *H1* was supported but *H2* was not supported. Consistent with the hypotheses, OPO was positively and significantly associated with both common knowledge sharing ($\beta = 0.49$, $p < 0.01$) and key knowledge sharing ($\beta = 0.16$, $p < 0.05$) after controlling for the effects of KPO. Meanwhile, after controlling for the effects of OPO, KPO was negatively and significantly related to both common knowledge sharing ($\beta = -0.13$, $p < 0.05$) and key knowledge sharing ($\beta = 0.19$, $p < 0.01$). Thus, *H3*, *H4* and *H6a* were supported.

To test *H5a*, *H5b*, *H6b* and *H6c*, the authors examined the significance of multiple mediators. Preacher and Hayes (2008) suggested examining the specific indirect effect related to each mediator as well as the total indirect effect associated with all of them. Specifically, following their suggestion, the authors adopted the bias-corrected (BC) bootstrapping confidence interval (CI) analyses with a 5,000 bootstrap sample in Mplus to investigate whether the two types of psychological ownership and common knowledge sharing played significant mediating roles in corresponding relationships proposed in *H5a*, *H5b*, *H6b* and *H6c*.

Compared with the traditional method that tests the mediation effect (Baron and Kenny, 1986), the BC bootstrapping CI analyses have several advantages when testing for multi-mediation. First, by controlling for other potential indirect effects, this method can guarantee that the test results are specific to each specific mediator. Second, prior studies pointed out that the traditional method is largely dependent on testing each indirect effect separately via many simple mediators, while this method may yield biased parameter estimates which can be avoided by using a multi-mediator (Preacher and Hayes, 2008). Third, it is common to find that the assumption of a normal sampling distribution is problematic using survey data, and this method provides a robust test of hypotheses even when this assumption is mildly violated (MacKinnon *et al.*, 2004; Preacher and Hayes, 2008).

Along with previous studies, the authors set 95 per cent CIs for BC bootstrapping CI analyses, adjusting for median biasness and skewness. Preacher and Hayes (2008) suggested that if a mediator mediates the relationship between the independent and dependent variables significantly, the range of the 95 per cent BC bootstrapping CI of its indirect effect will not contain 0. Based on this criterion, the authors examined the estimated results in Table III.

First, the sum of indirect effects from affective commitment to common knowledge sharing was 0.40 (95 per cent BC bootstrapping CI = 0.27, 0.53). The specific indirect effect from affective commitment to common knowledge sharing via OPO was 0.42 (CI = 0.29, 0.54), and the estimated specific indirect effect from via knowledge psychological ownership was -0.02 (CI = -0.04, 0.01). These results indicated that OPO significantly mediated the relationship between affective commitment and common knowledge sharing, whereas knowledge psychological ownership did not.

Second, the sum of indirect effects from affective commitment to key knowledge sharing was 0.29 (CI = 0.16, 0.42). The specific indirect effect from affective commitment to key knowledge sharing via OPO was 0.14 (CI = 0.01, 0.27), and the estimated specific indirect effect from via knowledge psychological ownership was -0.02 (CI = -0.05, 0.01). These results indicated that OPO significantly mediated the relationship between affective commitment and key knowledge sharing, whereas knowledge psychological ownership did not. Hence, *H5a* was supported, whereas *H5b* was not.

Analyses also showed that the specific indirect effect from OPO to key knowledge sharing was 0.21 (CI = 0.11, 0.31). And the specific indirect effect from KPO to key knowledge sharing was -0.06 (CI = -0.11, -0.01). These results suggested that common knowledge sharing significantly mediated the relationships between the two types of psychological ownership and key knowledge sharing. Thus, *H6b* was supported.

Table III Mediation analyses

Mediating path	Estimates	Bootsrapping BC 95 % CI Lower	Upper
Effects of affective commitment to common KS			
Sum of indirect effect	0.40**	0.27	0.53
Specific indirect effect			
Affective commitment → organization psychological ownership → common KS	0.42**	0.29	0.54
Affective commitment → knowledge psychological ownership → common KS	−0.02	−0.04	0.01
Effects of affective commitment to key KS			
Sum of indirect effect	0.29**	0.16	0.42
Specific indirect effect			
Affective commitment → organization psychological ownership → key KS	0.14*	0.01	0.27
Affective commitment → knowledge psychological ownership → key KS	−0.02	−0.05	0.01
Affective commitment → organization psychological ownership → common KS → key KS	0.18**	0.09	0.27
Affective commitment → knowledge psychological ownership → common KS → key KS	−0.01	−0.02	0.01
Effects of organization psychological ownership to key KS			
Sum of indirect effect	0.21**	0.11	0.31
Specific indirect effect			
Organization psychological ownership → common KS → key KS	0.21**	0.11	0.31
Effects of knowledge psychological ownership to key KS			
Sum of indirect effect	−0.06*	−0.11	−0.01
Specific indirect effect			
Knowledge psychological ownership → common KS → key KS	−0.06*	−0.11	−0.01

Notes: n = 293; *p < 0.05; **p < 0.01

Finally, the specific indirect effect from affective commitment to key knowledge sharing via OPO and then via common knowledge sharing was 0.18 (CI = 0.09, 0.27), and the specific indirect effect from via KPO and then via common knowledge sharing was −0.01 (CI = −0.02, 0.01). These results indicated that OPO and common knowledge sharing significantly mediated the relationship between affective commitment and key knowledge sharing, whereas KPO and common knowledge sharing did not. Hence, *H6c* was partially supported.

4.4 Alternative models testing

Because alternative relationships between variables in the hypothesised model, e.g. OPO predicts affective commitment, exist in prior studies, the authors tested the robustness of the model by performing a series of comparisons between the hypothesised model with four alternative models with alternate explanations of the relationships between variables in this study. In alternative Model 1, the authors hypothesised OPO predicted affective commitment and KPO. In turn, affective commitment and KPO predicted common knowledge sharing and key knowledge sharing. In alternative Model 2, the authors hypothesised affective commitment predicted common knowledge sharing and key knowledge sharing. Common and key knowledge sharing subsequently predicted organisation and KPO. In alternative Model 3, the authors hypothesised common and key knowledge sharing to predict OPO and KPO. OPO and KPO, in turn, predicted affective commitment. In alternative Model 4, the authors hypothesised that common and key knowledge sharing predicted affective commitment. Affective commitment subsequently predicted OPO and KPO.

Because the hypothesised and alternative models were not nested, the authors compared the Akaike information criterion (AIC) and Bayesian information criterion (BIC) to assess the quality of the models. Chen and Lim (2012) suggested that the smaller of the two indicators (i.e., AIC and BIC), the more parsimonious and better fit of the model. As reported in Table IV, except the BIC of the hypothesised model (8644.43) being a little bigger than alternative Model 1 (88624.26), the AIC and BIC indices of the hypothesised model were

Table IV	Comparison of fit indices between hypothesized model and alternative models						
Models	Chi-square	CFI	TLI	RMSEA	SRMR	AIC	BIC
Hypothesized Model	$\chi^2(79,293) = 145.17$, $p < 0.001$	0.97	0.96	0.05	0.04	8,427.30	8,644.43
Alternative Model 1	$\chi^2(87,293) = 169.64$, $p < 0.001$	0.96	0.95	0.06	0.06	8,436.58	8,624.26
Alternative Model 2	$\chi^2(78,293) = 368.15$, $p < 0.001$	0.86	0.80	0.11	0.12	8,655.83	8,876.64
Alternative Model 3	$\chi^2(75,293) = 145.10$, $p < 0.001$	0.97	0.95	0.06	0.04	8,434.03	8,665.88
Alternative Model 4	$\chi^2(76,293) = 165.86$, $p < 0.001$	0.96	0.94	0.06	0.05	8,450.90	8,679.07

the smallest among all the models. Combined with other fitness indices, the hypothesised model exhibited the best fit for the data compared to alternative models.

5. Discussion

In this study, the authors connected affective commitment with knowledge sharing. More specifically, the authors introduced two types of psychological ownership, i.e. OPO and KPO, as mediators for the relationships between affective commitment and both common knowledge sharing and key knowledge sharing. Consistent with the authors' arguments, affective commitment was positively related to OPO, which was in line with prior studies (Van Dyne and Pierce, 2004). The results support the notion that affective commitment is an antecedent variable of OPO, which extends the existing literature on affective commitment and psychological ownership (Brooks and Wallace, 2006). The prediction that OPO mediates the relationship between affective commitment and both common and key knowledge sharing was also supported. This result indicated that affective commitment stimulates employees' altruistic spirit through their psychological ownership of the organisation and then affects knowledge sharing. It also extends prior studies that place affective commitment as a direct antecedent variable of knowledge sharing. More importantly, the authors conducted a nested model analysis in which the authors tested the direct effect of affective commitment on knowledge sharing after controlling for the mediating effect of psychological ownership. The results suggest that none of these direct effects was significant. Hence, the authors argue that the relationship between affective commitment and knowledge sharing is much more complicated than understood in previous studies, and that OPO is a critical mediator that transfers the positivity of affective commitment to knowledge sharing.

In addition, the authors found that employees who care more about controlling their personal knowledge (KPO) were less likely to share knowledge with others than those who care less. Interestingly, KPO had a stronger negative effect on key knowledge sharing than on common knowledge sharing, whereas OPO had a stronger positive effect on common knowledge sharing than on key knowledge sharing. These results indicate that it is more difficult to share key knowledge than to share common knowledge.

The empirical tests also supported the prediction that common knowledge sharing is positively related to key knowledge sharing. Rather than simply distinguishing knowledge sharing as donating and collecting knowledge, the authors proposed that a very important concern about whether to share knowledge with others was largely dependent on the nature of the knowledge. The findings suggest that common knowledge sharing can encourage employees to share their key knowledge with others. A potential explanation for this positive association is that knowledge senders may form a stable cognition by sharing with others. In other words, the more common knowledge sharing is, the more likely it is that individuals will believe sharing key knowledge with colleagues will not adversely affect their core interests. Thus, a climate that encourages employees to share ideas, experiences, skills or even daily life stories will eventually promote key knowledge sharing.

Additionally, common knowledge sharing played a mediating role in both the relationship between psychological ownership and key knowledge sharing and the relationship between affective commitment and key knowledge sharing. This result indicates that

knowledge sharing itself is complex and contains at least two levels. Compared with the extant studies that perceive knowledge sharing as a simple extra-role behaviour, this study extends the knowledge sharing literature by emphasising the two dimensions of knowledge sharing and suggesting possible roles of common knowledge sharing in mediating the relationship between other psychological perceptions and key knowledge sharing.

6. Conclusion

6.1 Brief summary of the paper's findings

The current research empirically examines the relationships between affective commitment, psychological ownership and knowledge sharing. Specifically, the authors argue that both organisation-based (OPO) and knowledge-based (KPO) psychological ownership mediate the relationship between affective commitment and knowledge sharing. The empirical analysis based on structural equation modelling with a sample of 293 employees supported the conceptual model: affective commitment has a significant positive effect on OPO but no effect on KPO; OPO is positively related to both common and key knowledge sharing, while KPO exerts a negative impact on both; common knowledge sharing is positively related to key knowledge sharing; and the relationship between affective commitment and key knowledge sharing is multi-mediated by OPO and common knowledge sharing.

6.2 Limitations of the research and findings

This paper has several limitations that future research might be able to overcome. First of all, the valid respondents in the sample were relatively young. This might affect the result, as younger workers may have strong intentions to share knowledge but they actually have insufficient knowledge accumulation. Though the authors took this concern into account by controlling for both age and tenure of respondents in estimations, future research should aim to collect a sample with a more balanced age structure and examine the effect of these factors on both common and key knowledge sharing. Second, the authors recognise that this research was carried out in the Chinese national context, which may not provide a suitable basis for generalising the findings. However, having considered companies of various sizes in different industries and locations in China, this gives greater validity to this research regarding the generalisation of the findings. Third, the authors realise that the self-reported and cross-sectional nature of the data impedes us from exploring causal relationships between variables. To obtain better inferences on how affective commitment and psychological ownership influence common and key knowledge sharing, a multi-wave or longitudinal survey is needed. Such an approach will help us to better understand how affective commitment and psychological ownership impact knowledge sharing over time.

6.3 Implications for practitioners and researchers

Findings of this research provide a detailed micro-foundation that links individual cognition and behaviour. They are also useful for researchers and practitioners, especially HR managers. First of all, human resource management practices that improve employees' feeling as the owner of the company will encourage employees to share common knowledge with colleagues and team members. However, more attention should be given to how HR managers can design appropriate incentives to encourage employees to share their core-interest-related knowledge (Whicker and Andrews, 2004). This means that apart from improving employees' emotional attachments to organisations, such as setting comprehensive salary systems that encourage staff welfare and performance, HR managers should design rules and programmes to encourage employees' participation in decision-making. Similarly, an intention of protecting personal intellectual capital will be more likely to prevent employees from sharing key knowledge compared to sharing common knowledge. Therefore, how to overcome the "psychological territoriality" of

knowledge is directly associated with accumulating valuable knowledge within an organisation.

Second, as there is a negative effect of KPO on knowledge sharing, HR departments are encouraged to help employees design a long-term career development path, which should be in line with an organisation's future development objective. This approach aims at mitigating the mental defence and prevention of sharing their knowledge with other colleagues or team members. Third, the positive relationship between common knowledge sharing and key knowledge sharing suggests HR managers and supervisors in each department should produce an innovative climate that can facilitate daily communication about any work-related issue. Such a climate is helpful to aid employees in sharing core knowledge within the organisational boundary. Some proper programmes, e.g. flexible organisational design, that encourage employees to collaborate with others in the organisation should be considered by HR departments, which assists employees in engaging in knowledge sharing that enhances organisational performance (Han *et al.*, 2010).

Finally, contrary to the hypotheses, affective commitment was positively but insignificantly related to KPO, and the mediating effect of KPO was also not significant. These results were unexpected as prior studies suggested that individuals with a high level of affective commitment are more willing to work for an organisation, but no concrete empirical evidence indicates a link between personal emotional attachment to an organisation and personal control of knowledge. In other words, individuals' emotional investment in an organisation is not strong enough to mitigate the prevention aspect of psychological ownership of knowledge. One plausible reason is that employees today are more likely concerned about their personal knowledge, as it is an essential source for finding jobs and promoting careers. Furthermore, the climate and culture of Chinese companies are not the same as those in Western countries (Gamble and Tian, 2012). Chinese employees may have a clear distinction between personal and organisational boundaries (Ralston *et al.*, 1997; Stanat, 2006), whereas workers in Western companies usually have higher awareness of intellectual property rights and thus they are more likely to protect their personal knowledge Therefore, HR managers in different contexts are encouraged to propose specific methods to facilitate employees' key knowledge sharing.

6.4 Possible areas for future research

Indeed, findings of this paper suggest a number of directions and opportunities for future studies to explore the areas of knowledge management and organisational behaviour. Among the many potential research questions, the authors suggest three most interesting and promising possibilities. First and foremost, the authors recommend future studies explore antecedents that affect psychological territoriality, e.g. KPO, and whether there are variables that moderate the relationships between OPO and KPO and knowledge sharing. Moreover, future studies could examine factors that may mediate the relationship between common knowledge sharing and key knowledge sharing, and the authors believe the mediating role of trust between knowledge sender and receiver is worthy to investigate. Finally, the current study mainly focused on the knowledge sharing at an individual level; therefore, the authors suggest future studies re-examine the hypotheses proposed in this research at the team level. This research would be both theoretically intriguing and practically important.

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Further reading

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