Why and when do people hide knowledge?

He Peng

Abstract

Purpose – The purpose of this paper is to examine why and when employees hide knowledge. Individuals may tend to hide knowledge when they have strong psychological ownership feelings over knowledge. Therefore, this research builds and tests a theoretical model linking knowledge-based psychological ownership with knowledge hiding via territoriality.

Design/methodology/approach – Data were collected from knowledge workers in China via a three-wave web-based survey. The final sample was 190 cases. Hierarchical regression models and a bootstrapping approach were used to test the hypotheses.

Findings – The results show that knowledge-based psychological ownership positively affects knowledge hiding. Territoriality fully mediates the link between knowledge-based psychological ownership and knowledge hiding. Moreover, organization-based psychological ownership moderates the positive link between territoriality and knowledge hiding. Specifically, territoriality will mediate the indirect effect of knowledge-based psychological ownership on knowledge hiding when organization-based psychological ownership is low, but not when it is high.

Research limitations/implications – The research reflects that to reduce knowledge hiding, organizations should focus on practices that can decrease employees’ self-perception of possession of knowledge and territoriality and that can strengthen employees’ psychological ownership for organizations.

Originality/value – Although many actions have been adopted to foster knowledge management in companies, knowledge hiding is still prevalent in work settings. This paper highlights the predictive power of knowledge-based psychological ownership on knowledge hiding, and the mediating role of territoriality in the link between knowledge-based psychological ownership and knowledge hiding.

Keywords China, Employees behaviour, Individual psychology, Knowledge management, Knowledge-based psychological ownership, Organization-based psychological ownership, Territoriality, Knowledge hiding

Paper type Research paper

Introduction

In an increasingly complex, knowledge-based and turbulent economy, the competitive advantages of more and more organizations depend on effective knowledge management. To gain and sustain competitive advantages, organizations need to develop systematic processes to create and leverage knowledge. One of the main tasks in knowledge management is taking steps to stop individuals hiding knowledge and letting them share their knowledge or information within their organizations.

However, much attention has been paid to why and when people share their knowledge, while very little attention has been devoted to why and when people hide their knowledge. People usually assume knowledge hiding or withholding is the opposite of knowledge sharing. A number of factors that contribute to knowledge sharing have been identified (Wang and Noe, 2010), including the influence of organizational culture (e.g. Davenport et al., 1998), management support (e.g. King and Marks, 2008), rewards and incentives (e.g. Yao et al., 2007), and interpersonal trust (e.g. Abrams et al., 2003). However, few studies have investigated the determinants of knowledge withholding or knowledge hiding.
Organizations also have taken many actions to facilitate knowledge sharing, but the effects cannot meet or surpass management's expectation (Babcock, 2004). Knowledge hiding is still prevalent in work settings today. It is reported that *Fortune* 500 companies lose at least $31.5bn a year by failing to share knowledge (Babcock, 2004). In a recent survey conducted in the USA, 76 percent of respondents admitted they once hid knowledge (cf. Connelly et al., 2012). Similarly, 46 percent of respondents reported they once conducted knowledge hiding in work settings in a survey from China (Peng, 2012).

Building on the above facts, researchers have recently begun to propose that knowledge hiding and knowledge sharing are not the opposite ends of a continuum, but are two distinct constructs (Connelly et al., 2012; Ford and Staples, 2010). The two constructs may have very different antecedents. Even though they may have similar behavioral manifestations, the underlying motivation and mechanisms are strikingly different (Connelly et al., 2012). Field observations also show that employees may conduct knowledge sharing and knowledge hiding simultaneously (Ford and Staples, 2008). They may share with colleagues some knowledge that is explicit and unimportant, but withhold other knowledge that is tacit and vital. Thus, as a prerequisite of facilitating knowledge transferring in organizations, researchers and practitioners need to understand why and when people hide knowledge in work settings (Connelly et al., 2012; Hinds et al., 2001; Davenport and Prusak, 1998).

Psychological ownership theory may provide a potential explanation for why people hide knowledge. According to psychological ownership theory (Pierce et al., 2001, 2003), individuals can easily form an ownership feeling over a target if they have constant control over it, invest much time or energy on it, or are familiar with it. In addition, individuals will be unwilling to share the target of ownership with others because they will experience loss of control and negative emotions if they share with others (Pierce et al., 2003). Since knowledge is acquired, controlled or created by them, individuals will easily feel the knowledge is their personal psychological property, and subsequently want to withhold it. Therefore, it is reasonable to propose that experienced psychological ownership for knowledge will be positively related to knowledge hiding.

In addition, a recent proposed territorial perspective may help to explain the underlying influencing mechanism in the relationship between knowledge-based psychological ownership and knowledge hiding (Webster et al., 2008; Brown and Robinson, 2007). According to territoriality theory (Brown et al., 2005), the stronger an individual's psychological ownership of an object, the greater the likelihood he or she will treat that object as his or her territory, and then protect and keep it (through defending) as his or her own. From such a viewpoint, if an individual experiences a strong feeling of ownership for the knowledge that he/she has acquired, created, controlled and invested in work, he/she will have a strong territoriality over his/her knowledge, which subsequently leads he/she to seek less interaction with others and to defend his/her knowledge territory (i.e. hiding knowledge). Thus, the present study proposes that territoriality is a more proximal variable than psychological ownership for knowledge hiding. Specifically, the present study proposes that territoriality will mediate the link between knowledge-based psychological ownership and knowledge hiding.

Moreover, the present study proposes that individuals' psychological ownership for the organization will weaken the effects of territoriality. Employees with a strong psychological ownership feeling for the organization will come to believe that they are significant, worthy, and valuable to the organization, and subsequently form a strong organization-based self-esteem (OBSE; Pierce and Rodgers, 2004). According to self-consistency theory, employees with high OBSE will put their efforts into those behaviors that will benefit their
organizations so that they can maintain and/or enhance their self-image. Since territoriality may do harm to organizations, employees with a high ownership feeling for the organization will in turn inhibit the negative effects of territoriality. Thus, it can be argued that the relationship between territoriality and knowledge hiding will be weakened by organization-based psychological ownership. In sum, the present study aims to build and test a moderated mediation model of knowledge hiding.

Theory and hypotheses

Knowledge hiding and knowledge-based psychological ownership

Knowledge refers to “a fluid mix of framed experience, values, contextual information, and expert insights that provides a framework for evaluating and incorporating new experiences and information” (Davenport and Prusak, 1998, p. 5). Specifically, in this study knowledge is defined as the information, ideas, and expertise relevant for the tasks performed by organizational members (e.g. Alavi and Leidner, 2001; Bartol and Srivastava, 2002; Connelly et al., 2012).

Knowledge hiding is defined as the withholding or concealing of task information, ideas, and know-how (e.g. Connelly et al., 2012). For example, an employee may withhold or control information from his/her colleagues. Knowledge hiding also implies that an individual will give less than the full effort to contributing to organizational knowledge (Lin and Huang, 2010). In addition, knowledge hiding may impair the collaborations in an organization, the development of new ideas, or the implementation of policies or procedures, and subsequently, it will do harm to the team and organizational performance.

Although knowledge hiding may have positive intentions or outcomes in some contexts (e.g. it may be intended to protect the other party’s feelings; cf. Connelly et al., 2012), it is usually a negative perspective on an individual’s knowledge contribution in most work settings. Knowledge sharing, in contrast, is a positive one. Just like counterproductive work behavior is different from organizational citizenship behavior (Dalal, 2005; Dalal et al., 2009), knowledge hiding is not opposed to knowledge sharing (Connelly et al., 2012; Ford and Staples, 2008). They are related but distinct constructs. Knowledge hiding may have a different psychological emerging mechanism. Even when antecedents are shared by both knowledge hiding and knowledge sharing, the underlying mechanism and effects of the antecedents are likely to be very different (Connelly et al., 2012).

Connelly et al. (2012) have identified several antecedents of knowledge hiding (e.g. perception of distrust, complexity of knowledge, task-relatedness of knowledge, and knowledge sharing climate). However, scholars still know little about the psychological mechanism of knowledge hiding. The present study will extend this growing literature by examining how and when knowledge-based psychological ownership affects knowledge hiding.

Psychological ownership theory is very useful to explain knowledge hiding (Webster et al., 2008). According to this theory, psychological ownership refers to a “state in which individuals feel as though the target of ownership or a piece of that target is ‘theirs’ (i.e. ‘It is mine!’)” (Pierce et al., 2001, p. 299). Psychological ownership is also said to exist when an individual is psychologically tied to an object and that object has become one with the individual, becoming a part of the extended self (cf. Belk, 1988; Dittmar, 1992). In addition, it has been theorized that individuals can experience ownership feelings of a wide variety of targets, including material and immaterial objects or entities within the organizational context (Pierce et al., 2001).

According to Pierce et al.’s (2001, 2003) arguments, there are three routes to the emergence of psychological ownership:

1. control of the target;
2. coming to know intimately; and
3. investment of the self into the target.
With regard to the knowledge relevant to the tasks, employees have personal control over it because the knowledge is acquired or created by themselves. They are also very familiar with the knowledge because they employ it every day in work settings. To acquire or create new knowledge, they also have invested much effort and time into the process. Thus, individuals can easily experience ownership feelings over their knowledge relevant to their tasks; this is especially true for knowledge workers.

Moreover, control over their knowledge is the key factor that influences individuals’ bargaining power over their organization. For employees, one principal source of bargaining power over organizations is the opportunity for the actor to access specialized knowledge (Bacharach and Lawler, 1980; Mechanic, 1962); that is, control over the knowledge determines the amount of compensation, the position in the organization, and the freedom to exit the organization. Individuals can elevate their own power and status relationships in organizations by owning and controlling knowledge. Therefore, it can be argued that most employees will develop a very strong psychological ownership over knowledge, because knowledge is so important for their existence in the organization.

Psychological ownership can satisfy an individual’s efficacy and effectance needs (Pierce et al., 2003). Thus, in order to satisfy their efficacy and effectance needs, individuals who experience strong psychological ownership are more likely to conduct dysfunctional behaviors to keep their control over the target and not let others control the target of ownership. Studies have also shown that individuals may experience personal loss, frustration, and stress when their experienced control is injured or transferred (Pierce et al., 2003; Bartunek, 1993). Since sharing the target of ownership often means transferring the controlling power over the target, individuals will try to keep their control over the target in order to avoid experiencing personal loss and uncomfortable emotions. The endowment effect (e.g. Thaler, 1980) and loss aversion (e.g. Tversky and Kahneman, 1991) also suggest that individuals are prone to overvalue the target over which they have possessive feelings and subsequently withhold the target. Following this logic, it can be reasoned that the individual who experiences strong knowledge-based psychological ownership is more likely to withhold knowledge than another who experiences a low level of knowledge-based psychological ownership because the former wants to satisfy his or her efficacy and effectance needs and avoid personal loss, frustration, and stress. Therefore:

H1. Knowledge-based psychological ownership is positively related to knowledge hiding.

Mediation by territoriality

Territoriality was first observed and studied in animals (Edney, 1974). In the mid-1980s, scholars began to view human territoriality over physical space and objects as a means to organize people so that violence, aggression, and overt domination would become unnecessary. Recently, territoriality in organizations was elaborated and theorized by Brown et al. (2005). The organizational perspective takes a much broader focus, no longer limited to territoriality over physical space and objects. According to this concept, individuals can experience territorial feelings and behavior over all aspects of organizational life (Brown and Robinson, 2007).

“ It is reasonable to propose that experienced psychological ownership for knowledge will be positively related to knowledge hiding.”
There are different definitions regarding territoriality. Taylor (1988) defined it as an intertwined system of emotions, beliefs, and behaviors that are very place-specific, socially and culturally influenced, and linked to person-place transactions dealing with issues of setting management, maintenance, and expressiveness. Thus, territoriality is believed to consist of three dimensions:

1. territorial cognition;
2. emotion; and
3. behavior.

Malmberg (1980) emphasized the motivation aspects of human territoriality and defined it as the impetus of humans to establish permanent or temporary control over territory. Brown et al. (2005) focused on the behavioral aspects and defined it as an individual's behavioral expression of his or her feelings of ownership toward a physical or social object. They argued that territoriality includes behaviors for constructing, communicating, maintaining, and restoring territories around those objects in the organization toward which one feels proprietary attachment. They identified two kinds of territorial behavior:

1. marking behavior; and
2. defending behavior.

Since there is some overlap between defending behavior and knowledge hiding, the present study emphasized the cognitive aspects of territoriality rather than its behavioral aspects.

In addition, just as the theory of reasoned action suggests that beliefs are very important to predict behavior (Fishbein and Ajzen, 1975), territorial cognition may play an important role in predicting knowledge hiding. Territorial cognitions include an individual's perception or belief of who should enter the territory, what goes on the territory, who should take care of the territory, or the types of activities that are allowed to take place in the territory (Taylor, 1988).

Although scholars define territoriality differently, most of them agree that territoriality has two basic attributes:

1. attachment to territories (Sack, 1983); and
2. the occupation and defense of territories (Edney, 1974).

The first attribute indicates that territoriality originates from psychological ownership. That is, psychological ownership is the psychological foundation of territoriality (Brown et al., 2005). Psychological ownership over objects or entities inherently implies that individuals attach themselves to these objects and entities. The second attribute indicates that territoriality toward an object or social entity will lead to the social construction of the territory, such as signaling and defending it from others. Consequently, territoriality provides valuable insights for disentangling the link between psychological ownership and employee behaviors.

Individuals who experience knowledge-based psychological ownership will experience a strong attachment to the knowledge. The ideas, knowledge, and information created and held by individuals tend to be a particular extension of their selves. The products of the mind are intimately known by their creator and holder. Thus, the ideas, knowledge, and information that the individual creates and holds are likely to be treated as his or her territories. Those who are high in knowledge-based psychological ownership will be more likely to experience a sense of territoriality.

To construct, communicate, maintain, and restore territories, individuals may conduct marking and defending behaviors (Brown et al., 2005). Marking involves the social construction of objects as territories, for example, public pronouncements of one's idea. Defending entails that the individual takes a variety of ways to prevent or respond to territorial infringements, such as holding knowledge privately, complaining to superiors, or yelling at invaders. Thus, those with a high level of territoriality are more likely to withhold knowledge than those with a low level of territoriality. Knowledge-based psychological ownership impacts knowledge hiding via its effects on territoriality. Hence:
H2. Territoriality mediates the relationship between knowledge-based psychological ownership and knowledge hiding.

**Moderation by organization-based psychological ownership**

As an important entity of individuals’ organizational life, the organization can also be experienced by individuals as an important target of ownership. Individuals who have a strong ownership feeling for the organization will feel possessiveness and psychologically attached to their organization. The present study proposes that psychological ownership for the organization will moderate the territoriality-knowledge hiding association. The rationale here is that organization-based psychological ownership is causally and positively associated with organization-based self-esteem (OBSE), through which it inhibits effects of territoriality.

Ownership can symbolize the self and show core value (Dittmar, 1992). It is common for people to experience psychologically the connection between the self and various targets of possessions (Dittmar, 1992). James (1890) also argued there is a fine line between “me” and “mine”. Thus, it is reasoned that psychologically owned target becomes part of the “extended self” (Belk, 1988). Just as Sartre (1969) wrote, “what is mine is myself” (p. 592). Therefore, individuals who experience strong psychological ownership for the organization will find themselves present in it. Individuals who are high in organization-based psychological ownership will also have positive self-assessments of themselves as organizational members, as there is value and/or importance attached to that ownership relationship. That is, they will come to believe that they are significant, worthy, and valuable to the organization, and subsequently form a strong feeling of organizational identification and OBSE (Pierce and Rodgers, 2004).

According to self-consistency theory, people who have positive images of themselves will engage in behaviors, possess attitudes and choose roles that reinforce that positive image. Empirically, Mullen (1998) found that mentors who have a strong sense of OBSE would be confident in their organizational role and more likely to mentor others. Aryee et al. (1996) also observed that individuals with high OBSE will be motivated to engage in the mentoring role, as it will provide them with the opportunity to demonstrate their organizational competence. In addition, Tang et al. (2000) found that OBSE is positively related to public (other serving) and negatively related to private (self-serving) motive. Thus, when employees feel the organization is their personal psychological property, they will put forth their efforts to those behaviors that will benefit their organizations so that they can maintain and/or enhance their self-image. Since territoriality is mostly driven by a self-serving motive and may do harm to organizations, employees with a high ownership feeling for the organization will in turn inhibit the negative effects of territoriality via OBSE. Thus, the relationship between territoriality and knowledge hiding will be weakened by organization-based psychological ownership. Therefore:

H3a. Organization-based psychological ownership moderates the relationship between territoriality and knowledge hiding. Specifically, organization-based psychological ownership will weaken the link between territoriality and knowledge hiding.

Assuming that organization-based psychological ownership moderates the association between territoriality and knowledge hiding, it is also likely that organization-based psychological ownership will conditionally influence the strength of the indirect relationship between knowledge-based psychological ownership and knowledge hiding. Since territoriality will be less strongly related to knowledge hiding when organization-based psychological ownership is higher, the following hypothesis is expected:

H3b. Organization-based psychological ownership will moderate the positive and indirect effect of knowledge-based psychological ownership on knowledge hiding (through territoriality). Specifically, territoriality will mediate the indirect effect (of knowledge-based psychological ownership on knowledge hiding) when organization-based psychological ownership is low but not when it is high.

The whole hypothesized research model is depicted in Figure 1.
Methods

Sample

All participants came from an IT industry company in Shanghai, China. In the final sample, 121 participants were male and 69 were female. The mean age of respondents was 30.4 years old (SD = 4.64). The mean organizational tenure was 3.17 years (SD = 2.95). All the respondents had a college degree or above. The sample covered a diverse range of occupations, including managers (27 percent), technologists (39 percent), and professionals (34 percent).

Procedure

In this study, data were collected from employees via a three-wave web-based survey. The measurement of predictor, mediator/moderator, and dependent variables were separated by a temporal lag to reduce biases (e.g. consistency motifs, illusionary correlations) that might occur in a cross-sectional study. However, if the time lag is too short, then it cannot reduce the salience of the predictor variable or accessibility in memory. If the lag is inordinately long, then it may allow contaminating factors to intervene between the measurements of the predictor and criterion variables, and subsequently could mask a relationship that really exists (Podsakoff et al., 2003). Thus, the present study adopted a two-month lag, which appeared to fit the criteria mentioned above, in that it is unlikely to be deemed either too short or too long.

Specifically, at Time 1, 300 participants were asked to complete a questionnaire on knowledge-based psychological ownership and demographic variables. Two hundred and sixty-eight participants finished the survey (89.3 percent response rate). About two months later, those respondents who finished the first-stage survey were asked to complete another questionnaire on territoriality and organization-based psychological ownership. Two hundred and thirty-two participants finished the second-wave survey (86.6 percent response rate). About another two months later, those who responded in the previous two stages were asked to complete the third-wave questionnaire on knowledge hiding. The style of the three-wave questionnaire was the same. A separate letter stating that all information would be confidential and only used for academic purpose was also included in all of the three-wave questionnaires. In addition, in each wave two reminder e-mails were sent to those who did not respond in time. One reminder e-mail was sent one week after the questionnaire was sent, and another was sent two weeks later. Finally, 190 participants finished all of the three stages of the surveys (63.3 percent total response rate). Thus, 190 cases were used for analysis in the present study.

Measure

Since the survey was performed in China, all the English measurements were translated into Chinese following the back-translation procedure (Brislin, 1970). The Appendix provides a listing of the measures for all constructs.
Knowledge hiding. Knowledge hiding was measured by adapting three items from a knowledge-withholding scale (Peng, 2012). Sample items included “Withhold helpful information or knowledge from others” and “Try to hide innovative achievements”. A five-point Likert scale ranging from 1 = never to 5 = always was used. Cronbach’s coefficient $\alpha$ for knowledge hiding was 0.91.

Knowledge-based psychological ownership. Knowledge-based psychological ownership was measured by rewording three items from Van Dyne and Pierce’s (2004) scale. The respondents were asked how they felt regarding the knowledge that they use in their work. An exemplar item was: “I feel a very high degree of personal ownership of the knowledge”. Response was made on a six-point Likert scale (1 = strongly disagree to 6 = strongly agree). Cronbach’s coefficient $\alpha$ was 0.92.

Territoriality. Territoriality was measured by rewording the four-item scale developed by Avey et al. (2009). An example of the items is: “I feel I need to protect my knowledge from being used by others in my organization”. Response was made on a six-point Likert scale (1 = strongly disagree to 6 = strongly agree). Cronbach’s coefficient $\alpha$ was 0.86.

Organization-based psychological ownership. Organization-based psychological ownership was measured by using four items from Van Dyne and Pierce’s (2004) scale. An example of the items is: “I feel a very high degree of personal ownership of this organization”. Cronbach’s coefficient $\alpha$ was 0.88.

Control variables. Previous studies have shown that individual differences (e.g. work experience) may influence employees’ knowledge behavior (e.g. Wang and Noe, 2010). Studies also showed that age (e.g. Marcus and Schuler, 2004), gender (e.g. Hershcovis et al., 2007), and organizational tenure (e.g. Gruys and Sackett, 2003) may influence negative behaviors in organizations. Thus, it is important to control for these factors that may have potential to influence the studied variables. In this study, gender, age, and organizational tenure were included as control variables. Age and organizational tenure were coded as continuous variables. Gender was coded as a dummy variable (1 = male, 0 = female). In addition, organizational role has served as a valuable concept for the study of individual behavior in organizations (Katz and Kahn, 1978). Since the role of managers is achieving goals through other people, it can be expected that managers may be less likely to be territorial and conduct knowledge hiding than technologists and professionals. Hence, position was also controlled in this study. Specifically, this study created two dummy position variables:

1. manager (1 = manager, 0 = others); and
2. technologist (1 = technologist, 0 = others).

Analysis

To examine the discriminant validity of the measures, an exploratory factor analysis for knowledge hiding, knowledge-based psychological ownership, territoriality, and organization-based psychological ownership was conducted via using SPSS 19.0. Results indicated a dominate four-factor solution based on the eigenvalues (i.e. larger than 1), with four factors explaining 79.3 percent of variance. The estimated factor pattern loadings for the model revealed that each item had large and statistically significant factor loadings on its hypothesized factor (0.81-0.93). In addition, the cross-loadings were relatively small (i.e. less than 0.35). Therefore, the results suggest that these factors are measuring unique constructs.

To test the hypotheses, a series of hierarchical regression models was used and examined. Specifically, the hypothesized mediating effect of territoriality was examined according to Baron and Kenny’s (1986) suggestions. According to Baron and Kenny (1986), four conditions are necessary for establishing mediation:

1. the independent variable must be significantly associated with the mediator;
2. the independent variable must be significantly associated with the dependent variable;
3. the mediator and dependent variable must be significantly associated; and
4. the relationship between the independent variable and dependent variable should be non-significant or weaker when the mediator is entered.

The hypothesized moderated mediation effect was further tested by utilizing bootstrapping approach according to Preacher et al. (2007) suggestions. In all the above tests, age, gender, organizational tenure, manager, and technologist were included as control variables. Territoriality and organization-based psychological ownership were mean-centered prior to calculating the interaction term (Aiken and West, 1991).

Results

The descriptive statistics and correlations for all variables are presented in Table I. Results showed that age, gender, and organizational tenure were not related to territoriality and knowledge hiding. However, manager was negatively related to territoriality and knowledge hiding. Technologist was positively related to knowledge hiding.

Tests of H1 and H2

The results for the hypothesized mediation are presented in Table II. The results show that knowledge-based psychological ownership was positively associated with knowledge hiding (Model 4: $\beta = .19$, $p < .01$), providing support for H1.

Table I  Mean, standard deviations, and correlations for the variables studied

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>30.41</td>
<td>4.64</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>2. Gender (male)</td>
<td>0.64</td>
<td>0.48</td>
<td>0.19**</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<tr>
<td>3. Organizational tenure</td>
<td>3.17</td>
<td>2.95</td>
<td>0.07</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<td>–</td>
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<td>–</td>
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<tr>
<td>4. Manager</td>
<td>0.27</td>
<td>0.44</td>
<td>0.17*</td>
<td>0.01</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>5. Technologist</td>
<td>0.39</td>
<td>0.49</td>
<td>– 0.11</td>
<td>0.27*</td>
<td>0.03</td>
<td>– 0.48**</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>6. Territoriality</td>
<td>3.39</td>
<td>1.02</td>
<td>– 0.14</td>
<td>0.05</td>
<td>0.05</td>
<td>– 0.23**</td>
<td>0.11</td>
<td>(0.86)</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>7. KPO</td>
<td>4.56</td>
<td>0.94</td>
<td>– 0.07</td>
<td>– 0.02</td>
<td>– 0.01</td>
<td>0.05</td>
<td>0.04</td>
<td>0.30**</td>
<td>(0.92)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>8. OPO</td>
<td>3.86</td>
<td>1.04</td>
<td>– 0.05</td>
<td>– 0.11</td>
<td>– 0.01</td>
<td>0.10</td>
<td>– 0.14</td>
<td>0.01</td>
<td>0.04</td>
<td>(0.88)</td>
<td>–</td>
</tr>
<tr>
<td>9. Knowledge hiding</td>
<td>1.49</td>
<td>0.79</td>
<td>0.02</td>
<td>0.11</td>
<td>– 0.06</td>
<td>– 0.14*</td>
<td>0.17*</td>
<td>0.28**</td>
<td>0.17*</td>
<td>– 0.29**</td>
<td>(0.91)</td>
</tr>
</tbody>
</table>

Notes: Reliability is shown on the diagonal within parentheses; KPO, knowledge-based psychological ownership; OPO, organization-based psychological ownership; n = 190; * $p < .05$; ** $p < .01$

Table II  Regression results for testing H1, H2, and H3a

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Territoriality</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Knowledge hiding</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>– 0.12</td>
<td>– 0.10</td>
<td>0.03</td>
<td>0.05</td>
<td>0.05</td>
<td>0.07</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>Gender(male)</td>
<td>0.09</td>
<td>0.10</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.03</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Organizational tenure</td>
<td>0.05</td>
<td>0.05</td>
<td>– 0.07</td>
<td>– 0.06</td>
<td>– 0.08</td>
<td>– 0.08</td>
<td>– 0.08</td>
<td></td>
</tr>
<tr>
<td>Manager</td>
<td>– 0.23**</td>
<td>– 0.26**</td>
<td>– 0.09</td>
<td>– 0.10</td>
<td>– 0.04</td>
<td>– 0.06</td>
<td>– 0.06</td>
<td></td>
</tr>
<tr>
<td>Technologists</td>
<td>– 0.03</td>
<td>– 0.06</td>
<td>0.08</td>
<td>0.07</td>
<td>0.08</td>
<td>0.09</td>
<td>0.09</td>
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</tr>
<tr>
<td>OPO</td>
<td>0.03</td>
<td>0.02</td>
<td>– 0.27**</td>
<td>– 0.27**</td>
<td>– 0.28**</td>
<td>– 0.18**</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>KPO</td>
<td>0.31**</td>
<td>0.19**</td>
<td>0.11</td>
<td>0.24**</td>
<td>0.23**</td>
<td>– 0.23**</td>
<td>0.23**</td>
<td></td>
</tr>
<tr>
<td>Territoriality</td>
<td>0.24**</td>
<td>0.23**</td>
<td>– 0.23**</td>
<td>– 0.23**</td>
<td>– 0.23**</td>
<td>– 0.23**</td>
<td>– 0.23**</td>
<td></td>
</tr>
<tr>
<td>OPO × Territoriality</td>
<td>F</td>
<td>2.36*</td>
<td>5.13**</td>
<td>3.88**</td>
<td>4.48**</td>
<td>5.49**</td>
<td>6.24**</td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.07</td>
<td>0.17</td>
<td>0.11</td>
<td>0.15</td>
<td>0.20</td>
<td>0.24</td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>$\Delta R^2$</td>
<td>0.07*</td>
<td>0.09**</td>
<td>0.11**</td>
<td>0.03**</td>
<td>0.05**</td>
<td>0.04**</td>
<td>0.04**</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Standardized regression coefficients are reported; KPO, knowledge-based psychological ownership; OPO, organization-based psychological ownership; * $p < .05$; ** $p < .01$
The results also showed support for $H2$ (i.e., a full mediation of territoriality in the link between knowledge-based psychological ownership and knowledge hiding) because Baron and Kenny’s (1986) four conditions for establishing mediation were totally satisfied. First, knowledge-based psychological ownership was found to be strongly associated with territoriality (Model 2: $\beta = 0.31, p < 0.01$). Second, just as $H1$ stated, knowledge-based psychological ownership was positively associated with knowledge hiding. Third, territoriality was also related to knowledge hiding (Model 5: $\beta = 0.24, p < 0.01$). Finally, the significant coefficient of knowledge-based psychological ownership for knowledge hiding was no longer significant after adding territoriality (Model 5: $\beta = 0.11, p > 0.05$). The indirect effect of knowledge-based psychological ownership on knowledge hiding via territoriality equaled 0.06. In addition, a Sobel test showed the indirect effect was significant ($Z = 2.65, p < 0.01$).

**Tests of $H3a$ and $H3b$**

Table II also presents the results for $H3a$, which predicts that organization-based psychological ownership will moderate the link between territoriality and knowledge hiding. Results suggested that the cross-production term between organization-based psychological ownership and territoriality was significantly negative (Model 6: $\beta = -0.23, p < 0.01$). The graph of the significant interaction (Aiken and West, 1991) is shown in Figure 2. Consistent with $H3a$, the territoriality-knowledge hiding link was weaker for participants with high organization-based psychological ownership than participants with low organization-based psychological ownership. Thus, $H3a$ was supported.

Table III presents the conditional indirect effects of knowledge-based psychological ownership on knowledge hiding via territoriality across low (i.e., one standard deviation below the mean), medium (i.e., mean), and high levels (i.e., one standard deviation above the mean) of organization-based psychological ownership. Results showed that, the conditional indirect effect of knowledge-based psychological ownership was stronger and significant in the low and medium organization-based psychological ownership condition (low = 0.11, medium = 0.06) but was weaker and not significant in the high organization-based psychological ownership condition (high = 0.01). Hence, $H3b$ was totally supported.
Discussion

The results of the present study supported the hypothesized model of knowledge hiding based on psychological ownership theory and territoriality theory. This study can make a number of contributions to this new and emerging area.

First, the present study linked knowledge-based psychological ownership with knowledge hiding. Compared to other variables (e.g. knowledge sharing climate), the present study proposed that the ownership feeling for knowledge is a more proximal variable for predicting knowledge hiding. The results demonstrated that if an individual feel the knowledge that he/she used in work settings is his/her personal property, he/she is more likely to conduct knowledge hiding. Since previous literatures on psychological ownership mainly focused on organization-based and job-based psychological ownership (e.g. Bernhard and O’Driscoll, 2011; Mayhew et al., 2007) and seldom investigated the effects of knowledge-based psychological ownership, the present study may also contribute to psychological ownership theory by its investigation of the effects of knowledge-based psychological ownership.

Second, to unfold the underlying mechanism of knowledge-based psychological ownership-knowledge hiding link, the present study adopted a territorial perspective. Since knowledge is acquired, controlled, or created by employees, they usually treat knowledge as their own personal properties and territories. It is helpful to use the territoriality theory to explain knowledge hiding. Webster et al. (2008, p. 11) also observed that “territoriality and feelings of ownership have been relatively ignored by researchers” and called for using this approach in knowledge management research. Consistent with psychological ownership theory and territoriality theory, the present study did find territoriality plays an important mediated role in the link between knowledge-based psychological ownership and knowledge hiding. Therefore, this study can respond to Webster and her colleagues’ call and fill the empirical void.

Third, the present study found that organization-based psychological ownership could weaken the indirect effect of knowledge-based psychological ownership on knowledge hiding via territoriality. This result describes when knowledge-based psychological ownership will lead to knowledge hiding via territoriality. When individuals feel a strong psychological ownership feeling for the organization, the indirect effect of knowledge-based psychological ownership on knowledge hiding will be not significant. This study therefore extends the existing finding that organization-based psychological ownership is negatively related to knowledge hiding (Peng and Pierce, 2012) to a more confounding effect that organization-based psychological ownership may also moderate territoriality-knowledge hiding link.

Theoretical implications

The development of the moderated mediation model of knowledge hiding and the empirical findings in this study provide a basic and solid foundation for future inquiry about knowledge hiding. As a start, the present study demonstrated that individuals’ personal psychological ownership feeling of knowledge (i.e. “it is mine”) is an important predictor for knowledge hiding. Recently, Pierce and Jussila (2010) extended psychological ownership from individual psychological ownership to collective psychological ownership. They argued that

<table>
<thead>
<tr>
<th>Level</th>
<th>OPO</th>
<th>Conditional indirect effect</th>
<th>Boot SE</th>
<th>Boot LL95 percent CI</th>
<th>Boot UL95 percent CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low = mean − 1SD</td>
<td>2.82</td>
<td>0.11</td>
<td>0.04</td>
<td>0.05</td>
<td>0.19</td>
</tr>
<tr>
<td>Medium = mean</td>
<td>3.86</td>
<td>0.06</td>
<td>0.02</td>
<td>0.03</td>
<td>0.10</td>
</tr>
<tr>
<td>High = mean + 1SD</td>
<td>4.90</td>
<td>0.01</td>
<td>0.02</td>
<td>−0.03</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Notes: Number of bootstrap samples for bias corrected bootstrap confidence intervals = 1, 000; LL, lower limit; CI, confidence interval; UL, upper limit; OPO, organization-based psychological ownership

Table III Conditional indirect effect testing for H3b

PAGE 408 JOURNAL OF KNOWLEDGE MANAGEMENT VOL. 17 NO. 3 2013
collective psychological ownership is the collectively held sense (feeling) that this target of ownership (or a piece of that target) is collectively “ours”. Collective psychological ownership may lead to a pride in intra-group sharing (e.g. of ideas, time, and energy) because the individual will elevate the team’s goals and success to a higher plane than one’s own personal interests (Pierce and Jussila, 2010). Therefore, compared to individual-level psychological ownership of knowledge, collective level psychological ownership of knowledge may have very different influences on knowledge hiding. Future research should investigate empirically the relationship between collective knowledge-based psychological ownership (i.e. “it is ours”) and knowledge hiding.

This study also supported that territoriality is a central mechanism that links knowledge-based psychological ownership to knowledge hiding, and therefore suggested that the self-protection motivational mechanism is a good mediator to unfold the effect of knowledge-based psychological ownership on knowledge hiding. Thus, this study provides a first examination of how and when psychological ownership has negative effects. In fact, although Pierce et al. (2001, 2003) have pointed out psychological ownership’s effects appear to be complex as some are positive, and others negative, scholars still know little about when and how psychological ownership turns out negative, and when and how it turns out positive.

Several studies (Constant et al., 1994; Jarvenpaa and Staples, 2000, 2001) have linked psychological ownership with knowledge sharing and proposed that psychological ownership has a positive effect on knowledge sharing. These studies suggested that when employees believe they own information they are more likely to engage in knowledge sharing, because the sharing of what they possess makes them feel needed, wanted and appreciated. As a means of self-expression and to show self-consistency, sharing expertise might have personal benefits, such as pride, increased personal identification with co-workers or the organization, more respect from others and a better reputation, and reduced alienation or stronger feelings of commitment (Constant et al., 1994). Thus, they suggested that the individual who believes knowledge belongs to oneself would be more likely to share knowledge. In their reasoning, self-enhancement motivation mechanism is thought as a good mediator to unfold the effect of knowledge-based psychological ownership on knowledge sharing. Therefore, the above analyses may remind us that knowledge-based psychological ownership may affect knowledge hiding and knowledge sharing simultaneously, but via a very different mechanism. That is, it affects knowledge hiding via self-protection motivation (i.e. territoriality) and influences knowledge sharing via self-enhancement motivation. Thus, future research could investigate these two mechanisms simultaneously in one study.

This study also showed that organization-based psychological ownership may weaken the indirect effect of knowledge-based psychological ownership on knowledge hiding via territoriality. Knowledge-based psychological ownership is an ownership of lower level targets, while organization-based psychological ownership is one of the higher-level targets. Thus, the present study’s findings may imply that the negative effects of lower-order target-based psychological ownership can be lessened by the positive effects of higher-order target-based psychological ownership. Future research could test this proposition by investigating more higher-order ownerships’ effects. For example, future research could examine whether the effects of territoriality on knowledge hiding can be inhibited by team-based psychological ownership.
Finally, the present study only investigated the moderating effects of organization-based psychological ownership. Other individual and organizational variables may also moderate the link between territoriality and knowledge hiding. For example, conscientiousness may weaken the relationship since conscientiousness is a consistent predictor of the propensity to exert effort (Mount and Barrick, 1995) and withhold counterproductive work behavior (Sackett and DeVore, 2001). Organizational knowledge sharing climate may also inhibit the negative effect of territoriality since in a strong such climate territoriality will be thought as unacceptable and those who transgress organizational norms are often sanctioned. Hence, future research could investigate these potential individual and organizational moderators in the link between territoriality and knowledge hiding.

Practical implications

Understanding how and when knowledge-based psychological ownership affects knowledge hiding has some practical implications. First, the present study found that knowledge-based psychological ownership is positively related to knowledge hiding. Thus, one way that organizations can reduce knowledge hiding is to focus on management practices that decrease an individual's self-perception of possession of knowledge. For example, the organization can reduce individuals' knowledge-based psychological ownership by adopting some knowledge management tools, promoting teamwork, stressing the collective ownership of knowledge, and advancing individuals' organizational commitment.

Second, the present study found that territoriality mediates the link between knowledge-based psychological ownership and knowledge hiding. Thus, organizations can reduce knowledge hiding by taking measures (e.g. adopting open work spaces) to decrease individuals' territoriality.

Third, the present study found that organization-based psychological ownership may weaken the link between territoriality and knowledge hiding. Thus, organizations can reduce knowledge hiding by strengthening individuals' organization-based psychological ownership. There are many ways to improve individuals' organization-based psychological ownership, such as encouraging employees to participate in the organization's activities and decisions (Pierce et al., 2004), giving employees stock ownership (Pierce et al., 1991; Pierce and Gardner, 2004), and increasing their control over their jobs (Pierce et al., 2004; Mayhew et al., 2007). In addition, this finding may imply that organizations can reduce individuals' knowledge hiding by promoting employees' higher-order territories (e.g. team, organization) than knowledge.

Limitations

First, the present study did not differentiate between tacit and explicit knowledge because it mainly focused on general knowledge. Although the model can explain both tacit knowledge hiding and explicit knowledge hiding, this study would contribute more if it could differentiate tacit and explicit knowledge. Tacit and explicit knowledge have different characteristics (e.g. Nonaka, 1994; Gourlay, 2006). Compared to explicit knowledge, tacit knowledge is more "sticky" and hard to formalize and communicate (Szulanski, 1996; Nonaka, 1994). Hence, tacit knowledge is easier for individuals to hide than explicit knowledge. In addition, individuals may be more prone to hide tacit knowledge because it is more related to individuals' personal competitive advantages than explicit knowledge. Therefore, tacit knowledge hiding could be more prevalent than explicit knowledge hiding. Their underlying

“Organizations can reduce knowledge hiding by taking measures (e.g. adopting open work spaces) to decrease individuals’ territoriality.”
mechanisms may also have some differences. Hence, future research could replicate the present work via differentiating tacit and explicit knowledge hiding. Future research also could pay more attention to tacit knowledge hiding.

Second, although this study mitigated common method variance (Podsakoff et al., 2003) by collecting data from employees three times, it still had some risks since all the information was reported by the same respondents. However, it should be noted that self-report is an appropriate way to measure these variables. Just as Spector (1994) argued, self-report may be quite useful in providing a picture of how people feel. Therefore, self-report is appropriate for measuring psychological ownership and territoriality. In terms of knowledge hiding, self-report may be the best way of assessment, because typically only the informer could know if knowledge hiding occurred. Peers or recipients of knowledge can only report on the knowledge that is shared (Ford and Staples, 2008). In addition, this study has tried to minimize the costs of self-report via assuring the participants of anonymity. However, future research is still encouraged to replicate the present work through the employment of an experimental design to validate the findings of this study further.

Finally, the scale used to measure knowledge hiding in this study consisted of just three items. Although this scale is adapted from a validated scale, there is a potential threat that the construct may be under-represented because of the lack of a large number of items (Messick, 1989). However, the number of items to include depends on the length of the testing time. Since the testing time is very limited for employed workers, a short scale is preferable. However, future research is still encouraged to replicate the present work using another scale to validate the findings of this study further.

Conclusion

This study provides a first empirical attempt to understand when and how knowledge-based psychological ownership affects knowledge hiding. The present study found that knowledge-based psychological ownership is positively related to knowledge hiding. In addition, territoriality mediates the relationship between knowledge-based psychological ownership and knowledge hiding. Moreover, the present study found that organization-based psychological ownership may weaken the link between territoriality and knowledge hiding. The present research can help academicians and practitioners to understand why and when people hide knowledge, and to sharpen their view on current knowledge transferring practice. Organizations can reduce knowledge hiding by decreasing individuals’ self-perception of possession of knowledge, or decreasing individuals’ territoriality, or strengthening individuals’ organization-based psychological ownership. Future research can differentiate explicit and tacit knowledge hiding, and focus on how collective knowledge-based psychological ownership influence knowledge hiding. Future research also can examine other moderators, such as team-based psychological ownership, conscientiousness, and knowledge sharing climate.

References


### Appendix

#### Table AI  Items and sources of measurement for constructs

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Items</th>
</tr>
</thead>
</table>
| Knowledge-based psychological ownership<sup>a</sup> | KPO1  This is My knowledge  
KPO2  I feel a very high degree of personal ownership of the knowledge  
KPO3  I sense that this is MY knowledge |
| Organization-based psychological ownership<sup>a</sup> | OPO1  This is My organization  
OPO2  I feel a very high degree of personal ownership of the organization  
OPO3  I sense that this is MY company  
OPO4  I sense that this organization is OUR company |
| Territoriality<sup>b</sup> | T1  I feel I need to protect my ideas from being used by others in my organization  
T2  I feel that people I work with in my organization should not use my information and ideas without my permission  
T3  I feel I need to protect my knowledge from being used by others in my organization  
T4  I feel I have to tell people in my organization not to use the information, ideas, and know-how that are mine |
| Knowledge hiding<sup>c</sup> | KH1  Withhold helpful information or knowledge from others  
KH2  Try to hide innovative achievements  
KH3  Do not transform personal knowledge and experience into organizational knowledge |

**Notes:**  
<sup>a</sup>Items adapted from Van Dyne and Pierce (2004);  
<sup>b</sup>items adapted from Avey et al. (2009);  
<sup>c</sup>items adapted from Peng (2012)

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### About the author

He Peng is currently an Associate Professor in the School of Management, Fudan University, China. He holds a PhD degree from Fudan University. His current interests include knowledge management, counterproductive work behavior, and Chinese management. He Peng can be contacted at: fdpenghe@gmail.com

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