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Knowledge Sharing Behavior: Clarifying Its Measurement and Antecedents

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by

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Abstract

There is increasing recognition that informal learning is a crucial component of organizational functioning and a necessary complement to the formal training that employees receive. As jobs evolve and demand more complex skills, workers must use informal learning to adapt to ever-changing work requirements. Informal learning is often dependent on voluntary knowledge sharing behavior, as evident among members of mastermind groups or communities of practice. In order to assist organizations, researchers must seek to understand the factors that motivate employees to engage in knowledge sharing behavior.

Empirical research on knowledge sharing is nascent. There exists only a handful of quantitative studies examining organizational factors (e.g., rewards) and individual factors (e.g., learning goal orientation and personality) as they relate to knowledge sharing attitudes, intentions, and behaviors. This body of work is also muddied by inconsistent operationalizations of constructs and a lack of an organizing framework. For instance, rewards have been popularly discussed and implemented as tools for incentivizing employees to perform. However, research has produced mixed findings regarding its effects on knowledge sharing behavior in organizations. There has also been a variety of different rewards examined without clear consistency in the results.

The present study addressed several research needs of this area. First, two separate samples were used to assess the psychometric properties (i.e., reliability and factor structure) of new measurement instruments developed for rewards, knowledge sharing behavior, and organizational learning culture. Item content validation was performed with 14 subject matter

experts. Scale dimensionality was established using exploratory factor analysis with data from a sample of 230 university students and confirmatory factor analysis with data from a second sample of 569 participants. Hypothesized relationships among dimensions of constructs as well as moderators were examined using regression analyses. Results did not support the popularly conjectured intrinsic versus extrinsic distinction between rewards. Results showed that rewards predicted knowledge asking but did not predict knowledge giving behavior. Non-financial rewards were found to vary in motivational value for knowledge giving depending on an individual's career stage. Three dimensions of goal orientation exhibited differential relationships with knowledge sharing behavior. Finally, this study demonstrated that the negative relationship between performance avoid orientation and knowledge giving was attenuated in a strong organizational learning culture, providing empirical support for the situational strength theory.

The findings from this work can inform organizational decision makers of how to harness the motivational value of rewards by understanding the career concerns of employees. This work also contributes by identifying person and situation factors that interact to facilitate a crucial kind of informal learning activity, knowledge sharing behavior in organizations.

Chapter 1: Introduction

Learning in organizations

Organizational learning is a term used to describe the process of organizational members acquiring useful knowledge and experience. Learning can occur through formal means, which is often prescriptive in the sense that formal trainings instruct the passive learner on what to do (e.g., instructor led training on standard operating procedures). Traditionally, employee learning has been viewed as a top-down process where organizational leaders determine employees' training needs and implement formal training programs. However, learning can also occur through informal means, such as through knowledge sharing with colleagues. Advancements in training research over the last half century have yielded best practices for the formal training of employees, but there exists considerably less research on the phenomenon of informal learning in organizations.

It has been posited that much of organizational learning takes place informally rather than in classrooms (Chao, 1997). In fact, studies across the United States and Asia report that workers attribute only a fraction of their professional development to formal training (Tannenbaum, 1997). There is now increasing recognition that a large part of organizational learning occurs through informal processes between learners.

There are many instances of how organizational functioning relies on informal learning. As the first example, formal training itself can be largely dependent on informal learning. They often occur together and likely complement each other to produce the best learning outcomes. For example, learning outcomes from formal training can be maximized when the learner

engages in self-directed learning behaviors, such as communicating with coworkers to ask questions and start discussions. Some researchers put forth that workers are continuously learning informally, and one hour of formal training can lead to several hours of informal learning (Stamps, 1998). In the next sections, I highlight several more ways in which informal learning is fundamental to organizational learning starting with newcomer socialization.

Newcomer socialization

Newcomer socialization is an essential process for every employee and organization. Individuals entering an organization must learn to fit into their new context. Newcomers must learn about other organizational members, how to perform their job tasks, and how to fit in successfully. Some of this learning may be gained from formal orientation or training programs, but much of what is learned also occurs through informal means, such as through self-initiated interaction with colleagues.

In order to proactively further themselves in the organization, newcomers query colleagues for knowledge. Tacit knowledge, in particular, is difficult to formalize and document, making it more effectively passed from one organizational member to another in socialization processes (Nonaka, 1994). Supervisors also play a role in newcomer socialization through mentoring relationships characterized by a mentee developing strong informal ties with a mentor who shares knowledge about his or her experiences, often through conversation and anecdotes (Ostroff & Kozlowski, 1992). Accordingly, newcomer socialization is largely an informal learning process facilitated by interactions among members of an organization.

Adaptability

Formal learning often takes priority (e.g., when safety training is rapidly needed); however, there are certain circumstances that call for informal learning, such as in situations of

abrupt or continual change (Tannenbaum, Beard, McNall, & Salas, 2010). Today's job requirements have intensified, demanding more adaptability and complex skills from workers. Organizations that rely solely on formal learning systems are likely less ready to adapt to changes compared to organizations that promote both formal and informal learning. Moreover, workers must continually drive their own learning in order to adapt their knowledge, skills, and abilities to meet changing demands.

A continual learner is one who works to consistently gain professional knowledge and skills that will aid in adapting to changes in the job. Continual learners are theorized to acquire knowledge and skills through capitalizing on chance events or "fortuitous encounters" that provide the opportunity to learn (Bandura, 1982). These fortuitous encounters are described to occur with members of one's social network, highlighting the informal and interpersonal nature of continuous learning (Molloy & Noe, 2010). Sessa & London (2006) propose that social networks consisting of diverse relationships or strong relationships can both lead to a high likelihood of fortuitous encounters that result in continuous learning and adaptability.

Active learning

A second aspect of continuous learning is characterized by deliberate choices regarding one's development, referred to as active learning. The term active learning stems from being active in one's self development and includes informal learning behaviors, such as metacognition, information seeking, and self-initiated learning (Bell & Kozlowski, 2008). According to Smith, Ford and Kozlowski (1997), research has documented the effectiveness of active learning strategies in promoting learning, performance, and especially adaptability.

For instance, learner-centered training designs are grounded in active learning or the notion that people learn better when they are actively engaged in self-directed extraction of

inferences (informal learning) as opposed to when they are passive recipients of information (formal or traditional training; Bell & Kozlowski, 2010). Metacognition is a self-regulatory process that involves developing one's own learning strategies, knowing where to focus attention, and monitoring cognitions during learning (Keith & Frese, 2005). Metacognition is critical for gaining the most out of informal learning opportunities and navigating instructorless learning contexts. Formal training that prescribes the correct procedures or solutions can prevent the learner from engaging in metacognition due to restricted opportunity for exploration. It can produce a concrete and inflexible representation of the information. An informal self-directed approach to learning can lead to understanding the problem more comprehensively as one works to develop their own solution, and ultimately new information is better integrated into existing knowledge structures (Frese et al., 1988).

The instructorless and exploratory nature of learner-centered training approaches are based on the idea that new knowledge is acquired through activities that the leaner initiates and controls (Bell & Kozlowski, 2010). They can create initial challenges for the learner, but research shows better long-term learning outcomes. Research suggests they are superior to traditional training (e.g., lecture-based instruction) for building complex skills and mental models (Frese, 1995; Heimbeck, Frese, Sonnentag, & Keith, 2003). Moreover, studies have shown that exploratory learning is more effective than proceduralized training for adaptive transfer or the transfer of skills to novel tasks (Bell & Kozlowski, 2008; Frese et al., 1988). These findings may be due to a mastery orientation that is induced from active learning, which can facilitate self-efficacy and adaptive performance (i.e., applying what they have learned to a new situation). Furthermore, with a mastery orientation, trainees are focused on *developing* their

competence rather than *demonstrating* their competence. The benefits are often not seen until transfer performance is assessed (Kanfer & Ackerman, 1989; Locke, 2000).

Overall, active learning strategies rely on informal means of learning and are instrumental in facilitating adaptive skill, or the ability to "flexibly adjust one's learning when the task becomes more difficult, complex, or dynamic" (Smith et al., 1997). This competency is becoming increasingly necessary for success as job evolve. Researchers and practitioners must reconsider the best ways to promote organizational learning, as traditional formal training methods may be inadequate for meeting evolving workforce demands (Bell & Kozlowski, 2010). Whether employees are deliberately seeking out information by way of active learning or capitalizing on fortuitous encounters, they are relying on informal learning processes. This warrants more research attention on the topic of informal learning and the behaviors it subsumes.

Informal learning

Informal learning activities differ from formal workplace trainings in that they are typically initiated by employees themselves for the purpose of improving their professional competencies (Lohman, 2005). Prevalent is the idea that working professionals are more interested in learning from each other rather than being passive recipients of information presentation, which is typical of traditional classroom training. Informal learning activities, as described above, may range from metacognition to participation in knowledge sharing with colleagues, such as in communities of practice or mastermind groups. Many of these activities are voluntary and self-initiated. It therefore follows that it is primarily dependent on the interest and motivation of employees to engage in such behavior. Accordingly, this study sought to investigate the factors that motivate employees to participate in informal learning, specifically knowledge sharing behavior.

Communities of practice

Communities of practice (CoP) are informal gatherings of colleagues or members of a field of practice who share knowledge with each other and contribute to discussions of work problems. An example is a group of colleagues who routinely meet and discuss work issues during lunch. They may share work stories, ask and give advice, or share work related information with one another. Communities of practice have been defined in the literature as face-to-face or virtual places where employees can discuss challenges, answer each other's questions, and use each other as learning resources during or after training. They have also been defined as informal groups within organizations wherein employees share expertise and experience through informal relationships (Hara, 2009; Wenger, McDermott, & Snyder, 2002). Finally, CoP have been defined by Wenger et al. (2002) as a "group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis."

Informal learning and CoP are often discussed in conjunction with each other. Some even regard a CoP as being defined by the informal learning that occurs within it. The theoretical basis for CoP posits that adults work and learn through social interaction (i.e., work and learning are social activities) rather than the simple acquisition of information (Lave & Wenger, 1991). Several core characteristics of CoP have been stipulated: domain, community, and practice; however, the foremost defining characteristic of CoP is the social interaction among CoP members (Li et al., 2009). The concept of CoP appears to be in line with Kraiger's (2008) push for a "third generation of learning" that emphasizes collaborative learner-learner interaction to facilitate the exchange of knowledge. Kraiger (2008) proposes that future training systems need to have a focus on delivering training in a way that recognizes knowledge as something that is

socially negotiated, meaning that learning is not the accumulation of an objective knowledge domain. Rather, learning is a process of socially negotiated shared meaning derived from interactions among people (e.g., knowledge comes from agreement when individuals compare their cognitions). CoP should serve as effective tools for facilitating organizational learning to the extent that people engage in knowledge sharing. The critical behavior that makes CoP valuable is the sharing of knowledge from colleague to colleague.

Knowledge sharing

Across the literature, the major reported definitions of the knowledge sharing construct are as follows. Knowledge sharing (KS) has been defined as "activities of transferring or disseminating knowledge from one person or group to another" (Lee, 2001). It has been defined as the behavior of giving task information to help or collaborate with others to create new ideas and solve problems (Pulakos, Dorsey, & Borman, 2003). Witherspoon, Bergner, Cockrell & Stone's (2013) meta-analysis defined KS simply as contributions among individuals. Bock, Zmud, Lee, and Kim (2005) included both tacit and explicit knowledge sharing in its definition. Tacit knowledge is knowledge that comes from ability or being experienced at something and often forms one's mental model. Explicit knowledge, on the other hand, consists of knowledge that can be easily written down, articulated, and transmitted to another person (Nonaka, 1994). Additionally, KS has been described to include exchanging ideas and seeking advice (Bednall, Sanders, & Runhaar, 2014). According to several researchers, knowledge sharing is the process of exchanging knowledge among colleagues, and the terms knowledge sharing and knowledge exchange have been used synonymously (Kim & Lee, 2013; Wang & Noe, 2010). Knowledge exchange has been defined as encompassing both knowledge giving (providing knowledge to others) and knowledge seeking (soliciting knowledge from others). Kim

& Lee (2013) stated that knowledge sharing occurs when an individual is willing to both learn and assist others in developing new capabilities. Finally, Usoro, Sharratt, Tsui, and Shekhar (2007) offer the following definition: "knowledge sharing is a process of communication between two or more participants involving the acquisition and provision of knowledge." In this study, knowledge sharing behavior (KSB) was conceptualized as an interpersonal process of knowledge transfer that involves requesting knowledge and providing knowledge between colleagues.

Many organizations have invested time and money into knowledge management initiatives, such as developing electronic systems to facilitate the collection and storage of knowledge (i.e., knowledge management systems). However, estimates of return on investment have been poor as these initiatives fail to actually facilitate knowledge sharing (Wang & Noe, 2010 citing Babcock, 2004). Installing a medium for knowledge sharing does not automatically produce knowledge sharing behavior. A large reason why knowledge sharing fails to occur may lie in how organizational factors and individual characteristics play a role. This study investigated how both factors as well as their interaction contribute to knowledge sharing behavior in organizations.

Literature review of knowledge sharing

Researchers have only scratched the surface in empirically examining the individual and organizational factors that might influence knowledge sharing. Furthermore, these factors and their relationship to knowledge sharing have been studied singularly; few studies have examined their interaction.

First, several studies have focused on features of the organizational context in relation to knowledge sharing. Lee, Kim, and Kim (2006) reported that management support is related to

willingness to share knowledge. Other studies have found that collectivism and loosely controlled culture are related to knowledge sharing (Chang & Lin, 2015). Behnke (2010) reported that tools and relevant training can influence knowledge sharing. Lastly, several studies have examined rewards and knowledge sharing. Some studies have found support for a positive relationship with KS behavior (e.g., Kankanhalli, Tan, & Wei, 2005) while others have not found a relationship with KS attitude, intention, or behavior (e.g., Behnke, 2010; Kwok & Gao, 2005). Additionally, Bock & Kim (2002) found a negative relationship between rewards and knowledge sharing attitude.

Individual characteristics are thought of as relatively stable personal attributes that may vary between people, such as personality traits, cognitive ability, interests and values. In terms of knowledge sharing, a small handful of studies have found the following relationships. Matzler, Renzl, Muller, Herting, and Mooradian (2008) reported relationships for knowledge sharing and three personality factors: conscientiousness, agreeableness, and openness. Cabrera, Collins, and Salgado (2006) also reported a link between openness and knowledge sharing. Self-efficacy has been linked to both knowledge sharing intention and behavior (Cabrera et al., 2006; Kankanhalli et al., 2005; Kuo & Young, 2008). Matzler & Mueller (2011) found a positive relationship between learning goal orientation and knowledge sharing but a negative relationship between performance goal orientation and knowledge sharing. Finally, some studies have reported that the enjoyment of helping is related to knowledge sharing (Kankanhalli et al., 2005; Chiu, Hsu, & Wang, 2006).

Lastly, a few attitudinal variables have been explored. Chowdhury (2005) found that affective and cognitive based trust at the dyadic level exhibited positive relationships with knowledge sharing. Lin (2007) reported that distributive and procedural justice perceptions

influenced commitment and trust which had effects on knowledge sharing. Hashim & Tan (2015) also found that trust and affective commitment were related to knowledge sharing. Cabrera et al. (2006) reported a positive relationship between organizational commitment and knowledge sharing behavior. See Figure 1 for a summary of the relationships reviewed in this section.

On the whole, rewards appear to have garnered the most research attention relative to other variables, but the relationship remains unclear, and more work needs to be done. Rewards for knowledge sharing have been defined by researchers in a variety of ways. A recent meta-analysis defined rewards as "anticipated pay increase, anticipated promotion, anticipated reciprocal relationships, and reputation building" (Witherspoon et al., 2013). This meta-analysis reported a significant positive relationship between anticipated pay/promotion and knowledge sharing intention as well as with knowledge sharing behavior. It also reported that reputation was positively related to knowledge sharing behavior, although it did not find a relationship with anticipated reciprocity. Lastly, the authors examined "intrinsic motivation," which they defined as the tendency to enjoy helping others through knowledge sharing and found a positive relationship with both knowledge sharing intention and behavior (Witherspoon et al., 2013). The shortcoming of this meta-analysis, however, is its failure to specify which primary studies were meta-analyzed for each relationship. It is thus difficult to determine which operationalizations were actually used for the constructs under investigation. For instance, it is unclear whether the meta-analyzed relationships with knowledge sharing behavior included measures of knowledge giving, asking, or both. As another example, it is unclear how studies were coded. Chiu et al. (2006) measured personal outcome expectations using items covering the expectation of friendship, cooperation, happiness, reputation, and accomplishment from knowledge sharing. It is unknown whether their study's effect size was included in the meta-analysis for the

relationship between "reputation" and knowledge sharing behavior or for the relationship between "reciprocity" and knowledge sharing behavior. Overall, it is difficult to draw confident conclusions from this meta-analysis. Furthermore, a meta-analysis can only be as good as the studies included in it. Primary studies with methodological issues (garbage in) can carry over and affect the meta-analytic results (garbage out). A literature review of primary studies in this area reveals that they have often used content contaminated (or deficient) measures of the knowledge sharing behavior construct. Taking this into account along with the mixed results produced by primary studies, the relationship between rewards and knowledge sharing behavior remains unclear (Wang & Noe, 2010).

An overview of operationalizations and results from past literature is presented in Table 1. To summarize, it appears that several studies examining what they label as "intrinsic" motivating factors and knowledge sharing have found a positive relationship (Cabrera et al., 2006; Kankanhalli et al., 2005; Liu & Fang, 2010; Ozlati, 2015; Witherspoon et al., 2013), although two studies have reported no significant relationship (Behnke, 2010; Chiu et al., 2006). These "intrinsic" factors have been operationalized as non-monetary rewards, praise, recognition, feeling of happiness, and enjoyment in helping others through knowledge sharing. It is worth noting that Chiu et al.'s (2006) measure actually included items assessing both "intrinsic" (e.g., feeling happy or a sense of accomplishment) as well as "extrinsic" factors as categorized by other researchers (e.g., building reputation and gaining cooperation or reciprocity).

In terms of the relationship between what researchers call "extrinsic" motivating factors and knowledge sharing, researchers have operationalized this variable as monetary or financial reward, promotion, improved reputation, image, and reciprocity. Several studies reported a

positive relationship (Cabrera et al., 2006; Kankanhalli et al., 2005; Witherspoon et al., 2013), while several studies reported no significant relationship (Chiu et al., 2006; Kankanhalli et al., 2005; Liu & Fang, 2010). Additionally, Bock & Kim (2002) found a significant negative relationship between expected extrinsic rewards and knowledge sharing attitude.

The lack of consistency in results across studies makes it hard to draw conclusions. Wang and Noe (2010) have also noted the inconsistent findings in this area and suggested the need for further research. This situation is further complicated by the overlapping operationalizations of "intrinsic" and "extrinsic" rewards by some of the authors. Generally, motivation theories refer to "intrinsic" as something being inherently fulfilling (e.g., performing the behavior itself provides a rewarding feeling), while "extrinsic" is construed as obtaining a rewarding outcome apart from the behavior itself (Amabile, 1997). However, many knowledge sharing studies did not appear to ground their classification of "intrinsic" and "extrinsic" rewards in any theory or construct validity evidence. For instance, Choi, Kang, and Lee's (2008) operationalization of "intrinsic rewards" as praise and public recognition is problematic because it can be argued that praise and recognition are rewards given by the organization as a consequence for a desired behavior. In that sense they are contextual and external to the individual obtaining satisfaction from the behavior itself. Furthermore, reputation has been considered an "extrinsic" factor by many researchers, although it is conceptually similar to praise and recognition.

Interestingly, if we focus solely on knowledge sharing behavior, and if the findings are grouped according to operationalization rather than the "intrinsic" and "extrinsic" labels used by the authors, then a potential pattern emerges. Two studies measured monetary-based incentives and found positive relationships with knowledge sharing behavior (Cabrera et al., 2006; Kankanhalli et al., 2005). Three studies assessed feelings associated with knowledge sharing

behavior (e.g., fun, pleasure, a rewarding feeling) and found a positive relationship (Cabrera et al., 2006; Kankanhalli et al., 2005; Ozlati, 2015). Lastly, four studies reported no significant relationship with knowledge sharing behavior for reputation, image, praise, recognition or reciprocity (Behnke, 2010; Chiu et al., 2006; Kankanhalli et al., 2005; Liu & Fang, 2010). Wasko & Faraj (2005) was the only study to report a positive relationship for reputation and a negative relationship for reciprocity.

Definition of rewards

In this study rewards were defined as an expected non-punitive consequence to knowledge sharing behavior in organizations. Based on the literature review, this study deviated from the "intrinsic" versus "extrinsic" distinction of rewards and hypothesized the following separation of reward types: financial rewards (past studies imply a positive relationship with knowledge sharing behavior), affective rewards (past studies imply a positive relationship with knowledge sharing behavior), and relational rewards (past studies imply no significant relationship with knowledge sharing behavior).

The concept of rewards in this study may be analogous to how it is represented in operant conditioning (Skinner, 1938), where learning occurs by means of rewards and punishments. The principle of positive reinforcement says that a response tendency is increased when a motivating or desirable stimulus is given as a consequence (reward). Reward in operant conditioning has a similar meaning to the definition used in this study. Where it differs, however, is that operant conditioning requires the reward to be valued and motivating in order for it to be called a reward (e.g., something is a reward if it increases the frequency of behavior). The present study separated this concept into two variables, distinguishing between the reward itself and how much a person values the reward. In this study, reward refers to an expected positive consequence for

behavior. But it is only reinforcing of behavior to the degree that it is perceived as sufficiently valuable by an individual. When rewards are not perceived as sufficiently valuable by an individual, they are not motivating for behavior. Consider the following example. A promotion might be offered as a reward for performing knowledge sharing behavior. This reward is an outcome that organizational leaders would expect to be reinforcing of behavior, but individuals who are not looking for increased responsibility may not value the reward and therefore will not be motivated to increase their knowledge sharing behavior.

Measurement of knowledge sharing behavior

Reviewing past studies' measurement of knowledge sharing behavior (KSB) and rewards revealed a practical need for the development and validation of new scales that adequately capture each construct domain. To date there is no widely-accepted or validated measurement instrument for knowledge sharing behavior or for rewards. The studies in this area have used a variety of problematic measures that are either contaminated or deficient in representing the construct, particularly with regard to KSB.

For instance, Kim and Lee's (2013) instrument consisted of several items that assessed attitude or belief rather than actual knowledge sharing behavior (e.g, "I like to be informed of what my colleagues know" and "I think it is important that my colleagues know what I am doing"). Rather than a pure assessment of the extent of KSB, Jacobs and Roodt's (2007) items asked participants to report the extent to which they shared knowledge for various reasons, such as to get recognition, to get rewarded, or to satisfy their fulfillment needs. Liu and Fang (2010) used Van den Hooff and Van Weenen's (2004) knowledge sharing behavior scale that was contaminated with items assessing culture, for example, "knowledge sharing with my colleagues within my department is considered a normal thing." Wah, Menkhoff, Loh, and Evers (2007)

also used a scale where one of their four items specifically asked about a culture of knowledge sharing. Another issue is that some studies appear to only assesses the knowledge giving component of knowledge sharing behavior by using item wording, such as "knowledge *contribution"* (e.g., Kankanhalli et al., 2005; Wasko & Faraj, 2005) or "I *share my* ideas about jobs with my co-workers" and "I *talk about my* tips on jobs with my co-workers" (Lin, 2007). Other studies only assessed sharing of a certain kind of knowledge. For example, Bock & Kim (2002) and Lin (2007) only assessed tacit knowledge sharing but neglected to assess the sharing of explicit knowledge. Yi's (2009) knowledge sharing behavior scale has received validation support, however, its items were developed specifically for measuring knowledge sharing within academia and several items assessed general helping or citizenship behaviors, unspecific to knowledge sharing. For example, items on a scale of 1 (never) to 7 (always) included: "publish articles in university journals or newsletters," "support less experienced colleagues with time from personal schedule" and "spend time in personal conversation with others to help them with their work-related problems."

In accordance with the reported definitions above, I conceptualized KSB as consisting of both giving one's knowledge to others (knowledge giving) as well as procuring knowledge from others (knowledge asking). Knowledge giving has been referred to as, "communicating to others what one's personal intellectual capital is," while knowledge asking has been referred to as, "consulting colleagues in order to get them to share their intellectual capital" (Van den Hooff & De Ridder, 2004). In other words, knowledge giving is the act of passing intellectual capital to others while knowledge asking is the act of procuring intellectual capital from others. Furthermore, knowledge has been defined to include task information, expertise, contextual

information, know-how, and work-related experience that helps to solve problems, develop new ideas, or implement procedures (Cummings, 2004; Kim & Lee, 2013; Lin, 2007).

In sum, a measurement instrument for KSB that adequately captures the construct should include items that assess the provision of tacit and explicit knowledge as well as behaviors in the acquisition of tacit and explicit knowledge. The development of a content valid scale was the first goal of this study, followed by demonstrating evidence of the psychometric soundness of the scale (e.g., reliability and factor structure). I examined the factor structure for the construct of knowledge sharing behavior and hypothesized that it is multidimensional encompassing both knowledge giving and asking behavior. Additionally, I examined the factor structure of rewards for knowledge sharing. Based on the literature review, I hypothesized that there are several types of rewards (e.g., financial, affective, and relational) with differing relationships to knowledge sharing behavior. From EFA it is possible to see support for either the intrinsic-extrinsic classification of rewards or if another factor solution fits the data better. Similarly, EFA can inform the nature and measurement of KSB as possibly two distinct components: knowledge giving and knowledge asking. Lastly, regression analyses were performed to examine whether each dimension of knowledge sharing behavior is related to different dimensions of rewards.

Hypothesis 1: Knowledge sharing behavior is a multidimensional construct.

Hypothesis 2: Expected rewards for knowledge sharing is a multidimensional construct.

Rewards and knowledge sharing relationship

The idea that rewards induce desired behavior is rooted in economic theories of self-interest, stating that people evaluate the payoff when deciding whether they will or will not engage in a behavior (Ferraro, Pfeffer, & Sutton, 2005). In the context of knowledge sharing, people are likely to desire a payoff not only because they have to expend energy to communicate

their knowledge to a target but also because they must give something they have spent their time acquiring. Providing a more lucrative payoff, such as increasing the perceived benefits that may be gained from knowledge sharing, should serve to produce more of that behavior.

The payoff or reward must be sufficiently valued by an individual in order to lead to motivation. Extrinsic motivation is said to come from obtaining desired tangible resources such as pay or promotion, whereas intrinsic motivation comes from obtaining value through performing the activity itself (Lam & Lambermont-Ford, 2010 citing Deci, 1976). Intrinsic motivation can be hedonic – derived from participating in a self-determined, self-improving, or enjoyable activity. Models of job performance have depicted motivation, the degree to which one chooses to engage and persist in an effort to do something, as a proximal determinant of performance (Campbell, 1990). Research has also shown motivation's role in training participation and outcomes (Colquitt, LePine, & Noe, 2000). It is therefore likely for motivation to play a similar role in whether an individual participates in informal learning activities, such as KSB.

The three components of Vroom's (1964) VIE or expectancy theory may explain when rewards are sufficiently motivating or why rewards are motivating for certain individuals. VIE theory describes the conditions in which a person becomes more motivated to act. Motivation is theorized to be based on "expectancy" (confidence that oneself can accomplish the given activity), "instrumentality" (belief that performing an activity will lead to beneficial outcome), and "valence" (perceived attractiveness or expected satisfaction associated with the outcome). Through expectancy theory, rewards may have a theoretical basis for motivating knowledge sharing behavior. Moreover, these three factors may explain why some individuals elect to participate in knowledge sharing in response to rewards while others do not.

Overall, financial or monetary rewards (e.g., pay increase, cash bonus) are widely believed to provide extrinsic motivation. As reviewed above, there exists some empirical support for the link between rewards and KSB, and practitioner use of rewards is widespread. Cabrera et al. (2006) and Kankanhalli et al. (2005) reported positive relationships between these "extrinsic" benefits and knowledge sharing behavior, lending support for the incentivizing view of rewards. However, Liu & Fang (2010) reported no significant relationship between what they labeled as "extrinsic" motivating factors (e.g., reputation, hygiene, mutual benefit) and KSB. It appears that fun, pleasure, and a rewarding feeling gained from knowledge sharing are also motivating (Cabrera et al., 2006; Kankanhalli et al., 2005; Ozlati, 2015). These types of rewards have been labeled by researchers as intrinsic. Praise and recognition, on the other hand, have been labeled as intrinsic by some authors (e.g., Behnke, 2010) and extrinsic by others (e.g., Kankanhalli et al., 2005). Although conceptually logical that being publicly praised or recognized for good performance can be rewarding or that elevating one's reputation will lead to more willingness to engage in knowledge sharing, several studies did not find a significant relationship (e.g., Behnke, 2010; Chiu et al., 2006; Kankanhalli et al., 2005; Liu & Fang, 2010). Furthermore, Wasko and Faraj (2005) found a negative relationship between anticipated reciprocity and KSB, instead of a hypothesized positive relationship. In sum, the results are mixed.

Null findings may be due to inconsistent or contaminated operationalizations described above for rewards and KSB, or they may stem from theoretical explanations, such as the notion that different people are motivated by different things. Certain individuals may desire benefits other than financial rewards. Supervisors often rely on incentive systems, but certain workers may instead desire non-financial rewards, effective feedback, or positive leader-member exchange (LMX). Another explanation is competition. When the reward is a limited resource

(e.g., promotion) people may see each other as competitors and refrain from knowledge sharing. There is also the alternative viewpoint that rewards can hinder, rather than increase, motivation. The "undermining effect" theorizes that rewards actually impair motivation to perform (Murayama, Matsumoto, Izuma, & Matsumoto, 2010; Murayama, Kitagami, Tanaka, & Raw, 2017). The more individuals experience being controlled into doing something, the more they lose interest in wanting to do it of their own volition. Some research has shown that rewards work for simple or mechanical tasks but undermine motivation for complex tasks that require creativity or cognition (Hewett & Conway, 2016). Other research has shown the opposite effect, where motivation for a moderately complex task increases with rewards but decreases when the task is low difficulty (Cameron, Pierce, & So, 2004). Overall, it is unclear how rewards apply to knowledge sharing behavior. Rewards are commonly believed to promote knowledge sharing, but there are several issues with this assumption. Studies have found mixed results (see Table 1), operationalized rewards differently, and the measurement of knowledge sharing behavior has varied from study to study. The present study aimed to clarify the relationship between rewards and knowledge sharing behavior by testing relationships among narrower dimensions of constructs as well as examining the interaction of rewards and individual differences to explain when rewards have motivational value. I hypothesized that each dimension of rewards is positively associated with each dimension of knowledge sharing behavior.

Hypothesis 3: Non-financial rewards (e.g., getting a sense of satisfaction or rewarding feeling) exhibit a positive relationship with knowledge giving.

Hypothesis 4: Non-financial rewards (e.g., getting a sense of satisfaction or rewarding feeling) exhibit a positive relationship with knowledge asking.

Hypothesis 5: Financial rewards (e.g., pay/promotion) exhibit a positive relationship with knowledge giving.

Hypothesis 6: Financial rewards (e.g., pay/promotion) exhibit a positive relationship with knowledge asking.

Person and situation interaction

Interactions between persons and situations have been widely discussed in organizational literature across several domains, from person-environment fit theory to aptitude-treatment interactions in employee training. They underscore the importance of examining the interaction of person characteristics with situational aspects as they influence work outcomes. Nonetheless, a lack of studies have attempted to examine the interaction of person attributes and rewards in influencing knowledge sharing behavior.

Social and personality psychologists have long sought to explain the ways in which situations and personality affect behavior. Evidence of the predictive power of both types of factors has resulted in an understanding that behavior is a function of both personality and context (Cooper & Withey, 2009). Some scholars have theorized ways in which situational strength influences the relationship between personality and behavior. For example, Mischel (1977) proposed that situations are more likely to exert effects when they are strong, while personality is more likely to matter when situations are weak. However, according to a review by Cooper & Withey (2009), limited research has actually focused on empirically testing the constraining effect of situational strength on the expression of personality.

Person-situation interaction theories posit that individuals behave differently depending on their personality in a given situational context. One such theory is the cognitive affective personality system (CAPS) theory which describes individuals differing in how they focus on the

features of a situation, cognitively and emotionally encode them, and how those encodings activate other cognitions or affects (Mischel & Shoda, 1995). Generally, in the person-situation interaction view, behaviors are a reflection of if-then statements, "if A, then X, but if B, then Y" or "if A and B, then X." For example, if the situation provides a consequence for behavior (e.g., rewards), and if the person values that consequence, then motivation for performing the behavior will result. What prompts a behavioral response depends on both the particular situation as well as the person's characteristics.

In person-environment fit theory (e.g., Holland's (1985) RIASEC theory of vocational interests), individuals are only motivated to perform when environment characteristics match their personal interests, goals, or needs. Positive outcomes in job attitudes and behaviors are fostered by similarities between the employee and work environment.

In the training realm, Campbell and Kuncel (2001) have called for greater attention to aptitude-treatment interactions (ATI) due to the notion that some instructional contexts (treatments) are more or less effective for certain individuals with specific characteristics. Aptitude refers to any measurable individual characteristic, while treatment refers to any manipulatable situation variable, including characteristics of the environment. Interaction refers to an effect where optimal learning occurs when the type of instruction matches the learner. These person-situation interaction effects have been observed across educational and organizational research, suggesting that one type of treatment may not work equally well for all employees because individuals respond differently to things in the environment.

The purpose of this work was to apply the person-situation interaction framework in examining the interaction of individual characteristics (career stage and goal orientation) with contextual factors (organizational culture and rewards) in influencing knowledge sharing

behavior. Looking only at the simple relationship of rewards to outcomes ignores the issue that different people value rewards to different degrees. Rewards may or may not be influential depending on the characteristics of the person. As such, the relationship between rewards and knowledge sharing may be moderated by an individual difference, such as career stage.

Career stage

Some theories posit that workers maintain stable interests or needs and do not account for changes in workers from the time they enter the job to the time they retire. For example, Holland's (1985, 1996) RIASEC theory states that people hold a certain type of vocational interest (realistic, investigative, artistic, social, enterprising, or conventional) and gain satisfaction by working in an occupation that is congruent with their interest type. It is more plausible, however, that people do not remain static in their careers, always interested and motivated by the same things. Instead, people move through periods of development with evolving needs and desires. Career and life stage theories seek to describe this phenomenon and can be closer representations of what individuals experience over the course of their careers. Additionally, the various career concerns proposed at each career stage in these theories may help explain behaviors, such as knowledge sharing, in the workplace.

Career and life stage theories have been mostly cited in the career development and counseling literatures. Essentially, these theories say that the needs and desires of people evolve over the course of their careers, leading people to be focused on different career tasks at each developmental stage. These theories have been useful in predicting workers' goals, job satisfaction, and performance (Mount, 1984; Slocum & Cron, 1985; Smart, 1994). Two prominent theories of career development are Levinson's (1986) life cycle model and Super's

(1957, 1980) career stage model. Both posit that people progress through stages characterized by distinct developmental tasks and psychological concerns.

The life cycle model consists of nine stages separated by age brackets from 17 through 65 years of age. For example, the "entering adult world" stage spans ages 23 through 28 and represents the time period when individuals are searching for work that is consistent with their self-concept. In the "settling down" stage, which spans ages 34 to 39, individuals become more committed to their work and are interested in establishing job security and stability. Each stage is firmly determined by age, and people must progress through the stages in sequential order.

The career stage model, in contrast, is more flexible and appropriate for modern workers who commonly start delayed careers or second careers. The model theorizes four stages that employees experience over the course of their career. The four stages are not strictly linked to specific age groups; an individual can be at any of the four stages at any age. Furthermore, an individual can recycle through the four stages (i.e., go through them again or revisit a certain stage) when there is a change in career, job, or organization. According to this model, an individual can have more than one career in the course of his or her lifetime. One's career stage is determined by his or her present circumstances, perceptions, and preoccupation with certain career concerns. In contrast, Levinson's (1986) stages are strictly determined by biological age (Smart, 1994).

Super's (1957, 1980) career stage model begins with the exploration stage, where individuals are in the process of discovering their interests, where they belong, and are not yet highly committed to their occupation or organization. The second stage is termed the establishment stage where individuals have settled on an occupation and are attempting to establish themselves in their occupation. Workers in this stage are strongly concerned with

salary, promotion, success, and job security. In the maintenance stage, individuals are focused on keeping their position in the organization, maintaining their job status, performance level and knowledge in their field. Finally, in the disengagement stage, individuals "psychologically separate" from their job, begin thinking about retirement or leaving their job, and tend to seek satisfaction from outside of their job (Flaherty & Pappas, 2002). Following this theory, it may be argued that depending on current career stage, individuals will have different motivations and desires, some of which are more amenable to rewards than others.

Studies have shown support for Super's (1957, 1980) four career stages. Ornstein, Cron, and Slocum (1989) examined both life cycle and career stage theories. Based on each theory, the authors made a series of hypotheses regarding job attitudes as they relate to each of the postulated life and career stages. Overall, the authors concluded that their results support Levinson's (1986) conjectures regarding only the early stages of a career (e.g., people are less committed to the organization and less involved in the job early on), but their findings more so provide empirical support for Super's (1957, 1980) career stage theory. They observed that individuals have less positive job attitudes during the exploration stage, are more committed towards work in the establishment and maintenance stages, and are less willing to relocate for their job (i.e., less committed) as they start psychologically withdrawing in the disengagement stage.

One prevalent problem, however, has been the measurement of career stage. To date, there is no clear consensus on how career stage should be measured. Many authors using career stage theory in their studies have measured career stage as either chronological age or tenure (length of time at a job). These are straightforward operationalizations, but they are only proxies and can be inaccurate assessments of the actual construct of interest. For instance, a middle-aged

individual who wants to change careers is likely to express exploration stage needs and concerns but may be placed in the maintenance stage if assessed using age.

This has been the case for much of the research involving career stage. Researchers have frequently justified their operationalization by citing other researchers who also used proxy measures. For instance, Slocum & Cron (1985) measured career stage using age, "similar to what others have done testing Super's model." Age and tenure have continued to be popularly used as measures of career stage even in recent studies. Darcy, McCarthy, Hill and Grady (2012) examined work-life balance across four career stages separated by age groups. Lam, Ng, and Feldman (2012) examined the relationship between external job mobility and salary as it differs across career stages, measured as years of work experience. I sought to measure career stage in accordance with its theory, rather than using proxy measures. The following discussion draws upon career stage theory and expectancy (VIE) theory to describe how individuals' knowledge sharing behavior may vary as a function of the motivational value of rewards during each career stage.

During the exploration career stage, individuals are not yet committed to their job because they are still discovering what they like and excel at doing. As such, "expectancy" perceptions (confidence that oneself can accomplish the given activity) may be low. Individuals are not confident that their effort will successfully lead to performance or rewards. They may also not desire rewards, such as promotion, in a career they have not committed to yet (low "valence"). The motivational value of rewards was therefore hypothesized to be low for individuals in this career stage.

The motivational value of rewards should theoretically be the highest during the establishment stage because this is when individuals become committed to their job and are

concerned with building success in their occupation. “Expectancy” is at a high level, as is “valence” (perceived attractiveness or expected satisfaction associated with rewards). Often times being in this career stage is concurrent with the life stage of establishing a family and home. Rewards such as promotion can serve as a sign of status, power, and security in an organization, all of which are central concerns of individuals in this career stage. Accordingly, it was hypothesized that rewards have a stronger influence on knowledge sharing behavior for individuals in the establishment stage, than at other stages of career.

During the maintenance stage, workers are described as less intent on striving to achieve. Their desire for promotion is decreased and perceived “valence” of outcomes is lower. Employees in this stage have a reduced focus on advancing the career ladder and instead seek to maintain their current position within the organization. Rewards (e.g., pay or formal recognition of good performance) may still be motivating for individuals in this career stage, but not as strongly motivating as they are for individuals in the establishment stage.

Lastly, in the disengagement stage, workers are theorized to psychologically withdraw or separate themselves from their job. Behaviorally, they tend to exert minimal efforts in performance and begin pursuing satisfaction from outside of work. Individuals in this stage have been described as having ceased interest in career development. Correspondingly, interest in rewards from the job such as recognition, personal development, or promotion is likely low. It was hypothesized that rewards for knowledge sharing are much less motivating for individuals in the disengagement stage.

Hypothesis 7: Career stage moderates the relationship between financial rewards and knowledge giving.

Hypothesis 8: Career stage moderates the relationship between financial rewards and knowledge asking.

Hypothesis 9: Career stage moderates the relationship between non-financial rewards and knowledge giving.

Hypothesis 10: Career stage moderates the relationship between non-financial rewards and knowledge asking.

Goal orientations

A second antecedent variable that has received research attention in the knowledge sharing domain is goal orientation. Goal orientation is the way one interprets and behaves in learning environments and has been regarded as a stable, trait-like, individual difference variable. Goal orientation is a multidimensional construct originally conceived of as two dimensions: learning orientation and performance orientation. More recently, scholars have presented evidence for a trichotomous structure where performance orientation is further split into two components: prove/approach and avoid (Elliot & Church, 1997; Vandewalle, 1993, 1996, 1997). Overall, three distinct goal orientations have been put forth in the literature (Payne, Youngcourt, & Beaubien, 2007): learning goal orientation (focuses on task mastery and development of competence), performance prove (seeks to gain favorable judgments of competence), and performance avoid (strives to avoid perceptions of failure and incompetence).

Learning goal orientation (LGO)

Individuals with a high learning goal orientation (LGO) tend to engage in more metacognitive strategies and exert more effort in learning situations. They are inclined to seek feedback and strive to advance their development. Learning goal orientation individuals have a strong focus on the development and mastery of skills. They are concerned with *developing*

competence (Matzler & Mueller, 2011). LGO has been shown to have a positive relationship with knowledge sharing (Kim & Lee, 2013; Lee, Yoo, & Yun, 2015; Matzler & Mueller, 2011).

Hypothesis 11: Learning goal orientation exhibits a positive relationship with knowledge giving.

Hypothesis 12: Learning goal orientation exhibits a positive relationship with knowledge asking.

Performance goal orientation (PGO)

At least two studies have shown that performance goal orientation is negatively related to knowledge sharing (Kim & Lee, 2013; Matzler & Mueller, 2010); however, it is currently not well known how performance prove and performance avoid orientations are related to knowledge sharing. Performance prove goal orientation (PPO) is defined as individuals with a strong desire to prove their competence and gain favorable judgments about it from others. On the other hand, performance avoid goal orientation (PAO) is defined as the desire to avoid showing a lack of competence or the perception of incompetence. Some evidence suggests that the two components have different antecedents (Elliot & Church, 1997) and outcomes (Elliot & Harackiewicz, 1996).

Although PPO and PAO appear conceptually and empirically distinct, they have not been investigated separately in terms of relationships to knowledge giving and knowledge asking. In this study, their separate relationships were examined alongside moderators (rewards and culture) to those relationships.

Performance prove orientation (PPO)

Individuals with a performance prove orientation strive to *demonstrate* their competence to others (Vandewalle, 2003). They are concerned with gaining favorable judgments from others

regarding their competence. Generally, when one's contributions are recognized by others it can increase motivation to perform, and this may be particularly true for performance prove individuals. Accordingly, if their efforts to participate in informal learning are socially recognized within the organization, then they are more likely to engage in those efforts. However, if performance prove individuals perform knowledge sharing but no recognition is given, they will likely be unmotivated to perform those behaviors. Consequently, I hypothesized that rewards (specifically more relational types of rewards) moderate the relationship between PPO and knowledge giving.

Hypothesis 13: Performance prove orientation exhibits a positive relationship with knowledge giving.

Hypothesis 16: Non-financial rewards moderate the relationship between performance prove and knowledge giving, such that the relationship is stronger with more rewards.

Performance avoid orientation (PAO)

Individuals with a strong performance avoid orientation have a high fear of failure and strive to avoid shows of incompetence. They tend to view performance situations as threatening to the appearance of their competence (Vandewalle, 2003). Knowledge sharing situations can be threatening because by giving knowledge, others can see what you know as well as what you don't know. Given PAO individuals' desire to avoid such situations, PAO was hypothesized to have a negative relationship with knowledge giving.

Hypothesis 14: Performance avoid orientation exhibits a negative relationship with knowledge giving.

Organizational learning culture as a strong situation

Organizational culture captures the values, beliefs, and assumptions shared by employees. An organizational culture that strongly emphasizes employee learning should engender knowledge sharing behavior, even in those who are performance avoid oriented (PAO). For instance, if an organization is comprised of employees who all subscribe to the idea that learning and development are important and that participating in learning and development activities is desired organizational behavior, then behaviors consistent with those values and beliefs are likely to take place. It is reasonable to say that employees will be motivated to engage in learning behaviors, such as knowledge sharing, if they believe it is the right way to act in their organization, which is a function of the norms and signals that are interpreted from the work environment. Regardless of their own personality factors, if individuals work in a strong organizational learning culture then they are likely to act in accordance with it. This notion is grounded in the theory of situational strength.

Mischel (1977) proposed that situations are most influential when they are strong, and personality is the most influential when situations are weak. A strong situation is one where everyone knows what to do and why because the cues for desired behavior are clear, unambiguous, and potent (Cooper & Withey, 2009). Situational strength places pressure on individuals to perform certain behaviors regardless of their individual personality. Consequently, the relationship between individual personality and behavior should be attenuated in the case of a strong situation. In contrast, a weak situation has unclear demand characteristics, vague cues, and loose rules for expected behavior. These aspects allow for more unconstrained expression of personality through behavior (Prime, 2016).

This idea extends to strong organizational cultures which are defined by shared assumptions and values that homogenize or limit the variability of behavioral responses (Cooper & Withey, 2009). Culture and norms dictate consequences of desired behavior as well as behavior that is discouraged or misaligned. For instance, if knowledge sharing is a standard expectation, then those who do not share their knowledge may receive condemnation from their colleagues. In contrast, those who act in accordance with the norms gain acceptance from their peers. Learning values or norms that are strong and pervasive throughout the organization should induce knowledge sharing behavior from even those who are PAO. Consequently, it was hypothesized that strength of organizational learning culture moderates the relationship between PAO and knowledge giving. When the organization has a strong learning culture, PAO individuals will engage in more knowledge sharing behavior. Results of this investigation can provide support for the strong situation theory as well as support person-situation interaction as an organizing framework for knowledge sharing antecedents.

Hypothesis 15: Organizational learning culture moderates the relationship between PAO and knowledge giving, such that the relationship is weaker in a strong culture.

Present study

This work was conducted in two studies. The first study consisted of scale development for rewards, knowledge sharing behavior, and organizational learning culture. An item sort task with subject matter experts and exploratory factor analysis (EFA) were performed to demonstrate validity evidence for the new scales and to test hypotheses regarding the multidimensional nature of constructs. The second study consisted of confirmatory factor analysis (CFA) and used the new scales to test hypothesized relationships among dimensions of constructs as well as moderators to those relationships. The complete study procedure is depicted by the flowchart in

Figure 3. Table 2 lists hypotheses 1 - 16, and Figure 2 presents a visual summary of the hypotheses.

Chapter 2: Study 1 method

The overall goal of this work was to examine the theoretical underpinnings of knowledge sharing behavior in organizations by clarifying the measurement of constructs and antecedent relationships as identified in the introduction section.

This chapter describes the steps that were taken to develop new measurement instruments for knowledge sharing behavior, expected rewards, and organizational learning culture. These steps included content validation with subject matter experts and exploratory factor analysis to establish the dimensionality of constructs. Based on the literature review, it was hypothesized that both knowledge sharing behavior and expected rewards are multidimensional constructs.

Item content validation

It is generally advisable to write twice as many items as what is planned to be used (Cascio & Aguinis, 2011). Enough items must be written to adequately sample the domain of interest and assist in the over-determination of factors. An initial pool of items was generated for each scale under development, where the conceptual definition of the construct was used to guide item writing. Some of the items were adapted from previous scales and reworded for clarity. Additional items were written to adequately cover the construct domain based on its conceptual definition. A total of 36 items were generated for knowledge sharing behavior. Because this construct is conceptualized as consisting of both asking and giving behaviors, 18 items were written for knowledge asking, and 18 items were written for knowledge giving. Fifteen items were generated for organizational learning culture. Twenty-two items were generated for expected rewards for knowledge sharing. All items were written with the intention

of being concise, easy to understand, and not double-barreled. This initial pool of items is presented in Table 3.

According to the APA (2010) standards for testing, evidence of validity based on test content can be obtained from expert judgments about the representativeness of items. Sample size recommendations range from 12 to 30 for an item sort task (Hunt, Sparkman, & Wilcox, 1982). In this study, 14 Industrial-Organizational Psychology graduate students served as subject matter experts (SMEs) for the content validation procedure (Anderson & Gerbing, 1991). The SMEs were presented with the conceptual definition of the constructs and asked to sort each item into the construct they thought the item assessed. This process is useful for removing items that, at face value, are not conceptually consistent with the construct of interest.

For the knowledge sharing behavior (KSB) scale, four construct choices were presented to the SMEs: the behavior of giving knowledge to others, the behavior of soliciting knowledge from others, the feeling of attachment or loyalty to one's organization, and other. The feeling of attachment or loyalty to one's organization represents the construct of organizational commitment, which was included as an option because past research has shown it is a related, yet conceptually distinct, construct from knowledge sharing (Hashim & Tan, 2015).

For the organizational learning culture (OLC) scale, the construct's definition (the degree to which an organization's values and practices emphasize employee learning) was presented alongside three other construct choices: the degree to which an organization's values and practices emphasize innovation and creativity, the degree to which an organization's values and practices emphasize cohesion or unity, and other. These constructs were chosen because they are similar but distinct types of organizational culture.

For the expected rewards scale, SMEs were asked to sort each item into one of four options: the expectation of receiving a financial or tangible benefit, the expectation of receiving a social gain as an outcome, the expectation of feeling a positive emotion as an outcome, or other.

To assess evidence of validity, two indices were calculated based on results from the item sort task (Anderson & Gerbing, 1991). First, the proportion of substantive agreement (P_{sa}) represents the proportion of raters who assigned an item to its intended construct, ranging from 0.00 to 1.00. Second, the coefficient of substantive validity (C_{sv}) represents the extent to which raters assigned an item to its intended construct more than to any other construct, ranging from -1.00 to 1.00. For both, values closer to 1.00 indicate a higher degree of validity, and items with values of at least 0.75 were retained, consistent with past research and recommended guidelines (Hinkin, 1995; Anderson & Gerbing, 1991).

The initial items generated for the scales and their substantive validity indices are presented in Table 3. For KSB, the indices were above 0.75 for all items. However, four items above this threshold were not retained because based on qualitative SME feedback, several felt those items were ambiguous or double-barreled. For example, "I ask colleagues to give their ideas" and "I give my ideas at work" had indices higher than 0.75 but were not retained because some SMEs perceived "ideas" as different from the construct of knowledge. For OLC, C_{sv} indices were below 0.75 for four items which were not retained. Lastly, for expected rewards, four items had indices below 0.75 and were not retained. See Table 3 for a specification of which items were retained and which were discarded. The retained items with an index of at least 0.75 and no negative SME feedback were administered to a sample of 230 participants for exploratory factor analysis.

Measures

Organizational learning culture (Table 3). Organizational culture is defined as shared values that guide beliefs and norms for behavior in organizations (Ravasi & Schultz, 2006). Organizational culture can consist of symbols, artifacts, or aspects of the physical environment that communicate the shared values and engrained beliefs held by members within an organization. Organizational learning culture is specific to an organization's learning philosophy. It is the value an organization places on employee learning. Put another way, organizational learning culture is the organization-wide value, concern, and expectation that learning is important for employees, shown via policies and norms but is not limited to formal training (Tracey, Tannenbaum, & Kavanagh, 1995). As described above, an initial pool of 15 items was written based on this conceptual definition. After the content validation process, four items were discarded, and the remaining 11 items were presented to the study participants for exploratory factor analysis. The scale was administered using a 6-point response scale ranging from 1 (strongly disagree) to 6 (strongly agree).

Knowledge sharing behavior (Table 3). Knowledge sharing in organizations is defined as a process among colleagues involving the acquisition and provision of knowledge, which can include task information, expertise, or experience. An initial pool of 36 items was written to cover the construct space of knowledge sharing behavior, including both tacit and explicit forms of knowledge (18 items for knowledge giving and 18 items for knowledge asking). After content validation with SMEs, four items were removed. The remaining 32 items were administered on a 6-point response scale (ranging from never to always) to the sample for exploratory factor analysis.

Expected rewards (Table 3). Expected rewards is defined as a non-punitive/beneficial outcome expected to result from engaging in knowledge sharing. Existing scales for this construct have been content deficient, usually only focusing on one specific type of rewards or only rewards from knowledge giving. For example, Chiu et al.'s (2006) scale only assessed expected rewards for knowledge giving (e.g., "sharing *my* knowledge") and focused only on the expectation of making friends, feeling of happiness, building reputation, and gaining cooperation from knowledge giving. It contained no items assessing financial outcome expectations. Furthermore, KS researchers have rarely grounded their choice and labeling of rewards in theory or an established typology. In this study, an initial pool of 22 items was written to assess expected rewards for knowledge sharing, including financial, affective, and relational types of rewards. Sample items include, "exchanging knowledge with colleagues will help build friendships and alliances" and "employees will improve their chance for higher pay or a bonus if they exchange knowledge with colleagues." After content validation with SMEs, four items were removed. The remaining 18 items were adapted into two instruments: 18 items for expected rewards for knowledge giving (e.g., "giving knowledge to colleagues will help build friendships and alliances") and 18 items for expected rewards for knowledge asking (e.g., "asking colleagues for their knowledge will help build friendships and alliances"). The two instruments were administered to the study participants on a 6-point scale, ranging from strongly disagree to strongly agree.

Participants

Sample size recommendations for factor analysis range from absolute minimums (e.g., minimum N = 200) to rules of thumb, such as a minimum of six cases per variable (Cattell, 1978). More recently, researchers have recommended that minimum sample size for EFA

depends on the properties of data, such as the level of communalities and the ratio of the number of variables to factors. For instance, when there are at least three to five indicators per factor and communalities are greater than .50, then a sample size of 150 – 200 is adequate. If communalities are greater than .60, then even smaller sample sizes may be used (Fabrigar & Wegener, 2012; Worthington & Whittaker, 2006). A recent simulation study has further suggested that EFA can yield reliable results with small sample sizes (e.g., N = 50) under conditions where the data show high factor loadings, a small number of factors, and a high number of variables (de Winter, Dodou, & Wieringa, 2009).

For Study 1, participants were recruited from the University of South Florida (USF) Psychology Subject Pool (SONA), a system that allows undergraduate students to sign up and participate in research studies. Participants were required to be currently employed and at least 18 years old. Data were collected from a sample of 305 undergraduate students using Qualtrics. Sixty-four of the 305 failed the attention check, an item embedded in the survey that instructed respondents to select a certain answer to a question. Therefore, a sample size of 241 remained. After inspecting for outliers, 11 cases were excluded from further analyses given that they had a z-score greater than 3 standard deviations from the mean on any of the scales. The final sample size for factor analysis was N = 230.

The sample was predominately female (83.5%) with an average age of 21.46 (*SD* = 5.08) and a range of 18 to 60 years old. The average job tenure was 1.80 years (*SD* = 1.62). Approximately 52.2% of the sample was Caucasian, 17.4% Hispanic, 11.7% African American, 10.9% Asian, 6.1% Other, 1.3% Native Hawaiian or Pacific Islander, and 0.4% Native American. Of the 230 participants, 39.1% worked between 11 – 20 hours per week, 25.7% worked between 21 – 30 hours per week, 17.0% worked between 1 – 10 hours per week, 13.0%

worked between 31 – 40 hours per week, 3.5% worked between 41 – 50 hours per week, 1.3% worked between 51 – 60 hours per week, and 0.4% worked between 61 – 70 hours per week. These characteristics are typical of employed student samples, with the majority being female, Caucasian, and working part-time.

Exploratory factor analysis

Using Mplus, exploratory factor analyses (EFA) with maximum likelihood (ML) estimation were performed on the data collected from the sample of 230 participants. Exploratory factor analysis is a useful procedure for determining the number of latent constructs underlying a set of measured variables. ML offers the advantage of generating fit indices of the model that can aid in determining the number of factors.

In this study, dimensionality or the number of factors for each scale was inferred from a convergence of evidence based on five procedures: (1) eigenvalue-greater-than-one decision rule (2) scree plot based on eigenvalues from reduced correlation matrix (3) parallel analysis (4) model fit and (5) interpretability (Coovert & McNelis, 1988). An eigenvalue is the amount of variance explained by a factor. The eigenvalue-greater-than-one decision rule is commonly used because of its simplicity. Scree plots created from the eigenvalues of the reduced correlation matrix were used as a second source of information. Scree plots were examined for an "elbow" or inflection point as indication of the number of factors to retain. Parallel analysis is a procedure that involves comparing the obtained eigenvalues to the mean eigenvalues from simulated random data with the same sample size and number of measured variables as the real dataset. The number of obtained eigenvalues that exceed their random data counterpart suggests the appropriate number of factors. The obtained eigenvalues can be compared to the 95th percentile value of each eigenvalue if a stricter decision rule is desired. Next, model fit was examined by

referencing absolute fit indices (e.g., SRMR, RMSEA) and comparative fit indices (e.g., TLI, CFI). Absolute fit indices provide model-data correspondence. For instance, root mean square error of approximation (RMSEA) is an index of model fit that circumvents the issue of sensitivity to sample size that is an undesired property of the chi-square test of goodness of fit while simultaneously penalizing a model with extraneous degrees of freedom. An RMSEA smaller than .05 indicates close fit while values greater than .10 indicate poor fit. Values in between can be considered acceptable or mediocre fit (Fabrigar & Wegener, 2012; MacCallum, Browne, & Sugawara, 1996). RMSEA was computed and compared for each model to help determine the most appropriate model and number of factors. Standardized root mean square residual (SRMR) values less than .08 are considered good fit (Hu & Bentler, 1999). Each model's incremental fit indices, such as TLI and CFI, were also inspected to determine which model fits the data better. TLI and CFI values greater than or equal to .95 indicate good fit (Hu & Bentler, 1999). Results from these procedures were taken together rather than each in isolation to help determine the number of factors. When all procedures agree, there is strong empirical indication for the identified number of factors but is only useful if the result corresponds to a meaningful and interpretable solution based on rotated factor loadings. Interpretability is the key factor to consider. Oblique rotation (geomin) was used to estimate factor correlations, and factor loadings were examined for an interpretable solution. Items with cross-loadings (> .30) were considered for deletion because loadings on multiple factors indicate the item may not be a pure measure of any of those factors and therefore is best deleted when scale construction is the purpose (Fabrigar & Wegener, 2012). Based on an evaluation of the interpretability and conceptual sense of the factor loadings, a specific factor solution was concluded to have the best fit for each scale under development.

Chapter 3: Study 1 results

Hypothesis 1

Model 1 (32-item). Hypothesis 1 predicted that knowledge sharing behavior is a multidimensional construct. An EFA with maximum likelihood estimation and geomin (oblique) rotation was performed on 32 items in Mplus. An oblique rotation was chosen because the factors were expected to correlate to some degree.

The first goal was to determine the number of factors underlying the scale. Results revealed that two factors had eigenvalues greater than one. A scree plot showed an "elbow" between factors 2 and 3, where the first two factors exhibited large eigenvalues. To accumulate more evidence for the number of factors, parallel analysis was performed. A comparison of the obtained eigenvalues from the reduced matrix to the random eigenvalues from parallel analysis showed that only the first two obtained eigenvalues were greater than both the average and 95th percentile eigenvalues. Next, the rotated 2-factor solution produced an interpretable solution with 16 items strongly loading on factor 1 (at least .79), and another 16 items strongly loading on factor 2 (at least .72). Factor 1 reflected knowledge giving behavior while factor 2 reflected knowledge asking behavior (interfactor correlation was .45). The results of these procedures suggested a 2-factor structure. However, model fit statistics showed that a 2-factor solution accounted poorly for the correlations among measured variables (RMSEA = .10, CFI = .90, TLI = .88, SRMR = .03).

Given that model fit indices were poor for the 2-factor model, and that a 3-factor model showed items with cross-loadings (>.30), items were considered for removal from the scale. The items with cross-loadings were removed one at a time and EFA was re-run iteratively, based on recommendations by Worthington and Whittaker (2006). The following items were removed sequentially: give advice, provide expertise, impart insights, impart lessons, ask teach techniques, ask info, inform me, ask expertise, ask explain understanding, explain procedure, explain know-how, ask procedure, inform know, and request tasks information.

Final model (18-item). After removing these items, an EFA performed on the remaining 18 items resulted in a scree plot and parallel analysis suggesting two factors, acceptable model fit for the 2-factor solution (RMSEA=.06, CFI=.98, TLI=.97, SRMR=.02), and an interpretable 2-factor solution with no cross-loadings greater than .10. Furthermore, a 3-factor solution did not yield an interpretable factor structure as there were no strong loadings on the third factor. See Figure 4 for scree plot, Table 4 for model fit statistics, and Table 5 for factor loadings.

Based on the totality of evidence from these procedures, the 18 items were retained as the final measure of knowledge sharing behavior with two subscales: knowledge giving behavior and knowledge asking behavior. Nine items with high loadings on factor 1 reflected the behavior of giving tacit and explicit knowledge to colleagues (α = .96). The other nine items with high loadings on factor 2 reflected the behavior of soliciting tacit and explicit knowledge from colleagues (α = .97). Validity evidence was demonstrated by the strong factor loadings (and no cross-loadings) indicating that each item was strongly related to its intended latent construct. Furthermore, a moderate interfactor correlation of .44 coupled with acceptable fit statistics for a 2-factor solution, supported the multidimensionality of the test, consistent with the construct's definition. The 18-items together demonstrated high internal consistency reliability (α = .96).

Item-total correlations were between .66 - .79 (greater than .30), and inter-item correlations were between .28 - .85, indicating that the scale items correlated positively with each other and were representative of the same domain. In developing and validating a new measurement instrument for KSB, support was shown for hypothesis 1 that KSB is a multidimensional construct with two factors reflecting knowledge giving and knowledge asking.

Hypothesis 2

Expected rewards for knowledge giving. Model 1 (18-item). Hypothesis 2 predicted that rewards is a multidimensional construct. An EFA with maximum likelihood estimation and geomin (oblique) rotation was performed on 18 items in Mplus. Results revealed two factors with an eigenvalue greater than one. In conjunction, a scree plot and parallel analysis suggested retaining two factors. However, model fit indices for the 2-factor solution showed mediocre fit (RMSEA = .08, CFI = .93, TLI = .90, SRMR = .04). Additionally, the 3-factor solution showed the following items with cross-loadings which were removed one at a time: assignment, image, fun, cooperation, popularity, reputation, and productivity.

Expected rewards for knowledge giving. Final model (11-item). After removing the items, scree plot and parallel analysis still suggested 2 factors. Model fit was much improved (RMSEA=.05, CFI=.99, TLI=.98, SRMR=.02), with strong factor loadings for eight items on factor 1 (non-financial rewards), three items on factor 2 (financial rewards), and no substantial cross-loadings >.10. The eight items with high loadings on factor 1 were interpreted as non-financial rewards, including rewards that are affective (e.g., sense of improved confidence) and relational in nature (e.g., friendships or alliances). The other three items had high loadings on factor 2 and reflected financial rewards such as higher pay, perks/prizes, and promotion. Furthermore, the 3-factor solution did not yield an interpretable factor structure as there were no

strong loadings on the third factor. Based on the evidence from these procedures, 11 items were retained as the final measure of expected rewards for knowledge giving. Evidence of validity was shown via the high loadings that items had on their latent construct as well as acceptable fit statistics for a 2-factor solution (with an interfactor correlation of .52), suggesting that the test is multidimensional and consistent with the construct's definition. See Figure 6 for scree plot, Table 8 for model fit statistics, and Table 9 for factor loadings. The final 8-items for non-financial rewards demonstrated adequate internal consistency reliability ($\alpha = .91$), as did the final 3-items for financial rewards ($\alpha = .84$). The 11-items together demonstrated high internal consistency reliability ($\alpha = .90$), item-total correlations between .52 - .79 (greater than .30), and inter-item correlations between .22 - .76, suggesting that the items reflected the same construct domain.

Expected rewards for knowledge asking. Model 1 (18-item). An EFA with maximum likelihood estimation and geomin (oblique) rotation was performed on 18 items in Mplus. Results revealed two factors with an eigenvalue greater than one. Similarly, the scree plot and parallel analysis both suggested retaining two factors. Next, model fit was examined for the 2-factor solution revealing poor fit (RMSEA = .11, CFI = .90, TLI = .86, SRMR = .05). Additionally, the 3-factor solution showed the following items with cross-loadings which were removed one at a time: popularity, cooperation, image, assignment, reputation, productivity, accomplishment, reduce error, and fun.

Expected rewards for knowledge asking. Final model (9-item). After removal of these items, the scree plot and parallel analysis suggested two factors, and the 2-factor model demonstrated acceptable fit (RMSEA=.06, CFI=.99, TLI=.98, SRMR=.02). There were strong factor loadings for six items on factor 1 (non-financial rewards) and three items on factor 2

(financial rewards), with simple structure and no substantial cross-loadings. The six items that loaded strongly on factor 1 reflected non-financial rewards for soliciting knowledge, including rewards that are affective (e.g., sense of improved confidence) and relational (e.g., friendships or alliances). The other three items loaded strongly on a separate factor reflecting financial rewards for soliciting knowledge, such as higher pay, perks/prizes, and promotion. Lastly, a 3-factor solution did not yield an interpretable factor structure. Based on the evidence from these procedures, the nine items were retained as the final measure of expected rewards for knowledge asking. Evidence of validity was demonstrated via the high factor loadings of items on their latent construct, acceptable fit statistics for a two-factor solution, and a moderate interfactor correlation of .49. See Figure 7 for scree plot, Table 10 for model fit statistics, and Table 11 for factor loadings. The final 6-items for non-financial rewards for knowledge asking behavior demonstrated adequate internal consistency reliability ($\alpha = .92$), as did the 3-items for financial rewards ($\alpha = .84$). The 9-items together demonstrated adequate reliability ($\alpha = .89$), item-total correlations between .56 - .76, and inter-item correlations between .24 - .82, indicating that the items were representative of the same construct domain.

Overall, these results supported hypothesis 2 that expected rewards is a multidimensional construct. Results showed both rewards for knowledge giving and rewards for knowledge asking are multidimensional in nature with two factors: financial rewards and non-financial rewards.

Organizational learning culture

Organizational learning culture. Model 1 (11-item). An EFA with maximum likelihood estimation and geomin (oblique) rotation was performed on 11 items in Mplus. Results revealed one factor with an eigenvalue greater than one. The scree plot and parallel analysis also suggested retaining one factor. Model fit for the 1-factor solution, however, was not acceptable

(RMSEA = .17, CFI = .86, TLI = .82, SRMR = .06). The 1-factor solution was interpretable with factor loadings ranging from .74 to .88 for all 11 items. The 2-factor and 3-factor solutions were not interpretable and showed items with cross-loadings (> .30). Items with cross-loadings were removed one at a time and EFA with geomin rotation was re-run iteratively. In total, the following items were removed: performance evaluation, norm, supportive, learning is important, and value.

Organizational learning culture. Model 1 (6-item). After removing these items, results from the scree plot and parallel analysis suggested one factor. Model fit for the 1-factor model was acceptable (RMSEA=.06, CFI=.99, TLI=.98, SRMR=.03). All six items loaded strongly on a single interpretable factor, demonstrating the unidimensionality of the scale. See Figure 5 for scree plot, Table 6 for model fit statistics, and Table 7 for factor loadings. The six items were retained as the final measure of OLC and demonstrated adequate internal consistency reliability (α = .88), item-total correlations between .53 - .83, and inter-item correlations between .36 - .77, indicating that the items were representative of the same construct domain.

Interfactor correlations

Evidence of convergent and discriminant validity, respectively, can be obtained if the indicators of a factor have a strong relationship to their latent construct (i.e., high factor loadings that do not cross-load) and if the relationship between distinct factors is small to moderate. For each subscale in this study, the high factor loadings and lack of cross-loadings indicated that the underlying factor strongly influences its set of items, and those items (which are intended to measure the same construct) are inter-correlated more strongly than with items measuring a different construct.

By nature, factors can be expected to correlate to some degree (hence why oblique rotation was performed in this study). When two factors are very highly correlated (close to + or -1), this shows poor discriminant validity (Campbell & Fiske, 1959; Cabrera-Nguyen, 2010, Widaman, 1985). If the subscales measure conceptually distinct dimensions of KSB and rewards, then discriminant validity should be evident by small to moderate interfactor correlations. The interfactor correlations in Study 1 ranged from .44 to .52, evincing discriminant validity. For instance, knowledge giving and knowledge asking were correlated .44, which is expected because it is plausible for a person with high knowledge giving behavior to also exhibit high knowledge asking behavior; some people share knowledge in both ways (giving and asking). The moderate correlation suggested that the two types of behavior are related and tapping into the same construct domain (i.e., knowledge sharing behavior), yet because the correlation strength was not as high as .80, each factor represents a unique aspect of the knowledge sharing construct domain. Similarly, for expected rewards, non-financial and financial rewards for knowledge asking correlated .49, while non-financial and financial rewards for knowledge giving correlated .52. Again, the interfactor correlations were not so high such that the factors are redundant. Instead, they suggested that each factor represents a correlated yet distinct dimension of rewards.

Overall, Study 1 sought to clarify the factor structure of knowledge sharing behavior and expected rewards. The results supported the hypothesized multidimensional nature of both constructs. Additionally, the results provided preliminary validity evidence for new instruments designed to measure the constructs of knowledge sharing behavior, expected rewards, and organizational learning culture.

Chapter 4: Study 2 method

The goal of Study 2 was to use the validated scales to clarify the nature of the relationship between rewards and knowledge sharing behavior as well as the relationship between goal orientation and knowledge sharing behavior. This chapter details the steps that were taken to test hypotheses 3 – 16.

Participants

Participants for Study 2 were obtained in three ways: through the University of South Florida (USF) Psychology Subject Pool, Amazon Mechanical Turk (MTurk) – a service that connects researchers to workers who complete surveys, and by emailing department heads of organizations around the United States to invite them to participate in the study. Publicly available email addresses of administrative department heads from universities across the U.S. were compiled, and emails were sent requesting that they forward the study flyer to their department members for voluntary participation. Any employees interested in participating could directly access the survey link provided in the study flyer. To be included in the study, participants must have indicated they are adults currently working in a setting that allows for interaction or communication with colleagues. Participants were informed about the study procedure (i.e., completing a set of anonymous surveys online), that their participation is voluntary, and that their data will be used for research purposes only. Participants from MTurk were each compensated $1.20 for completing the study.

Student samples have been criticized for having limited generalizability to the general working population. Therefore, an effort was made in this study to recruit from multiple sources to supplement a student sample. Data were collected from 638 employed students from the USF Subject Pool, 77 employees from organizations around the United States, and 25 MTurk workers, yielding a total of 740 participants. Of these, 37 cases did not finish the survey, so their data were excluded. Of the remaining, 134 failed the attention check item so their data were excluded. The final sample size was N = 569.

The average age of the 569 participants was 24.05 years old (*SD* = 9.32). Ethnicity of the sample was 52.7% White, 21.3% Hispanic, 9.8% Asian, 9.7% Black, and 6.5% who selected other. Participants were 75.7% female, 23.9% male, and 0.4% who selected other. The average organization tenure was 2.71 years (*SD* = 4.16). The average career tenure was 3.68 years (*SD* = 5.98). In a typical work week, 48.3% worked between 15-29 hours per week, 24.3% of the sample worked between 1-14 hours per week, 21.8% worked between 30-44 hours per week, and lastly, 5.6% of the sample worked 45 hours or more per week. Participants were sampled across a variety of occupations, such as sales representatives, office clerks or receptionists, education administrators, human resources managers, and physical therapists.

One-way ANOVAs were performed to compare the three subsamples on the study variables. Significant differences were found between (1) the student and field subsamples on KA behavior (2) the MTurk and field subsamples on KA non-financial rewards (3) the student and MTurk subsamples on PPO. Pooled within-group correlations, which remove the effects of group differences in means, were compared to the zero-order correlations. The pattern of correlations was practically identical to the zero-order correlations presented in Table 13, where KA and KG were moderately correlated (.51), the four types of rewards were inter-correlated

(.34 – .77), correlations between rewards and KG were small (.03 – .08), while correlations between rewards and KA were larger (.14 – .20), LGO correlated with both KG (.16) and KA (.18), PPO was uncorrelated with KG (-.02) and KA (.05), and PAO was negatively correlated with both KG (-.26) and KA (-.17). In conclusion, the zero-order correlations did not appear to have been substantially affected by subsample differences.

Measures

Demographics. Participants were surveyed regarding their age, gender, ethnicity, tenure, and occupation.

Attention check. One attention check item was embedded within the survey. Participants were told "as an attention check please select strongly disagree for your answer to this question." Survey data from participants who gave a response other than strongly disagree were excluded from the analyses.

Knowledge sharing behavior (Table 5). The 18-item instrument with two 9-item subscales reflecting knowledge giving and knowledge asking was used to assess the extent to which individuals engaged in knowledge sharing behavior. Reliability for the knowledge giving subscale was $\alpha = .97$ and reliability for the knowledge asking subscale was $\alpha = .97$. The instrument was administered on a 6-point response scale ranging from 1 (never) to 6 (always).

Organizational learning culture (Table 7). The 6-item instrument developed in Study 1 was used to assess individual perception of the degree to which their organization values employee learning. Reliability was $\alpha = .77$. The instrument was administered using a 6-point response scale ranging from 1 (strongly disagree) to 6 (strongly agree).

Expected rewards for knowledge giving (Table 9). The 11-item instrument was used to measure expected financial (3 items) and non-financial rewards (8 items) for knowledge giving.

Reliability for the financial rewards subscale was α = .83 and reliability for the non-financial rewards subscale was α = .86. The instrument was administered using a 6-point response scale ranging from 1 (strongly disagree) to 6 (strongly agree).

Expected rewards for knowledge asking (Table 11). The 9-item instrument was used to measure expected financial (3 items) and non-financial rewards (6 items) for knowledge asking. Reliability for the financial rewards subscale was α = .87 and reliability for non-financial rewards subscale was α = .86. The instrument was administered on a 6-point response scale ranging from 1 (strongly disagree) to 6 (strongly agree).

Goal orientation. Vandewalle's (1997) 13-item instrument for goal orientation developed specifically for work settings was used to measure learning goal orientation (LGO), performance avoid orientation (PAO), and performance prove orientation (PPO). Previous studies have reported acceptable reliability and factor analytic evidence of validity, where factor loadings exceeded the .60 recommended level and the three-factor model fit the data better than alternative factor solutions (McKinney, 2003). In this study, the internal consistency reliability for five LGO items was α = .85, for four PAO items α = .87, and for four PPO items α = .69.

Career stage. To assess individual career stage, four response options were presented to participants reflecting the exploration, establishment, maintenance, and disengagement stages of career. Participants were asked to self-identify the option that best reflected them in the present moment of their career. The four response options were adapted from Flaherty & Pappas' (2002) career stage self-selection measure. The authors state that the self-selection method has advantages over Likert scales, such as resulting in a categorical measure of career stage and helping to increase response rate due to its short length. Minor changes were made in the wording of the original items to more clearly reflect each of the four career stages theorized by

Super (1957) as well as to better suit modern times where having multiple careers is becoming increasingly common.

A second measure of career stage was included in this study, consisting of Likert-type rating scale items adapted from Super, Thompson, and Lindeman's (1988) Adult Career Concerns Inventory (ACCI) and Perrone, Gordon, Fitch, & Civiletto's (2003) ACCI-Short Form. The ACCI assesses career concerns and tasks that reflect the four stages of career development. The wording of items was slightly modified to be unambiguous and clearly representative of each career stage's conceptual definition. Participants were asked to rate their concern with issues, such as "finding the career I am best suited for" and "establishing trust with my current employer, colleagues, or clients," on a scale of 1 (very low concern) to 6 (very high concern). After scoring the responses, 116 cases had scores indicating more than one career stage as their highest. Therefore, these cases were excluded, leaving a sample size of N = 453. Reliability for the three exploration stage items was $\alpha = .98$, for the four establishment items $\alpha = .85$, for the three maintenance items $\alpha = .70$, and for the three disengagement items $\alpha = .90$.

Chapter 5: Study 2 results

Confirmatory factor analysis

To provide validity evidence for the scales developed in Study 1, confirmatory factor analyses (CFA) were performed in Mplus using Study 2's sample (N = 569). MacCallum et al. (1996) established that the minimum sample size for adequate power to test hypotheses of model fit may be estimated based on the degrees of freedom (df) of a model. Degrees of freedom can be calculated when the researcher knows the number of free parameters that are to be estimated. Generally, when df is large, then a moderate sample size can produce an adequately powerful test of fit. Given the degrees of freedom for the CFA models in this study (reported below and in Table 27), a sample size of N = 569 was adequate for .80 power. The only exception was for the 1-factor model of OLC, where df = 9, suggesting a sample size of over 750 would be necessary to achieve .80 power (MacCallum et al., 1996). Two factors were hypothesized for knowledge sharing behavior (9 items for knowledge giving and 9 items for knowledge asking), with results indicating acceptable fit (χ^2 = 714.69, df = 134, p = .00, RMSEA = .087 [.081, .094], CFI = .95, TLI = .94, SRMR = .034). A CFA that specified one factor for organizational learning culture (6 items) indicated marginal fit (χ^2 = 54.15, df = 9, p = .00, RMSEA = .094 [.071, .119], CFI = .94, TLI = .91, SRMR = .038). Two factors were hypothesized for knowledge giving rewards (8 items for non-financial and 3 items for financial rewards), with results indicating acceptable fit (χ^2 = 161.23, df = 43, p = .00, RMSEA = .070 [.058, .081], CFI = .95, TLI = .94, SRMR = .036). Lastly, results demonstrated good fit for a two-factor model for knowledge asking rewards (6 items for non-financial and 3 items for financial rewards), χ^2 = 61.27, df = 26, p = .00, RMSEA

= .049 [.033, .065], CFI = .99, TLI = .98, SRMR = .033. Table 27 presents a summary of these results.

The interfactor correlations pointed to the same conclusions as those from Study 1. That is, the interfactor correlations were moderate enough to suggest that the two dimensions of a construct are related, but they were not as high as .80, therefore suggesting that each they capture a unique part of the construct domain. More specifically, knowledge giving and asking behaviors were correlated .53. Non-financial and financial rewards for knowledge asking correlated .46, while non-financial and financial rewards for knowledge giving correlated .45.

Multiple regression assumptions

Multiple regression (MR) assumes that variables have normal distributions. Substantial skewness is marked by skewness values greater than or less than one. There was evidence of skewness for learning goal orientation (-1.01), non-financial rewards for knowledge giving (-1.48), and non-financial rewards for knowledge asking (-1.36; see Table 12). These variables appeared to be negatively skewed. The Q-Q plots for these three variables also suggested that they were skewed. In regression, however, moderate to substantial departures from normality can be tolerable (Howell, 2010).

Next, plotting standardized residuals against predicted values did not show evidence of heteroscedasticity. Multiple regression also assumes that independent variables are not highly correlated with each other. Multicollinearity may be indicated by variance inflation factor (VIF) values greater than 10 and tolerance values less than 0.10. In this study, VIF was greater than 10 for performance avoid orientation (PAO; VIF = 17.33) and for its product term with organizational learning culture (culture x PAO; VIF = 22.82), suggesting multicollinearity. The two variables were also highly correlated (r = .86, p < .01). Once the interaction term was

centered, VIF and tolerance values became acceptable. Similarly, VIF was greater than 10 for performance prove orientation (PPO; VIF = 27.36), non-financial rewards for knowledge giving (VIF = 11.23), and their product term (VIF = 43.85). However, once the product term (non-financial rewards x PPO) was centered, VIF and tolerance values were acceptable.

Lastly, influential outliers were examined using Cook's Distance. According to Howell (2010), there is no clear cutoff, but Cook's D values greater than 1.00 are considered unusual and should be examined more closely. When knowledge giving and knowledge asking were regressed on study predictors, Cook's D values were close to zero and did not suggest unusual or influential outlier points.

Descriptive statistics

The descriptive statistics for each study variable are presented in Table 12. Scale reliabilities ranged from .69 to .98 and are presented in Table 13. In general, scales showed adequate reliability in accordance with the .70 standard for Cronbach's alpha (Nunnally, 1978). The only scale with reliability below this standard was performance prove orientation ($\alpha = .69$).

A correlation matrix of study variables is presented in Table 13. Demographic variables: age, organization tenure, and career tenure showed significant correlations with knowledge giving behavior, financial rewards, goal orientations (PAO, PPO) and career stage. Age and tenure have also been theoretically linked to career stage and commonly used as proxies for career stage. As such, these variables were included as controls in subsequent MR analyses described below. It is possible for these variables to explain the relationships among the main variables of interest. For instance, hypotheses 11 – 14 proposed that goal orientations are associated with KSB. However, an alternative might be that the relationships are driven by age or tenure. As suggested by the correlation matrix, individuals high in age/tenure tend to report

lower PAO while they also tend to report more KSB; as people have longer tenure, they may grow more comfortable in performance situations at work while also having more experience and knowledge to share. Thus, age or tenure might account for an observed relationship between PAO and KSB. MR analyses were performed with and without the inclusion of these control variables, revealing no impact on the results. Therefore, the observed relationships among this study's focal variables were likely not driven spuriously by age and tenure. A summary of this study's findings (i.e., hypothesis testing results) is presented in Table 26 and Figure 10.

Hypotheses 3 – 6

The EFA and CFA results reported above demonstrated two types of rewards for knowledge sharing: financial rewards and non-financial rewards. Hypotheses 3 and 4 proposed that non-financial types of rewards (e.g., rewarding feelings from knowledge sharing) are positively related to knowledge giving and knowledge asking behavior. Hypotheses 5 and 6 predicted that financial types of rewards (e.g., pay or promotion) are positively related to knowledge giving and knowledge asking behavior.

The correlation matrix in Table 13 shows that knowledge asking demonstrated positive zero-order correlations with both types of rewards. In contrast, knowledge giving was not significantly correlated with either type of rewards. To further test hypotheses 3 and 5 (i.e., rewards are positively related to knowledge giving), hierarchical multiple regression was performed with knowledge giving as the dependent variable. In step 1 age, organizational tenure, and career tenure were entered as controls. In step 2 financial rewards and non-financial rewards were added to the model (see Table 14). The model with rewards was statistically significant in predicting knowledge giving behavior, $R^2 = .04$, $F(5, 563) = 4.96$, $p < .01$. However, adding rewards did not result in a significant increase in prediction, $\Delta R^2 = .00$, $p = 27$. Additionally, the

beta coefficient was not significant for financial rewards (β = .02, t(563) = .43, p = .67) nor for non-financial rewards (β = .06, t(563) = 1.28, p = .20). Therefore, hypotheses 3 and 5 were not supported. This study did not find support for the relationship between expected rewards and knowledge giving behavior.

To further test hypotheses 4 and 6 (i.e., rewards are positively related to knowledge asking), multiple regression was performed with knowledge asking behavior as the dependent variable. In step 1 age, organizational tenure, and career tenure were entered as controls. In step 2 financial rewards and non-financial rewards were entered (see Table 15). The model was statistically significant in predicting knowledge asking behavior, R^2 = .06, F(5, 563) = 7.08, p < .01. Adding both rewards to the model resulted in a significant increase in prediction, ΔR^2 = .06, p < .01. The regression coefficient was also significant for both financial rewards (β = .12, t(563) = 2.61, p < .01) and non-financial rewards (β = .16, t(563) = 3.54, p < .01). Therefore, hypotheses 4 and 6 were supported. Both financial (e.g., pay, promotion) and non-financial (e.g., feeling a sense of satisfaction, fulfillment, friendship) types of rewards were positively related to knowledge asking behavior. See Table 15 for the regression results.

Hypotheses 7 – 10

Hypothesis 7 predicted that career stage moderates the relationship between financial rewards and knowledge giving. A regression analysis was performed with knowledge giving as the dependent variable (see Table 18). In step 1 control variables (age, organizational tenure, and career tenure) were added. In step 2 financial rewards for knowledge giving and each of the dummy coded career stages with exploration as the reference group were added. In step 3 interaction terms for financial rewards and each of the dummy coded career stages were added. Results showed that the full regression model was significant, F(10,558) = 2.84, p < .05, but

adding interaction terms to the model did not improve prediction $\Delta R^2 = .01$, $p = .24$, and none of the interaction terms representing slope differences were significant. Next, the same regression was performed with career stage successively re-coded with establishment, maintenance, and disengagement as the reference groups. Again, none of the interaction terms were significant, altogether suggesting that there were no significant differences in slope for any pair of career stages.

More specifically, the slope for each career stage was: exploration ($b = -.00$, $p = .99$), establishment ($b = -.35$, $p = .31$), maintenance ($b = .02$, $p = .95$), and disengagement ($b = .38$, $p = .05$). Results indicated the slopes for exploration and establishment were not significantly different, $b = -.35$, $t(558) = -.88$, $p = .38$. The slopes for exploration and maintenance were not significantly different, $b = .02$, $t(558) = .06$, $p = .96$. The slopes for exploration and disengagement were not significantly different, $b = .39$, $t(558) = 1.42$, $p = .16$. The slopes for establishment and maintenance were not significantly different, $b = .37$, $t(558) = .82$, $p = .42$. The slopes for establishment and disengagement were not significantly different, $b = .73$, $t(558) = 1.86$, $p = .06$. Lastly, the slopes for maintenance and disengagement were not significantly different, $b = .37$, $t(558) = -1.05$, $p = .30$. Together these findings suggested that the relationship between financial rewards and knowledge giving is not significantly different across the four career stages, and hypothesis 7 was not supported.

Hypothesis 8 predicted that career stage moderates the relationship between financial rewards and knowledge asking. A regression analysis was performed with knowledge asking regressed on control variables, financial rewards, each of the dummy coded career stages with exploration as the reference group, and the interaction terms for financial rewards with each of the dummy coded career stages (see Table 19). Results showed that the full regression model

was significant, $F(10,558) = 4.02$, $p < .01$, but adding interaction terms to the model did not improve prediction, $\Delta R^2 = .00$, $p = .58$. Furthermore, none of the interaction terms representing slope differences were significant. When career stage was successively re-coded with establishment, maintenance, and disengagement as the reference group, none of the interaction terms were significant, indicating there were no significant differences for any pair of slopes. The slope for each career stage was: exploration ($b = .29$, $p = .13$), establishment ($b = .45$, $p = .17$), maintenance ($b = .37$, $p = .19$), and disengagement ($b = .67$, $p < .01$). More specifically, the slopes for exploration and establishment were not significantly different, $b = .16$, $t(558) = .43$, $p = .67$. The slopes for exploration and maintenance were not significantly different, $b = .08$, $t(558) = .25$, $p = .81$. The slopes for exploration and disengagement were not significantly different, $b = .38$, $t(558) = 1.38$, $p = .17$. The slopes for establishment and maintenance were not significantly different, $b = -.08$, $t(558) = -.18$, $p = .86$. The slopes for establishment and disengagement were not significantly different, $b = .22$, $t(558) = .57$, $p = .57$. Lastly, the slopes for maintenance and disengagement were not significantly different, $b = .30$, $t(558) = .85$, $p = .40$. Together these findings suggested that the relationship between financial rewards and knowledge asking behavior is not significantly different across the four career stages. Hypothesis 8 was not supported.

Hypothesis 9 predicted that career stage moderates the relationship between non-financial rewards and knowledge giving. A regression analysis was performed with knowledge giving regressed on control variables, non-financial rewards, each of the dummy coded career stages with exploration as the reference group, as well as the interaction terms for non-financial rewards with each of the dummy coded career stages (see Table 20). Results showed that adding interaction terms to the model significantly improved prediction, $\Delta R^2 = .03$, $p < .01$, $F(10,558) =$

4.11, $p < .01$. Additionally, the regression coefficient for the interaction between non-financial rewards and dummy 3 was significant, indicating that the slopes for exploration ($b = -.11$, $p = .38$) and disengagement ($b = .46$, $p < .01$) were significantly different, $b = .57$, $t(558) = 3.29$, $p < .01$. When career stage was re-coded with establishment as the reference group, the same interaction term was significant, indicating that the slopes for establishment ($b = -.13$, $p = .54$) and disengagement ($b = .46$, $p < .01$) were significantly different, $b = .59$, $t(558) = 2.40$, $p < .05$. Lastly, when career stage was re-coded with maintenance as the reference group, the same interaction term was significant, indicating that the slopes for maintenance ($b = -.16$, $p = .45$) and disengagement ($b = .46$, $p < .01$) were significantly different, $b = .62$, $t(558) = 2.52$, $p < .05$.

Altogether, these results suggested that the relationship between non-financial rewards and knowledge giving is different for disengagement stage compared to the other three career stages. A scatterplot in Figure 8 shows that the relationship between non-financial rewards and knowledge giving has a slight negative, although non-significant, trend in exploration ($b = -.11$, $p = .38$), establishment ($b = -.13$, $p = .54$), and maintenance ($b = -.16$, $p = .45$) career stages. In comparison, the slope for disengagement stage is positive and statistically significant ($b = .46$, $p < .01$). These results supported the study's hypothesis that career stage is a moderator of the relationship between non-financial rewards and knowledge giving, however, not in the theorized way. Therefore hypothesis 9 was only partially supported.

Hypothesis 10 predicted that career stage moderates the relationship between non-financial rewards and knowledge asking. Knowledge asking was regressed on control variables, non-financial rewards, each of the dummy coded career stages with exploration as the reference group, and the interaction terms for non-financial rewards and each of the dummy coded career stages (see Table 21). Results showed that the full regression model was significant, $F(10,558) =$

4.98, $p < .01$, but adding interaction terms to the model did not significantly improve prediction, $\Delta R^2 = .01$, $p = .40$. Moreover, none of the interaction terms representing slope differences were significant. When career stage was successively re-coded with establishment and maintenance as the reference group, none of the interaction terms were significant, indicating that none of the slopes were significantly different from each other.

The slope for each career stage was: exploration ($b = .43$, $p < .05$), establishment ($b = .50$, $p = .06$), maintenance ($b = .14$, $p = .52$), and disengagement ($b = .58$, $p < .01$). The lack of significant interaction terms indicated that the slopes were not significantly different across career stages. Exploration and establishment were not significantly different, $b = .07$, $t(558) = .21$, $p = .84$. The slopes for exploration and maintenance were not significantly different, $b = -.29$, $t(558) = -1.04$, $p = .30$. The slopes for exploration and disengagement were not significantly different, $b = .15$, $t(558) = .68$, $p = .50$. The slopes for establishment and maintenance were not significantly different, $b = -.36$, $t(558) = -1.04$, $p = .30$. The slopes for establishment and disengagement were not significantly different, $b = .09$, $t(558) = .28$, $p = .78$. And lastly, the slopes for maintenance and disengagement were not significantly different, $b = .44$, $t(558) = 1.71$, $p = .09$. Together these findings suggested that the relationship between non-financial rewards and knowledge asking behavior is not significantly different across the four career stages. Hypothesis 10 was not supported.

The same regression analyses were performed with career stage measured using the Likert-type rating scale adapted from ACCI items. Results using this instrument were generally the same as the results reported above (when career stage was measured with the self-select instrument). More specifically, hypothesis 7 was not supported – adding interaction terms did not significantly improve prediction, $\Delta R^2 = .00$, $p = .99$, and regression coefficients for the

interaction terms were non-significant suggesting that the relationship between financial rewards and knowledge giving does not significantly differ across the four career stages when measured using the Likert instrument (ACCI items). Likewise, hypothesis 8 was not supported – interaction terms did not significantly add to prediction, $\Delta R^2 = .01$, $p = .37$, and coefficients for the interaction terms were non-significant, suggesting that the relationship between financial rewards and knowledge asking does not differ across the four career stages. For hypothesis 9, exploration and establishment were significantly different from disengagement stage, similar to the results when career stage was measured using the self-select instrument. The only dissimilarity in results was that maintenance stage did not reach a statistically significant difference from disengagement stage, $b = .67$, $t(442) = 1.68$, $p = .09$, when measured using the Likert scale (ACCI items). However, the pattern of slopes was similar between the Likert measure and the self-select career stage measure, where the slopes for exploration ($b = -.26$, $p = .12$), establishment ($b = -.20$, $p = .13$), and maintenance ($b = -.01$, $p = .99$) were non-significant, while the slope for disengagement was positive and significant ($b = .66$, $p < .01$). Lastly, for hypothesis 10, the interaction terms did not contribute to prediction, $\Delta R^2 = .00$, $p = .91$, and the regression coefficients for all interaction terms were non-significant, suggesting that the relationship between non-financial rewards and knowledge asking is not different between any of the four career stages, similar to the results when career stage was measured using the self-select instrument (see Tables 22 - 25).

Hypotheses 11 – 14

Hypotheses 11 and 12 predicted that learning goal orientation (LGO) is positively related to both knowledge giving and knowledge asking, consistent with previous studies that found a positive relationship between LGO and knowledge sharing (e.g., Kim & Lee, 2013; Lee et al.,

2015; Matzler & Mueller, 2011). The correlation matrix in Table 13 showed a positive zero-order correlation between LGO and knowledge giving (r =.16, p < .01) as well as between LGO and knowledge asking (r = .18, p < .01). MR analysis was performed with controls in step 1, followed by financial and non-financial rewards in step 2. Adding LGO to the regression model in step 3 revealed a significant increase in prediction for knowledge giving, ΔR^2 = .02, p < .01, and for knowledge asking, ΔR^2 = .01, p < .01. The model explained a significant proportion of variance in knowledge giving, R^2 = .06, F(6,562) = 6.21, p < .01, and in knowledge asking, R^2 = .07, F(6,562) = 7.17, p < .01. Moreover, the regression coefficient for LGO was significant in predicting knowledge giving (β = .15, t(562) = 3.46, p < .01) and knowledge asking (β = .12, t(562) = 2.68, p < .01). Therefore hypotheses 11 and 12 were supported. Results are presented in Table 14 for knowledge giving and Table 15 for knowledge asking.

Hypothesis 13 predicted that performance prove orientation (PPO) exhibits a positive relationship with knowledge giving. Results did not support this hypothesis (see Tables 14 and 15). First, there was no significant zero-order correlation from PPO to knowledge giving (r = -.03, p = .55) or knowledge asking (r = .05, p = .27). Second, adding PPO to the regression did not produce a significant increase in the prediction of knowledge giving, ΔR^2 = .00, p = .23, or knowledge asking, ΔR^2 = .00, p = .44. Third, the regression coefficient was not significant for knowledge giving (β = -.05, t(561) = -1.21, p = .23) or for knowledge asking (β = -.03, t(561) = -.77, p = .44). Moreover, when PPO was the only predictor in the regression model, it remained non-significant in predicting knowledge giving R^2 = .00, F(1,567) = .36, p = .55, where β = -.03, t(567) = -.60, p = .55. It also remained non-significant in predicting knowledge asking R^2 = .00, F(1,567) = 1.24, p = .27, where β = .05, t(567) = 1.11, p = .27.

Hypothesis 14 predicted that performance avoid orientation (PAO) exhibits a negative relationship with knowledge giving. Results supported hypothesis 14 and additionally suggested a negative relationship with knowledge asking. First, PAO exhibited significant negative zero-order correlations with both knowledge giving (r = -.26, p < .01) and knowledge asking (r = -.17, p < .01). Adding PAO to the regression model in step 5 revealed a significant improvement in prediction for knowledge giving, ΔR^2 = .05, p < .01, and a significant improvement in prediction for knowledge asking, ΔR^2 = .03, p < .01. The regression model with PAO in the set of predictors explained a significant proportion of variance in knowledge giving R^2 = .12, F(8,560) = 9.20, p < .01, and knowledge asking R^2 = .11, F(8,560) = 8.19, p < .01. The PAO regression coefficient was significant for predicting knowledge giving (β = -.25, t(560) = -5.72, p < .01), and knowledge asking (β = -.20, t(560) = -4.52, p < .01). These results supported the hypothesis that individuals with a high performance avoid orientation tend to engage in less knowledge sharing behavior. Together, the findings for hypotheses 11 – 14 indicated that different dimensions of goal orientation relate differently to knowledge sharing behavior. See Tables 14 and 15 for the analyses.

Hypotheses 15 – 16

This study sought to examine the moderating effect of organizational learning culture on the relationship between performance avoid orientation (PAO) and knowledge giving behavior. Hypothesis 15 predicted that PAO would have a weaker relationship with knowledge giving in a strong organizational learning culture.

First, both PAO (r = .86, p < .01) and organizational learning culture (r = .50, p < .01) were correlated with their product term. To address multicollinearity, the variables were mean centered. After centering, the correlations among predictors became non-significant. Next, PAO,

organizational learning culture, and their centered interaction term were entered into the regression model to test for moderation (see Table 16). Results showed that the full model with the interaction term was significant in predicting knowledge giving behavior, $R^2 = .11$, $F(6,562) = 11.47$, $p < .01$ and produced a significant increase in $\Delta R^2 = .01$, $p < .01$. The coefficient for the interaction term was also significant ($\beta = .11$, $t(562) = 2.76$, $p < .01$), providing support for the moderating effect of organizational learning culture.

See Figure 9 for a plot of the moderating effect (i.e., knowledge giving behavior as a function of PAO for different levels of organizational leaning culture), showing that in a high organizational learning culture, the relationship between PAO and knowledge giving is weaker (simple slopes analysis reveals that $b = -.28$, $\beta = -.13$, $t(562) = -2.35$, $p < .05$), while in a low organizational learning culture, the relationship between PAO and knowledge giving is stronger (simple slopes analysis reveals that $b = -.71$, $\beta = -.34$, $t(562) = -6.45$, $p < .01$). Based on these results, hypothesis 15 was supported.

Hypothesis 16 sought to examine the moderating effect of non-financial rewards on the relationship between performance prove orientation (PPO) and knowledge giving. Non-financial rewards, PPO, and the centered interaction term were added to the regression to test for moderation. See Table 17. The full model with the centered interaction term was significant, $R^2 = .05$, $F(6,562) = 4.52$, $p < .01$, but adding the interaction term did not result in improved prediction of knowledge giving, $\Delta R^2 = .00$, $p = .13$. Furthermore, the beta coefficient was not significant for the centered interaction term in predicting knowledge giving ($\beta = -.07$, $t(562) = -1.53$, $p = .13$). Therefore, the relationship between PPO and knowledge giving was not moderated by non-financial rewards, and hypothesis 16 was not supported. A summary of the results for hypotheses 1 – 16 is presented in Table 26.

Chapter 6: Discussion

Summary and implications

To contribute to extant knowledge sharing literature, the purpose of this work was two-fold. Firstly, to develop adequate scales for knowledge sharing behavior (KSB), rewards, and organizational learning culture (OLC). Secondly, to use these scales in testing relationships among the constructs as well as moderators to those relationships. To summarize, I hypothesized that KSB and rewards are multidimensional constructs, with each dimension of rewards exhibiting a relationship with each dimension of KSB. I also hypothesized that the relationships between rewards and KSB are moderated by individual career stage. Next, I proposed that the three dimensions of goal orientation (LGO, PPO, PAO) exhibit different relationships with KSB. Following person-situation interaction theory, I further proposed that goal orientation relationships are moderated by contextual factors, such as organizational learning culture and rewards. Study hypotheses are presented in Table 26 and Figure 2. What follows is a summary of the findings, a discussion of their implications, and suggestions for future research.

This study yielded support for KSB as a multidimensional construct with two factors reflecting knowledge giving behavior (KG) and knowledge asking behavior (KA). Acceptable fit indices and the interpretability of this 2-factor solution were demonstrated with EFA and cross-validated in a second sample using CFA. The 2-factor structure is consistent with the conceptual definition of KSB referenced across the literature as the process of both acquiring and providing knowledge. The high factor loadings in each subscale indicate that the items are inter-correlated

and strongly influenced by a common underlying factor. The moderate interfactor correlation between knowledge giving and knowledge asking indicates the multidimensionality of the knowledge sharing behavior scale. As expected, asking and giving are distinct yet correlated knowledge sharing behaviors and should be measured with separate subscales. An individual may rate highly on one behavior and lowly on the other behavior, or rate highly on both. In contrast, the sharing of tacit (e.g., advice, insight, understanding) and explicit (e.g., information, facts, procedures) forms of knowledge do not appear as separate dimensions of knowledge sharing behavior.

Altogether, the results demonstrate factor structure stability and provide preliminary validity evidence for the scale as an operationalization of knowledge sharing behavior. Future studies should follow up with a confirmatory factor analyses approach to multitrait-multimethod (MTMM) data in order to examine convergent and discriminant evidence in more depth (e.g., Widaman, 1985). Researchers have claimed the importance of informal learning and KSB in organizations. However, empirical research on the topic of knowledge sharing has lagged behind practice and is fractured with inconsistent operationalizations. The provision of a reliable and validated knowledge sharing behavior instrument can allow researchers to build empirical support for its impact in organizations and investigate ways to promote KSB among employees. For example, researchers may use this instrument to evaluate whether knowledge sharing (as a form of informal learning) increments over formal training in predicting employee learning and transfer.

Next, this study provides a measurement instrument with good psychometric properties for rewards. In past literature, rewards for knowledge sharing have commonly been categorized as intrinsic or extrinsic, without much empirical backing. Based on a literature review of the

types of rewards that have been studied, it was hypothesized that affective, social, and financial rewards would emerge as three distinct dimensions of expected rewards.

EFA results supported the multidimensional nature of the construct; however, instead of three factors, only two factors were found to fit the data, with one factor reflecting financial rewards and the other factor reflecting non-financial rewards. CFA with a second sample further showed the stability of this 2-factor structure. These results contribute several insights.

First, this study provides validity evidence for measuring expected rewards with two subscales. Factor analysis confirmed that a latent structure with two factors (financial and non-financial) fits the data well, based on goodness of fit standards, high factor loadings, and moderate interfactor correlations. This factor structure bears some resemblance to Herzberg's (1959) two-factor motivator-hygiene theory. According to this theory, one factor consists of "motivators" (e.g., achievement, recognition, personal growth) that promote higher job satisfaction and subsequent job performance, while a second factor consisting of "hygienes" (e.g., salary, benefits, job security) minimize or lead to lower job *dissatisfaction*. In this study, financial rewards (e.g., pay, promotion, perks) may be similar to "hygienes," and non-financial rewards (e.g., sense of achievement, fulfillment, reduce errors and confidence) may overlap with "motivators". However, the present study does not speak to the motivator-hygiene theory's tenets regarding job satisfaction and dissatisfaction as two separate constructs nor the notion that "hygienes" only affect dissatisfaction (without exerting any influence on satisfaction). Current conceptualizations of job satisfaction and dissatisfaction view them as opposite ends of a single continuum (Judge & Kammeyer-Muller, 2012). Furthermore, the results from this study do not show support for the intrinsic-extrinsic distinction of rewards that has been proposed in past knowledge sharing studies and some interpretations of Herzberg's (1959) theory. While the non-

financial rewards factor consisted of conceptually intrinsic indicators, such as satisfaction, fulfillment, and sense of achievement (i.e., the behavior itself provides rewarding feelings), it was also reflected by conceptually extrinsic items, such as friendship/alliances, reciprocal behavior from colleagues, and reducing errors at work (i.e., a rewarding outcome of the behavior apart from the behavior itself). Therefore, the nature of the latent construct driving correlations among these variables cannot be labeled as intrinsic or extrinsic. This has implications for how researchers should continue to examine rewards in the context of knowledge sharing. As demonstrated by this study, a financial versus non-financial distinction of rewards may be more appropriate.

The results from this study further inform our understanding of the rewards construct by showing that social rewards overlap with other dimensions of rewards. The majority of SMEs (71%) categorized items such as gaining respect, praise, and recognition from peers as social rewards. However, other SMEs felt the items shared overlap with affective rewards and financial rewards. EFA results mirrored this, where conceptually social rewards (popularity, cooperation, image, reputation) did not strongly load on a separate factor. Instead they exhibited cross-loadings on the factor with mostly affective items (e.g., sense of achievement, sense of fulfillment, sense of satisfaction) and the factor reflecting financial rewards (e.g., pay, promotion, prizes). These cross-loadings suggested the items were not pure indicators of a distinct dimension of rewards and therefore were not included in the final measurement instrument.

Overall, these findings contribute to our understanding of KSB as comprised of two distinct yet related behaviors, knowledge giving and knowledge asking. This study also contributes by uncovering two distinct dimensions of rewards for knowledge sharing, financial

and non-financial. Past studies have used inconsistent operationalizations for both knowledge sharing behavior and rewards. This study clarifies the number and nature of underlying constructs as well as provides new instruments to measure these constructs with evidence of reliability and validity. Researchers can continue to use these scales to move towards building a cohesive framework for KSB with consistent operationalizations. Future studies can use the KSB scale to further examine the construct's nomological network by testing theoretically related antecedents and outcomes of knowledge giving and knowledge asking behavior.

The next set of hypotheses focused on clarifying the nature of the reward-knowledge sharing relationship proposed in previous literature. Rewards warrant closer investigation because they are commonly used as incentives for increasing behavior, but empirical research has produced mixed findings regarding their motivating effects on knowledge sharing behavior. Mixed findings in the literature may be due to various reasons, such as inconsistent operationalizations of the predictor (rewards) and the criterion (KSB), methodological issues such as low statistical power in studies reporting no relationship, or effects of moderator variables. Competing theories have also been put forth, such as the undermining effect, where rewards are claimed to undermine motivation and lead to lower performance.

Several studies have reported a positive relationship between rewards and knowledge sharing behavior (e.g., Cabrera et al., 2006; Kankanhalli et al., 2005; Liu & Fang, 2010). However, these studies used problematic measures. For instance, Cabrera et al. (2006) and Liu & Fang (2010) analyzed knowledge asking and knowledge giving collectively as one dependent variable. Kankanhalli et al. (2005) assessed frequency of electronic knowledge repository usage as their dependent variable. Based on the methodology of these studies, it is impossible to

conclude whether the observed relationship from rewards was with knowledge asking or with knowledge giving.

The present study used subscales for each dimension of constructs and found that rewards do not predict both types of knowledge sharing behavior. More specifically, the results of this study supported the hypotheses that non-financial and financial rewards predict knowledge asking. However, no significant relationship from either type of reward was found with knowledge giving. This study's examination of knowledge sharing as two distinct behaviors indicates they may have different antecedents and might offer an explanation for the mixed findings that have been reported in previous literature regarding the relationship between rewards and KSB. At the least, this study shows that separately measuring components of knowledge sharing behavior can give us a clearer picture of the relationship. The interfactor correlation between KG and KA was moderate (.53), suggesting that they are distinct aspects of the same construct. The finding that they are not predicted by the same antecedents also lends support to the discriminant validity of the two dimensions. As demonstrated, the stronger the belief that asking for knowledge increases the likelihood of receiving a promotion, pay raise/bonus, improving their confidence and sense of accomplishment, the more likely individuals are to engage in that behavior (i.e., ask colleagues for their knowledge). Conversely, rewards might not be a predictor of knowledge giving behavior.

A possible explanation for the differential effect of rewards on KG and KA is that knowledge asking is motivated by personal gain, such as rewards to elevate one's position, whereas knowledge giving is more altruistic in nature and less motivated by personal gain. Asking for knowledge is more likely to be driven by self-interest. In contrast, giving knowledge to others is more driven by an unselfish desire to help others. Future studies should examine how

KSB fits into the broader organizational citizenship behavior (OCB) framework. If knowledge giving is part of OCB, then it should exhibit the same pattern of relationships that have been demonstrated in the OCB literature. For instance, it should correlate positively with job satisfaction and leadership behaviors, while it should correlate negatively with negative affectivity (Organ & Ryan, 1995). Factor analysis may also be used to examine the latent constructs underlying a set of OCB and KSB items.

Other notable differences between my study and previous studies' methodology may offer an explanation for the difference in results (i.e., previous studies reporting a relationship between rewards and KSB while my study did not find a relationship between rewards and knowledge giving). For instance, the sample demographics of studies reporting a significant relationship between rewards and KSB were substantially different from the sample characteristics of the present study. For instance, Cabrera et al. (2006) examined predominately (66%) male Spanish information technology workers, and Kankanhalli et al. (2005) used a sample of predominately (57%) male Singaporean knowledge management practitioners. In the present study, the sample consisted of workers in the United States, predominately female (76%), Caucasian (53%), and employed across a variety of occupations. There may be cultural differences (e.g., collectivistic versus individualistic cultures) in how strongly rewards are motivating for work behaviors (Witherspoon et al., 2013). Additional analyses with the present study's data suggested that gender may possibly be a moderator of the effect of financial rewards on knowledge giving behavior ($\Delta R^2 = .01$, $p < .05$, $\beta_{\text{interaction term}} = -.51$, $t(563) = -2.39$, $p < .05$), where a stronger relationship existed for males. These results underscore the importance of replicating these relationships across diverse samples and investigating the potential moderating roles of gender and culture in future studies.

Overall, this study helps to clarify our current understanding of rewards and knowledge sharing. Researchers stand divided on the motivational effect of rewards. They have been used in practice under the assumption that they are incentivizing, but some researchers have claimed that rewards can undermine motivation. A closer look provided by the present investigation reveals that rewards may only motivate the knowledge asking dimension of KSB. The existence of a relationship between rewards and KA has implications for practice. To foster informal learning, organizations can leverage performance management practices (e.g., promotions, salary, perks and prizes) to increase knowledge asking behavior in employees. They may also find ways to strengthen employees' belief that asking for knowledge will lead to a stronger sense of fulfillment, achievement, friendship, and reciprocity. In terms of promoting knowledge giving behavior, increasing rewards may not directly lead to an improvement. In order to draw more confident conclusions for theory and practice, future studies should give further attention to the null finding between rewards and knowledge giving behavior. More research is needed to examine whether this pattern of results replicates and if so, why this pattern exists. As more primary studies examine the relationships between dimensions of rewards and dimensions of KSB (perhaps using the scales developed from this study), a meta-analysis should be conducted.

Next, the present study demonstrated that the motivational value of non-financial rewards can depend on individual career stage. Career stage was found to moderate the relationship between non-financial rewards and knowledge giving behavior, but not in the hypothesized manner. It was hypothesized that individuals in the establishment career stage value non-financial rewards more than individuals in exploration and disengagement career stages. In theory, the motivational (VIE) value of rewards should be highest in the establishment stage. The data from this study, however, did not support this theoretical argument. The results revealed a

moderating effect of career stage; however, the relationship was positive and significant for the disengagement career stage while much weaker and non-significant in the exploration, establishment, and maintenance career stages.

It appears that individuals who are planning to reduce their involvement and leave their current field of work to pursue other interests (i.e., individuals in the disengagement stage) are more likely to give their knowledge to colleagues as non-financial rewards increase (e.g., sense of satisfaction, accomplishment, and fulfillment, building friendships and alliances, reducing errors at work). This finding implies that non-financial rewards are more salient to individuals in the disengagement stage. Drawing on the robust finding that job satisfaction is negatively associated with turnover (Tett & Meyer, 1993), it is plausible that individuals in the disengagement stage (i.e., those who are planning to turnover) feel low job satisfaction and as a result are particularly eager for non-financial rewards, such as a sense of achievement, satisfaction, and fulfillment from their work. When the workplace offers these rewards as a consequence for knowledge giving, these individuals are more motivated to perform. For individuals in the other career stages, this study does not show strong evidence for a relationship between rewards and knowledge giving behavior.

The observed moderating effect offers some evidence that career stage plays a role in the relationship between rewards and KSB and that it is a worthy variable for investigation. However, what has been theorized about the desires and career concerns of individuals in the disengagement stage may not hold true with regard to KSB. Despite planning to depart an organization, disengagement individuals may not be completely unconcerned with rewards. "Valence" of non-financial rewards may be high in the disengagement stage rather than low, counter to what was originally theorized.

Another possibility for this pattern of effects has to do with measurement. Compared to other career development theories, the advantage of Super's (1957) career stage theory is its applicability to modern workers who start second or third careers. However, this may have caused contamination issues with the measurement of disengagement stage. Individuals who are retiring from work and individuals who are leaving one job for another are both theoretically in the disengagement stage. However, it is possible for individuals who are retiring from work to exhibit a different response pattern compared to those who are leaving one organization to pursue a different job or career. While the former of the two may not place great value on organizational rewards as they exit the working world, the latter may still desire rewards, such as sense of fulfillment or building friendships and alliances, particularly if they are leaving one job for another due to low job satisfaction. The self-select and Likert measures of disengagement stage used in this study did not distinguish between retirement individuals and individuals pursuing a new career. Future studies might seek to tease apart the relationship for different types of disengagement stage individuals. More research on this topic can further test the applicability of career stage theory and expectancy (VIE) theory in explaining when rewards are motivating for KSB.

Next, the present study showed support for the relationship between LGO and knowledge sharing behavior, consistent with past literature. It further demonstrated the incremental validity over rewards and that LGO is predictive of both knowledge asking and knowledge giving, although the relationship between LGO and knowledge asking became non-significant with the inclusion of PAO as a predictor.

These results substantiate the claim that individuals who have a high focus on learning or mastery are more likely to give their knowledge to others and ask to learn knowledge from

others. Learning goal-oriented individuals value the process of learning itself and therefore are likely intrinsically motivated to share knowledge. The tendency for these types of individuals to strive and set standards for self-improvement may further explain the association with not just knowledge asking but also with knowledge giving behavior. Teaching or giving knowledge to a colleague can be a method to assess one's own level of development (i.e., it is a type of metacognition, which refers to the self-monitoring, planning, and revising of goal-oriented behavior in self-directed learning). Past research has suggested a link between LGO and meta-cognition (e.g., Delahaij & van Dam, 2015; Sujan, Weitz, & Kumar, 1994).

This study also sheds light on two other dimensions of goal orientation that have not been separately examined in relation to KSB before. The first of these dimensions is PPO, which did not demonstrate a relationship with knowledge giving nor with knowledge asking. Furthermore, there was no support for the hypothesis that non-financial rewards moderate the relationship between PPO and knowledge giving. It was theorized that PPO individuals are motivated by gaining favorable judgements from others and would use knowledge giving as a medium for displaying their competence, but the data from this study did not support this rationale. Perhaps PPO individuals do not use KSB as a way to show off their competence. Even in the presence of high non-financial rewards (e.g., improved confidence, sense of accomplishment, friendship/alliances, reciprocal behavior from colleagues), PPO individuals are not more likely to give knowledge. One possible reason for this null finding is methodological. Strong PPO individuals are in theory motivated by social recognition of their competence (e.g., praise), which was not captured by the non-financial rewards subscale in this study. Moreover, researchers have put forth that PPO individuals are motivated by social comparison and are inherently competitive against others (e.g., Dietz, van Kippenberg, Hirst, & Restubog, 2015).

While this can have a motivating influence on performance, it may not have the same effect on KSB. For instance, if knowledge giving behavior is conceptualized as an altruistic behavior, rather than as a way to show off competence, then a relationship would not be expected. Furthermore, withholding knowledge rather than sharing knowledge with others may be more compatible with the goals of a competitive person.

The present study did find a negative relationship between PAO and both knowledge giving and asking, where individuals more avoidant of performance situations were less likely to engage in knowledge sharing behavior. PAO also demonstrated incremental validity over rewards in predicting knowledge asking behavior. These results support the notion that PAO individuals abstain from performance situations they find threatening to the appearance of their competence. Both the act of asking and giving knowledge can reveal what they don't know and lead to unfavorable judgments about their competence. Past studies have shown a negative relationship between performance goal orientation and knowledge sharing. The present study suggests this relationship may be driven primarily by PAO rather than PPO.

In sum, this study shows LGO, PPO, and PAO exhibit differential relationships with KSB, providing support for the three factors of goal orientation proposed by Vandewalle (1997) and the interpretation of performance goal orientation as consisting of two separate dimensions: prove and avoid. Second, this study shows that KSB is goal-directed. The way in which individuals interpret and respond to achievement or performance situations guides the extent of their KSB. These results have implications for practice. Organizations that value employee informal learning can use selection procedures to capitalize on the influence of LGO on KSB. Candidates may be selected using a measure of LGO or using more conventional personality testing. Past research has demonstrated that most of the Big Five personality traits are positively

associated with LGO and negatively associated with PAO (Payne et al., 2007). Future research may investigate whether goal orientations add to the prediction of informal learning over and above personality.

Third, the results from this study contribute to a growing body of research on goal orientations. The pattern of relationships observed in this study between goal orientation dimensions and KSB is consistent with research on learning. Meta-analysis has shown that LGO is positively related to learning, PAO is negatively related to learning, and PPO is unrelated to learning (Payne et al., 2007). Future research should continue building the nomological network for goal orientations (LGO, PAO, and PPO) by examining differential relationships with outcome variables. In particular, limited studies have examined the relationship between PAO and job performance. An interesting research question is whether the same pattern of relationships observed in this study with KSB and past studies with learning will be observed with job performance.

Another direction for meaningfully extending this area of research is to examine the mediating mechanisms for these differential relationships. Models of goal orientation depict proximal outcomes of goal orientation that in turn lead to distal performance outcomes (e.g., Payne et al., 2007). Accordingly, mediating variables, such as state affect or emotions, should be tested to see how goal orientations affect KSB through emotions. For instance, LGO might be proximally related to enjoyment while PAO might be proximally related to anxiety which in turn predict KSB. This will provide an explanation for the relationships observed between goal orientations and KSB.

The final contribution of this study lies in demonstrating the moderating effect of organizational learning culture on the relationship between PAO and knowledge giving. As

hypothesized, PAO had a stronger influence on knowledge giving in a low organizational learning culture. In a high organizational learning culture, the relationship was still significant and negative, but the magnitude of the relationship was weaker. Strong situations can place pressure on individuals to behave in a certain way despite their personality characteristics. As shown in this study, PAO individuals were more inclined to engage in knowledge giving when there was a learning culture that was strong. This provides some support for the theory that a strong situation (e.g., high organizational learning culture) can constrain the expression of personality, while a weak situation can allow for more unconstrained expression of personality through behavior (Mischel, 1977). Although the direction of the relationship did not change in a high organizational learning culture, the strength of PAO's negative influence on knowledge giving was attenuated. This study answered the call of Cooper & Withey (2009) to empirically test the moderating strength of the situation and contribute evidence in support of the situational variability of organizational behavior. Furthermore, this result suggests that there are steps organizational leaders can take to implement and help promote informal learning. For instance, a value placed on employee learning that is evident in a company's policies and practices may help encourage PAO individuals to increase knowledge giving behavior. Lastly, the observed interaction effect indicates that the person-situation interaction framework may serve as an appropriate approach to organizing research on KSB antecedents. Future studies might continue this study's goal of examining not just the basic relationships between antecedents and KSB but also the complex interactive relationships that may exist in this domain.

Limitations

A number of limitations to this work should be acknowledged. First, observed relationships among constructs generally depend on the quality of measurement. Precautionary

steps were taken to develop measurement instruments with good psychometric properties in terms of reliability and evidence of validity based on item content and factor structure. For instance, a point was made to develop sufficient items to adequately cover the construct domain (e.g., both tacit and explicit forms of knowledge were written for knowledge sharing behavior items), and factor analysis was utilized to select items with clean and strong factor loadings. Although EFA results in Study 1 showed acceptable fit, the CFA results in Study 2 with a second sample demonstrated only marginal fit for the organizational learning culture instrument (90% CI for RMSEA was .071, .119) and marginal fit for the 2-factor knowledge sharing behavior instrument (90% CI for RMSEA was .081, .094). These results suggest that the models only marginally fit the data, rather than being a close fit to the data. The items used to represent OLC and KSB could be improved. In cases where existing scales were used, they were selected because previous studies reported high reliability and factor analytic support. For instance, Vandewalle's (1997) goal orientation measure is an established scale frequently used in organizational research. However, in this study, the measure of PPO did not show strong internal consistency reliability ($\alpha = .69$). Low reliability suggests that the instrument was not an adequate measure of the construct and prevents the ability to confidently draw conclusions from the results obtained with this measure.

Next, the use of a predominately student sample has limitations. The goal was to obtain a sample of participants representative of the general working population. Therefore, steps were taken to recruit participation from sources beyond university students, although they ultimately still made up the majority (85%) of the sample. Student samples have been criticized for being primarily Western, highly educated, industrialized, rich, and democratic ("WEIRD"). Additionally, the majority of both samples were female, limiting their generalizability to

populations outside of these demographics (Henrich et al., 2010; Landers & Behrend, 2015). Results from a predominately student sample may not generalize to the overall working population. Future studies may seek to replicate these findings with more diverse samples, particularly with regard to gender, nationality, level of education and tenure.

In the present study, self-identified career stage demonstrated variability in responses (exploration stage n = 225, establishment stage n = 86, maintenance stage n = 96, and disengagement stage n = 162), giving some indication of the representativeness of the sample. Although a predominately student sample was used, the generalizability of this study's results may be indicated in several ways. First, LGO was positively related to KSB, which is consistent with results found in non-student samples (e.g., the same result was reported in a sample of 418 hotel employees; Kim & Lee, 2013). Second, the factor structures derived in this study showed evidence of stability across samples. For instance, the expected cross-validation index (ECVI) of the final models in Study 1 suggest that they have a better likelihood of replication in other samples than alternative factor structures, and cross-validation of the final models using a second sample (Study 2) showed acceptable fit for knowledge giving rewards, knowledge asking rewards, knowledge sharing behavior, and at least marginal fit for the 1-factor model of organizational learning culture.

A third limitation is the use of a cross-sectional correlational design. Data on the measures were collected from individuals at the same point in time and no variables were experimentally manipulated. A cross-sectional study has advantages in the efficiency of data collection (e.g., less issue with attrition) and provides information on the relationships among variables and at the present point in time. The limitation of such a design is that it does not allow for claims of causality. This study has only shown an association between the variables of

interest. Although it is theoretically plausible for the person and contextual variables in this study to influence knowledge sharing behavior, an experimental research design with better control for threats to internal validity is necessary to infer that one is a consequence of another. The present study can be used as a springboard for future research, serving as a guide for experimental or longitudinal studies. Establishing temporal precedence and ruling out plausible alternatives through a controlled experiment can provide a stronger basis for inferring the direction of effects (Highhouse, 2009; Shadish, Cook, & Campbell, 2002).

A fourth limitation is with regard to the self-report measures used in this study. Self-report is appropriate for assessing people's attitudes and feelings, such as one's level of concern regarding career tasks and one's attitude toward performance situations. However, an inherent issue with self-reports is the possibility for respondents to be inaccurate in their reporting due to inaccuracies in memory, perceptions, or biases. This would manifest as a source of measurement error which could affect reliability and results. Therefore, self-report may not be the most effective measure of actual behavior.

Moreover, researchers often raise the concern of common method bias with single source (e.g., all self-report) measures. It is assumed that using the same method inflates correlations; however, this is not automatically the case. In situations where two self-report measures share a common source of bias, such as social desirability responding, then an inflated correlation may occur. Some self-report measures used in this study were subject to potential social desirability responding, which is the tendency for respondents to answer in a way that they feel will be perceived favorably by others. For instance, some respondents may have been reluctant to admit that they don't help colleagues when presented with the opportunity to do so, resulting in a score for KSB that is higher than their true score. Respondents may have also presented themselves

more positively on the goal orientation measures, depicting themselves as someone who strives to learn and doesn't mind failure. This may be particularly true for students because a desire to learn is expected in academia. Efforts were made in the design and execution of this study to reduce the incidence of social desirability responding, such as instructing participants to answer honestly, explaining their contribution to science, and assuring participants that survey responses will be used for research purposes only without affecting their job.

Using multi-source measures rather than single-source self-reports may better mitigate concerns of potential social desirability and inflated correlations. They may also serve as a more objective measure of KSB than self-report. Therefore, future studies can measure KSB with peer or supervisor ratings and examine any differences in results with the use of these sources. They may also measure social desirability to check the extent of its effect on participants' responses.

Lastly, organizational leaning culture was measured at the individual level, as an individual perception of how much one's organization values or promotes employee learning. Future studies may sample from multiple organizations and use an aggregated group-level measure of OLC coupled with multilevel modeling (HLM) to examine the cross-level moderating effect of "actual" culture (as opposed to individual perception of culture) on the relationship between goal orientation and KSB.

Conclusion

In summary, this work sought to refine the measurement of rewards and knowledge sharing behavior as well as clarify the relationship between the two constructs. New measurement instruments were developed for rewards, knowledge sharing behavior, and organizational learning culture. Evidence of validity for the instruments as operationalizations of these constructs was demonstrated through content validation and factor analytic procedures.

Stable factor solutions demonstrated the multidimensionality of rewards and knowledge sharing behavior, contributing to our understanding of these constructs and informing us of how we should approach their measurement in future investigations. A closer look provided by this study suggests that financial and non-financial types of rewards are incentivizing for knowledge asking behavior but perhaps not for knowledge giving behavior.

Secondly, this work sought to address a gap in the literature by examining the relationship between separate goal orientation dimensions and knowledge sharing behavior. Support for the distinctiveness of the three dimensions was found by showing that all three goal orientations exhibit differential relationships with knowledge sharing behavior. One unexpected finding was no significant relationship between performance prove orientation and knowledge sharing behavior. Subsequent studies should further investigate evidence for a relationship and integrate new findings with past research showing that PPO tends to have a positive influence on job performance, while no relationship has been observed with learning performance (Payne et al., 2007).

Drawing on a person-situation interaction approach, this work sought to extend the knowledge sharing literature by testing two new variables, career stage and organizational learning culture, as moderators to the relationship between rewards and knowledge sharing behavior. The results indicate that the motivational value of rewards can depend on individual career stage. It was found that individuals in the disengagement stage, who are either planning to retire or planning to leave their current career for another, tend to value non-financial rewards for knowledge giving the most. Additionally, organizational learning culture can moderate the relationship between PAO and knowledge giving, where a strong organizational learning culture can reduce the negative influence of PAO on knowledge giving behavior. These results support

the theory that person characteristics interact with contextual characteristics to influence organizational behavior. Moreover, a strong situation can constrain the expression of personality and place pressure on an individual to behave a certain way.

In sum, this work offers new measurement instruments and an appropriate organizing framework for guiding future research on knowledge sharing behavior. It also prompts interesting research questions and directions for future inquiry. With a better understanding of the dimensionality of constructs and their differential relationships, researchers may begin to build a comprehensive model of knowledge sharing behavior and antecedents. From tests of this model, we can move towards informing practitioners of how to promote knowledge sharing behavior among employees and contribute to informal learning in organizations.

References

Amabile, T. (1997). Motivating creativity in organizations. *California Management Review, 40*(1), 39-58.

American Psychological Association. (2010). Standards for educational and psychological testing. Washington, D.C.

Anderson, J. & Gerbing, D. (1991). Predicting the performance of measures in a confirmatory factor analysis with a pretest assessment of their substantive validities. *Journal of Applied Psychology, 76*(5), 732-740.

Babcock, P. (2004). Shedding light on knowledge management. *HR Magazine, 49*(5), 46−50.

Bandura, A. (1982). The psychology of chance encounters and life paths. *American Psychologist, 37,* 747-755.

Bartol, K., & Srivastava, A. (2002). Encouraging knowledge sharing: the role of organizational rewards systems. *Journal of Leadership and Organization Studies*, *9*(1), 64−76.

Bednall, T., Sanders, K., & Runhaar, P. (2014). Stimulating informal learning activities through perceptions of performance appraisal quality and human resource management system strength: a two-wave study. *Academy of Management Learning & Education*, *13*(1), 45-61.

Behnke, T. (2010). Knowledge sharing at work: an examination of organizational antecedents (doctoral dissertation). St. Ambrose University.

Bell, B. & Kozlowski, S. (2008). Active learning: effects of core training design elements on

self-regulatory processes, learning, and adaptability. *Journal of Applied Psychology, 93,* 296-316.

Bell, B. & Kozlowski, S. (2010). Toward a learner-centered training design: an integrative framework of active learning. *Learning, Training, and Development in Organizations.* New York, NY: Taylor & Francis Group.

Bock, G. & Kim, Y. (2002). Breaking the myths of rewards: an exploratory study of attitudes about knowledge sharing. *Information Resources Management Journal, 15*(2), 14-21.

Bock, G., Zmud, R., Lee, J., & Kim, Y. (2005). Behavioral intention formation in knowledge sharing: examining the roles of extrinsic motivators, social-psychological forces, and organizational climate. *Management Information Systems Quarterly, 29*(1), 87-111.

Brown, T. (2006). *Confirmatory factor analysis for applied research*. New York, NY: Guilford Press.

Cabrera, A., Collins, W., & Salgado, J. (2006). Determinants of individual engagement in knowledge sharing. *International Journal of Human Resource Management 17*(2), 1-20.

Cabrera-Nguyen, E. (2010). Author guidelines for reporting scale development and validation results in the Journal of the Society for Social Work and Research. *Journal of the Society for Social Work and Research, 1*(2), 99-103.

Cameron, J., Pierce, W., & So, S. (2004). Rewards, task difficulty, and intrinsic motivation: a test of learned industriousness theory. *Alberta Journal of Educational Research, 50*(3), 317-320.

Campbell, D. T., & Fisk, D. W. (1959). Convergent and discriminant validation by the multitrait–multimethod matrix. Psychological Bulletin, 56, 81–106.

Campbell, J. (1990). Modeling the performance prediction problem in industrial and organizational psychology. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of Industrial and Organizational Psychology*. Palo Alto, CA: Consulting Psychologists Press.

Campbell, J. P. & Kuncel, N. R. (2001). Individual and team training. *Handbook of Industrial Work and Organizational Psychology.* Thousand Oaks, CA: Sage.

Cascio, W. & Aguinis, H. (2011). *Applied Psychology in Human Resource Management.* Upper Saddle River, NJ: Pearson Prentice Hall.

Cattell, R. B. (1978). The scientific use of factor analysis in behavioral and life sciences. New York: Plenum.

Chang, C. & Lin, T. (2015). The role of organizational culture in the knowledge management process. *Journal of Knowledge Management, 19*(3), 433–455.

Chao, G. (1997). Unstructured training and development: the role of organizational socialization. *Improving training effectiveness in work organizations*. Mahwah, NJ: Lawrence Erlbaum Associates.

Chiu, C., Hsu, M., & Wang, E. (2006). Understanding knowledge sharing in virtual communities: an integration of social capital and social cognitive theories. *Decision Support Systems, 42*, 1872-1888.

Choi, S., Kang, Y., & Lee, H. (2008). The effects of socio-technical enablers on knowledge sharing: an exploratory examination. *Journal of Information Science, 34*(5), 742-754.

Chowdhury, S. (2005). The role of affect and cognition-based trust in complex knowledge sharing. *Journal of Managerial Issues, 17*(3), 310-326.

Cohen, A. (1991). Career stage as moderator of the relationships between organizational

commitment and its outcomes: a meta-analysis. *Journal of Occupational Psychology, 64*, 253-268.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* Hillsdale, NJ: Lawrence Earlbaum Associates.

Colquitt, J., LePine, J., & Noe, R. (2000). Toward an integrative theory of training motivation: A meta-analytic path analysis of 20 years of research. *Journal of Applied Psychology, 85*(5), 678-707.

Cook, T. D., & Campbell, D. T. (1979). Quasi-experimentation: Design and analysis for field settings. Chicago: Rand McNally.

Cooper, W. & Withey, M. (2009). The strong situation hypothesis. *Personality and Social Psychology Review, 13*(1), 62-72.

Coovert, M. D., & McNelis, K. (1988). The number of factors problem in factor analysis: A review and program. Educational and Psychological Measurement, 48, 687-692.

Cummings, J. (2004). Work groups, structural diversity, and knowledge sharing in a global organization. *Management Science 50*(3), 352-364.

Darcy, C., McCarthy, A., Hill, J., & Grady, G. (2012). Work-life balance: one size fits all? An exploratory analysis of the differential effects of career stage. *European Management Journal, 30*, 111-120.

Deci, E. (1976). *Intrinsic Motivation*. London: Plenum Press.

Delahaij, R. & van Dam, K. (2016). Coping style developments: the role of learning goal orientation and metacognitive awareness. *Personality and Individual Differences, 92*, 57-62.

De Winter, J., Dodou, D. & Wieringa, P. (2009). Exploratory factor analysis with small sample

sizes. *Multivariate Behavioral Research, 44(2),* 147-181.

Dietz, B. van Kippenberg, D., Hirst, G. & Restubog, S. (2015). Outperforming whom? A multilevel study of performance prove goal orientation, performance, and the moderating role of shared team identification. *Journal of Applied Psychology, 100*(6).

Duarte, M. (1995). Career concerns, values, and role salience in employed men. *Career Development Quarterly, 43*(4), 338-349.

Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. Journal of Applied Psychology, 71, 500-507.

Elliot, A. & Church, M. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72*(1), 218-232.

Elliot, A. & Harackiewicz, J. (1996). Approach and avoidance achievement goals and intrinsic motivation: a mediational analysis. *Journal of Personality and Social Psychology, 70*(3), 461-475.

Fabrigar, L. & Wegener, D. (2012). *Exploratory Factor Analysis.* New York: NY. Oxford University Press.

Ferraro, F., Pfeffer, J. & Sutton, R. (2005). Economics language and assumptions: how theories can become self-fulfilling. *Academy of Management Review, 30*(1), 8-24.

Flaherty, K. & Pappas, J. (2002). The influence of career stage on job attitudes: toward a contingency perspective. *Journal of Personal Selling & Sales Management, 22*(3), 135-143.

Frese, M. (1995). Error management in training: conceptual and empirical results. *Organizational learning and technological change*. New York: Springer-Verlag.

Frese, M., Albrecht, K., Altmann, A., Lang, J., Papstein P., Peyerl R. (1988). The effects of an

active development of the mental model in the training process: experimental results in a word processing system. *Behavior and Information Technology, 7,* 295-304.

Geijsel, F., Sleegers, P., Stoel, R., Kruger, M. (2009). The effect of teacher psychological and school organizational and leadership factors on teachers' professional learning in Dutch schools. *Elementary School Journal, 4,* 406-427.

Goldberg, L., Johnson, J., Eber, H., Hogan, R., Ashton, M., Cloninger, C., & Gough, H. (2006). The international personality item pool and the future of public domain personality measures. Journal of Research in Personality, *40*(1), 84–96

Halpin, G., Ralph, J., Halpin, G. (1990). The Adult Career Concerns Inventory: validity and reliability. *Measurement and Evaluation in Counseling and Development, 22*(4), 196-202.

Hara, N. (2009). *Communities of practice: Fostering peer-to-peer learning and informal knowledge sharing in the work place.* Owen, J. M. (Ed.) Springer Berlin Heidelberg.

Hashim, K. & Tan, F. (2015). The mediating role of trust and commitment on members' continuous knowledge sharing intention: a commitment-trust theory perspective. *International Journal of Information Management, 35*(2), 145-151.

Heimbeck, D., Frese, M., Sonnentag, S., & Keith, N. (2003). Integrating errors into the training process. The function of error management instructions and the role of goal orientation. *Personnel Psychology, 56,* 333-361.

Henrich, J., Heine, S., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33,* 61–83.

Hewett, R. & Conway, N. (2016). The undermining effects revisited: the salience of everyday

verbal rewards and self-determined motivation. *Journal of Organizational Behavior, 37*, 436-455.

Hinkin, T. (1995). A review of scale development practices in the study of organizations. *Journal of Management, 21(5)*, 967-988.

Holland, J. (1985) *Making vocational choices: a theory of vocational personalities and work environments.* Odessa, FL: Psychological Assessment Resources.

Holland, J. (1996). Exploring careers with a typology: what we have learned and some new directions. *American Psychologist, 51*(4), 397-406.

Howell, D. (2010). *Statistical methods for psychology*. Wadsworth, Cengage Learning.

Hu, L. & Bentler, P. (1999). Cuttoff criteria for fix indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55.

Hunt, S., Sparkman, R., & Wilcox, J. (1982). The pretest in survey research: issues and preliminary findings. *Journal of Marketing Research, 19*, 269–273.

Hwang, Y., & Kim, D. J. (2007). Understanding affective commitment, collectivist culture, and social influence in relation to knowledge sharing in technology mediated learning. *IEEE Transactions on Professional Communication, 50*(3), 232−248

Jacobs, E. & Roodt, G. (2007). The development of a knowledge sharing construct to predict turnover intentions. *Aslib Proceedings, 59*(3), 229-248.

Kanfer, R. & Ackerman, P. (1989). Motivation and cognitive abilities. An integrative/aptitude-treatment interaction approach to skill acquisition. *Journal of Applied Psychology, 74*, 171-192.

Kankanhalli, A., Tan, B., & Wei, K. (2005). Contributing knowledge to electronic knowledge

repositories: an empirical investigation. *Management Information Systems Quarterly, 29*(1), 113-143.

Keith, N. & Frese, M. (2005). Self-regulation in error management training: emotion control and metacognition as mediators of performance effects. *Journal of Applied Psychology, 90,* 677-691.

Kim, S., Kim, M., & Yun, S. (2015). Knowledge sharing, abusive supervision, and support: a social exchange perspective. *Group & Organization Management, 40*(5), 599-624.

Kim, T. & Lee, G. (2013). Hospitality employee knowledge sharing behaviors in the relationship between goal orientations and service innovative behavior. *International Journal of Hospitality Management, 34,* 324-337.

Kraiger, K. (2008). Third generation instructional models: more about guiding development and design than selecting training methods. *Industrial and Organizational Psychology, 1,* 501-507.

Kuo, F. & Young, M. (2008). A study of the intention-action gap in knowledge sharing practices. *Journal of the American Society for Information Science and Technology, 59*(8), 1224-1237.

Kwok, S. & Gao, S. (2005). Attitude toward knowledge sharing behavior. *Journal of Computer Information Systems, 46*(2), 45-51.

Lam, A. & Lambermont-Ford, J. (2010). Knowledge sharing in organizational contexts: A motivation-based perspective. *Journal of Knowledge Management, 14*(1), 51-66.

Lam, S., Ng, T., & Feldman, D. (2012). The relationship between external job mobility and salary attainment across career stages. *Journal of Vocational Behavior, 80*(1), 129-136.

Landers, R. & Behrend, T. (2015). An inconvenient truth: arbitrary distinctions between

organizational, Mechanical Turk, and other convenience samples. *Industrial and Organizational Psychology: Perspectives on Science and Practice, 8*(2), 142-164.

Lave, J. & Wenger, E. (1991). *Situated learning: legitimate peripheral participation.* New York, NY: Cambridge University Press.

Lee, J. (2001). The impact of knowledge sharing, organizational capability and partnership quality on IS outsourcing success. *Informational and Management, 38*(5), 323-335.

Lee, J., Kim, Y., Kim, M. (2006). Effects of managerial drivers and climate maturity on knowledge-management performance: empirical validation. *Information Resources Management Journal, 19*(3), 48-60.

Lee, S., Yoo, Y., & Yun, S. (2015). Sharing my knowledge? An interactional perspective. *Journal of Managerial Psychology, 30*(8), 986-1002.

Levinson, D. (1986). A conception of adult development. *American Psychologist, 41*, 3-13.

Li, L., Grimshaw, J., Nielson, C., Judd, M., Coyte, P., & Graham, I. (2009). Use of communities of practice in business and health care sectors: a systematic review. *Implementation Science, 4*.

Lin, C. (2007). To share or not to share: modeling tacit knowledge sharing, its mediators and antecedents. *Journal of Business Ethics, 70*, 411-428.

Liu, W. & Fang, C. (2010). The effect of different motivation factors on knowledge sharing willingness and behavior. *Social behavior and personality, 38*(6), 753-758.

Locke, E. (2000). Motivation, cognition, and action: An analysis of studies of task goals and knowledge. *Applied Psychology: An International Review, 49*, 408-429.

Lohman, M. (2005). A survey of factors influencing the engagement of two professional groups

in informal workplace learning activities. *Human Resource Development Quarterly, 4,* 501-527.

MacCallum, R., Browne, M., & Sugawara, H. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1,* 130-149.

MacCallum, R. Widaman, K., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods, 4,* 84-99.

Mahoney, D. (1987). An exploration of the construct validity of a measure of adult vocational maturity (doctoral dissertation). Teacher's College, Columbia University. *Dissertation Abstracts International, 47.*

Matzler, K. & Mueller, J. (2011). Antecedents of knowledge sharing – examining the influence of learning and performance orientation. *Journal of Economic Psychology, 32,* 317-329.

Matzler, K., Renzl, B., Muller, J., Herting, S., & Mooradian, T. (2008). Personality traits and knowledge sharing. *Journal of Economic Psychology, 29*(3), 301-313.

McKinney, A. (2003). Goal orientation: a test of competing models (doctoral dissertation). Virginia Polytechnic Institute and State University.

Mischel, W. (1977). The interaction of person and situation. *Personality at the crossroads: current issues in interactional psychology.* Hillsdale, NJ: Lawrence Erlbaum.

Mischel, W. & Shoda, Y. (1995). A cognitive-affective system theory of personality: reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review, 102,* 246-268.

Molloy, J. & Noe, R. (2010). Learning a living: continuous learning for survival in today's talent market. *Learning, Training, and Development in Organizations.* New York, NY: Taylor & Francis Group.

Mount, M. (1984). Managerial career stage and facets of job satisfaction. Journal of *Vocational Behavior, 24*(3), 340-354.

Murayama, K., Kitagami, S., Tanaka, A., & Raw, J. (2017). People's naiveté about how extrinsic rewards influence intrinsic motivation. *Motivation Science, 2*(3), 138-142.

Murayama, K., Matsumoto, M., Izuma, K., & Matsumoto, K. (2010). Neural basis of the undermining effect of monetary reward on intrinsic motivation. *Proceedings of the National Academy of Sciences, 107*(49), 20911-20916.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science, 5*, 14-37.

Nunnally, J. (1978). *Psychometric Theory*. New York: MacGraw-Hill.

Organ, D. & Ryan, K. (1995). A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior. *Personnel Psychology, 48*, 775-802.

Ornstein, S., Cron, W., & Slocum, J. (1989). Life stage versus career stage: a comparative test of the theories of Levinson and Super. *Journal of Organizational Behavior, 10*, 117-133.

Ostroff, C. & Kozlowski, S. (1992). Organizational socialization as a learning process: the role of information acquisition. *Personnel Psychology, 45*, 849-874.

Ozlati, S. (2015). The moderating effect of trust on the relationship between autonomy and knowledge sharing: a national multi-industry survey of knowledge workers. *Knowledge and Process Management, 22*(3), 191-205.

Payne, S., Youngcourt, S. & Beaubien, J. M. (2007). A meta-analytic examination of the goal orientation nomological net. *Journal of Applied Psychology, 92*(1), 128-150.

Perrone, K., Gordon, P., Fitch, J., & Civiletto, C. (2003). The Adult Career Concerns Inventory: development of a short form. *Journal of Employment Counseling, 40*, 172-180.

Prime, D. (2016). The strong situation hypothesis: an examination using interpersonal theory (doctoral dissertation). Arizona State University.

Pulakos, E. Dorsey, D. & Borman, W. (2003). Hiring for knowledge-based competition. *Managing knowledge for sustained competitive advantage: designing strategies for effective human resource management* (155-177). San Francisco, CA: Jossey-Bass.

Quigley, N., Tesluk, P., Locke, E., & Bartol, K. (2007). A multilevel investigation of the motivational mechanisms underlying knowledge sharing and performance. *Organization Science, 18*(1), 71-88.

Ravasi, D. & Schultz, M. (2006). Responding to organizational identity threats: exploring the role of organizational culture. *Academy of Management Journal, 49*(3), 433-458.

Sessa, V. & London, M. (2006). *Continuous learning in organizations: individual, group, and organizational perspectives.* Mahwah, NJ: Lawrence Erlbaum Associates.

Shadish, W., Cook, T., & Campbell, D. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Houghton Mifflin.

Shoda, Y., Mischel, W., & Wright, J. (1994). Intraindividual stability in the organization and patterning of behavior: incorporating psychological situations into the idiographic analysis of personality. *Journal of Personality and Social Psychology, 67*(4), 674-687.

Skinner, B. (1938). *The behavior of organisms: an experimental analysis.* New York: Appleton Century.

Slocum, J., Jr., & Cron W. (1985). Job attitudes and performance during three career stages. *Journal of Vocational Behavior, 26*(2), 126-145.

Smart, R. (1994). Super's stages and the four-factor structure of the Adult Career Concerns

Inventory in an Australian sample. *Measurement and Evaluation in Counseling & Development, 26*(4), 243-257.

Smith, A. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations*. Simon & Brown.

Smith, E. Ford, J. & Kozlowski, S. (1997). Building adaptive expertise: implications for training design strategies. *Training for a rapidly changing workplace: applications of psychological research.* Washington, DC: American Psychological Association.

Srivastava, A., Bartol, K., & Locke, E. (2006). Empowering leadership in management teams: effects of knowledge sharing, efficacy, and performance. *Academy of Management Journal, 49*(6), 1239-1251.

Stamps, D. (1998). Learning ecologies. *Training, 35*, 32-38.

Sujan, H., Weitz, B. A., & Kumar, N. (1994). Learning orientation, working smart, and effective selling. *Journal of Marketing, 58*, 39–52.

Super, D. (1957). *The psychology of careers.* New York: Harper & Row.

Super, D. (1980). A life-span, life-space approach to career development. *Journal of Vocational Behavior, 16*(3), 282-296.

Super, D., Thompson, A., Lindeman, R., Myers, R., & Jordaan, J. (1986). *Adult Career Concerns Inventory.* Palo Alto, CA: Consulting Psychologists Press.

Super, D., Thompson, A., Lindeman, R. (1988). Adult Career Concerns Inventory. *Mental Measurements Yearbook, 12.*

Tannenbaum, S. (1997). Enhancing continuous learning: diagnostic findings from multiple companies. *Human Resource Management, 36*, 437-452.

Tannenbaum, S., Beard, R., McNall, L. & Salas, E. (2010). Informal learning and development

in organizations. *Learning, Training, and Development in Organizations.* New York, NY: Taylor & Francis Group

Taylor, W. & Wright, G. (2004). Organizational readiness for successful knowledge sharing: challenges for public sector managers. *Information Resources Management Journal, 17*(2), 22-37.

Tett, R. & Meyer, J. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: path analyses based on meta-analytic findings. *Personnel Psychology, 46*(2), 259-293.

Tracey, J., Tannenbaum, S., & Kavanagh, M. (1995). Applying trained skills on the job: the importance of the work environment. *Journal of Applied Psychology, 80*(2), 239-252.

Usoro, A., Sharratt, M.W., Tsui, E., & Shekhar, S. (2007). Trust as an antecedent to knowledge sharing in virtual communities of practice. *Knowledge Management Research & Practice 5*(3), 199-212.

Van den Hooff, B., & De Ridder, J. (2004). Knowledge sharing in context: the influence of organizational commitment, communication climate and CMC use on knowledge sharing. *Journal of Knowledge Management, 8*(6), 117-130.

Van den Hooff, B. & Van Weenen, F. (2004). Committed to share: commitment and CMC use as antecedents of knowledge sharing. *Knowledge and Process Management, 11*(1), 13-24.

Vandewalle, D. (1997). Development and validation of a work domain goal orientation instrument. *Educational and Psychological Measurement, 57*(6), 995-1015.

Vandewalle, D. (2003). A goal orientation model of feedback-seeking behavior. *Human Resource Management Review, 13*, 581-604.

Vandewalle, D., Cron, W., & Slocum, J. Jr. (2001). The role of goal orientation following

performance feedback. *Journal of Applied Psychology, 86*(4), 629-640.

Vroom, V. (1964). *Work and motivation*. New York: Wiley.

Wah, C., Menkhoff, T., Loh, B., & Evers, H. (2007). Social capital and knowledge sharing in knowledge based organizations: an empirical study. *International Journal of Knowledge Management (3)*1, 29-48.

Wang, J. (2008). Knowledge seeking and provision in work teams across multiple knowledge areas: a test and extension of transactive memory theory in the network approach (doctoral dissertation). University of Illinois at Urbana-Champaign.

Wang, S. & Noe, R. (2010). Knowledge sharing: a review and directions for future research. *Human Resource Management Review, (20),* 115-131.

Wasko, M. & Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *Management Information Systems Quarterly, 29*(1), 35-57.

Watkins, K., & Marsick, V. (1993). *Sculpting the learning organization: lessons in the art and science of systemic change*. San Francisco, CA: Jossey-Bass.

Wenger, E., McDermott, R., & Snyder, W. (2002) *Cultivating Communities of Practice.* Boston, MA: Harvard Business School Press.

Widaman, K. (1985). Hierarchically nested covariance structure models for multitrait-multimethod data. *Applied Psychological Measurement, 9*(1), 1-26.

Witherspoon, C., Bergner, J., Cockrell, C., & Stone, D. (2013). Antecedents of organizational knowledge sharing: a meta-analysis and critique. *Journal of Knowledge Management, 17*(2), 250-277.

Wolfe, C. & Loraas, T. (2008). Knowledge sharing: the effects of incentives, environment, and

person. *Journal of Information Systems, 22*(2), 53-76.

Worthington, R., & Whittaker, T. (2006). Scale development research: A content analysis and recommendations for best practices. *Counseling Psychologist*, *34*, 806-838.

Yi, J. (2009). A measure of knowledge sharing behavior: scale development and validation. *Knowledge Management Research & Practice*, 7, 65–81.

Tables

Table 1. Previous studies investigating rewards and knowledge sharing

Authors	Variables and Operationalizations	Findings
Knowledge Sharing Orientation		
Wah et al. (2007)	Reward incentives (extent to which KS is recognized through rewards and incentives)	Positive relationship $r = .69$, $p < .01$
Knowledge Sharing Attitude		
Behnke (2010)**	Extrinsic organizational rewards (promotion, better work assignment, financial incentives)	No relationship $\beta = -.02$ *ns*
Behnke (2010)**	Intrinsic organizational rewards (praise and recognition)	Positive relationship $\beta = .13$, $p < .05$
Bock & Kim (2002)	Expected extrinsic rewards	Negative relationship $\beta = -.124$, $p < .01$
Kwok & Gao (2005)	Extrinsic motivation (willingness to share if receive monetary rewards, avoid punishment, or build reputation)	No relationship $\beta = -.117$ *ns*
Knowledge Sharing Intention		
Behnke (2010)**	Extrinsic organizational rewards (promotion, better work assignment, financial incentives)	No relationship $\beta = .07$ *ns*
Behnke (2010)**	Intrinsic organizational rewards (praise and recognition)	No relationship $\beta = .03$ *ns*
Choi et al. (2008)	Extrinsic rewards (monetary incentives, bonuses, promotion)	Positive relationship $\beta = .16$, $p < .05$
Choi et al. (2008)	Intrinsic rewards (praise, public recognition, seen as an expert)	Positive relationship $\beta = .32$, $p < .01$
Witherspoon et al. (2013)*	Rewards: pay/promotion	Positive relationship $r = .11$, $p < .01$
	Rewards: reciprocity	Positive relationship $r = .36$, $p < .01$
Witherspoon et al. (2013)*	Intrinsic motivation (enjoy helping others through KS)	Positive relationship $r = .39$, $p < .01$
Wolfe & Loraas (2008)	Monetary and nonmonetary incentives perceived as sufficient (cash raises/bonuses and formal recognition from organization and peers)	Positive relationship $\beta = .285$, $p < .05$
Knowledge Sharing Willingness		
Liu & Fang (2010)	External motivation (hygiene factors, reputation, and mutual benefits)	No relationship $\beta = -.065$ *ns*
Liu & Fang (2010)	Internal motivation (altruistic dimension of OCB scale)	Positive relationship $\beta = .497$, $p < .01$
Knowledge Sharing Behavior		
Behnke (2010)**	Intrinsic organizational rewards (praise and recognition)	No relationship $\beta = .09$ *ns*
Cabrera et al. (2006)	Extrinsic rewards (promotion, gaining visibility, getting assigned interesting tasks)	Positive relationship $r = .17$, $p < .01$

Table 1 (continued). Previous studies investigating rewards and knowledge sharing

Cabrera et al. (2006)	Intrinsic rewards (reaching full potential or finding it rewarding when others use their ideas)	Positive relationship $r = .18$, $p < .01$
Chiu, Hsu & Wang (2006)	Personal outcome expectations (making friends, building reputation, feeling happy or sense of accomplishment, gaining cooperation)	No relationship KS quantity $\beta = -.10$ *ns* No relationship KS quality $\beta = .04$ *ns*
Kankanhalli, et al., (2005)	Extrinsic benefits (rewards): better work assignment, promotion, higher salary, bonus, job security Extrinsic benefits (image): praise, prestige, recognition, respect Extrinsic benefits (reciprocity)	Positive relationship $\beta = .22$, $p < .01$ No relationship $\beta = -.05$ *ns* No relationship $\beta = .11$ *ns*
Kankanhalli et al. (2005)	Intrinsic benefits (pleasure obtained from helping others through KS)	Positive relationship $\beta = .43$, $p < .001$
Liu & Fang (2010)	External motivation (hygiene factors, reputation, and mutual benefits)	No relationship $\beta = .039$ *ns*
Liu & Fang (2010)	Internal motivation (altruistic dimension of OCB scale)	Positive relationship $\beta = .391$, $p < .01$
Ozlati (2015)	Extrinsic motivations (reasons why they share knowledge, e.g., it's the rule)	No relationship $r = -.004$ *ns*
Ozlati (2015)	Intrinsic motivations (reasons why they share knowledge, e.g., because it is fun)	Positive relationship $r = .63$, $p < .001$
Wasko & Faraj (2005)	Reputation Like helping others Reciprocity	Positive relationship $\beta = .15$, $p < .05$ No relationship $\beta = .06$ *ns* Negative relationship $\beta = -.24$, $p < .05$
Witherspoon et al. (2013)*	Rewards: pay/promotion Rewards: reciprocity Rewards: reputation	Positive relationship $r = .27$, $p < .01$ No relationship $r = .05$ *ns* Positive relationship $r = .39$, $p < .01$
Witherspoon et al. (2013)*	Intrinsic motivation (like helping others through KS)	Positive relationship $r = .30$, $p < .01$

Notes. KS refers to knowledge sharing. * Meta-analysis. ** Dissertation.

Table 2. Study hypotheses

Purpose 1: Clarify the factor structure of knowledge sharing behavior
H1: Knowledge sharing behavior is a multidimensional construct.
Purpose 2: Clarify the factor structure of rewards for knowledge sharing
H2: Rewards for knowledge sharing is a multidimensional construct.
Purpose 3: Clarify the relationships between rewards and knowledge sharing behavior
H3: Non-financial rewards (e.g., getting a sense of satisfaction or rewarding feeling) exhibit a positive relationship with knowledge **giving**.
H4: Non-financial rewards (e.g., getting a sense of satisfaction or rewarding feeling) exhibit a positive relationship with knowledge **asking**.
H5: Financial rewards (e.g., pay or promotion) exhibit a positive relationship with knowledge **giving**.
H6: Financial rewards (e.g., pay or promotion) exhibit a positive relationship with knowledge **asking**.
H7: Career stage moderates the relationship between financial rewards and knowledge giving.
H8: Career stage moderates the relationship between financial rewards and knowledge asking.
H9: Career stage moderates the relationship between non-financial rewards and knowledge giving.
H10: Career stage moderates the relationship between non-financial rewards and knowledge asking.
Purpose 4: Clarify the relationships between goal orientations and knowledge sharing behavior
H11: Learning goal orientation exhibits a positive relationship with knowledge **giving**.
H12: Learning goal orientation exhibits a positive relationship with knowledge **asking**.
H13: Performance **prove** goal orientation exhibits a positive relationship with knowledge giving.
H14: Performance **avoid** goal orientation exhibits a negative relationship with knowledge giving.
H15: Organizational learning culture moderates the relationship between **performance avoid** goal orientation and knowledge **giving**, such that the relationship is weaker in a strong culture.
H16: Non-financial rewards moderate the relationship between **performance prove** goal orientation and knowledge **giving**, such that the relationship is stronger with more rewards.

Table 3. SME item sort task results

Items	P_{sa}	C_{sv}
Knowledge sharing behavior - giving		
1. I teach colleagues strategies that I know*	1.00	1.00
2. I impart insights that I have gained to colleagues*	1.00	1.00
3. I explain procedures that I know to others at work*	1.00	1.00
4. I impart lessons that I have learned to colleagues*	1.00	1.00
5. I give my ideas at work (not retained)	0.93	0.86
6. I explain my understanding of information to colleagues*	1.00	1.00
7. I inform colleagues of what I know*	1.00	1.00
8. I point out information that may be useful to colleagues*	1.00	1.00
9. I demonstrate techniques that I know to colleagues*	1.00	1.00
10. I give work related advice to colleagues*	0.93	0.86
11. I explain my know-how to colleagues*	1.00	1.00
12. I inform colleagues based on my experience on the job*	1.00	1.00
13. I remind my colleagues of information (not retained)	0.86	0.76
14. I communicate new facts I learn to colleagues*	1.00	1.00
15. I advise colleagues based on what I know*	1.00	1.00
16. I provide my expertise to others at work*	1.00	1.00
17. I contribute task information to colleagues*	1.00	1.00
18. I explain how to perform tasks to colleagues*	1.00	1.00
Knowledge sharing behavior – asking		
1. I ask colleagues for their expertise*	1.00	1.00
2. I ask colleagues to inform me of what they know*	1.00	1.00
3. I ask colleagues to remind me of information (not retained)	1.00	1.00
4. I ask colleagues to explain their know-how*	1.00	1.00
5. I ask colleagues to teach me techniques they know*	1.00	1.00
6. I ask colleagues to impart lessons they have learned on the job*	1.00	1.00
7. I ask colleagues to explain their understanding of information to me*	1.00	1.00
8. I request task information from colleagues*	1.00	1.00
9. I ask colleagues to explain strategies they use*	1.00	1.00
10. I ask colleagues to teach me their expertise*	1.00	1.00
11. I request work related information from colleagues*	1.00	1.00
12. I ask colleagues to communicate what they know from experience*	1.00	1.00
13. I ask for the insight of my colleagues*	1.00	1.00
14. I ask colleagues to explain the way to perform tasks*	1.00	1.00
15. I ask colleagues for work related information*	1.00	1.00
16. I ask colleagues to explain procedures they know*	1.00	1.00
17. I request advice from my colleagues based on what they know*	1.00	1.00
18. I ask colleagues to give their ideas (not retained)	0.93	0.86
Organizational learning culture		
1. In my organization, we are given resources to support our learning*	0.93	0.86
2. My organization offers a supportive learning environment*	1.00	1.00
3. In my organization, my supervisor gives me constructive feedback about my development*	0.93	0.86
4. In my organization, I am expected to engage in behaviors that promote learning*	1.00	1.00
5. My organization has a focus on continuous learning*	0.86	0.78
6. In my organization, employees value growing their expertise*	1.00	1.00
7. In my organization, employees are encouraged to learn from each other (not retained)	0.86	0.71
8. In my organization, I feel that my learning is important*	1.00	1.00
9. In my organization, my supervisor expects me to grow my skillset*	0.93	0.86
10. In my organization, I am given opportunities to put into practice what I learn (not retained)	0.78	0.57
11. In my organization, there are rules that we should attend educational events or trainings*	0.93	0.86

Table 3 (continued). SME item sort task results

12. In my organization, employees who engage in behaviors that promote learning are accepted by peers (not retained)	0.79	0.64
13. The norm at my organization is to engage in continuous learning*	1.00	1.00
14. In my organization, participating in learning activities is important for my performance evaluation*	1.00	1.00
15. In my organization, employees are expected to care about their professional development (not retained)	0.86	0.71
Expected rewards		
1. Employees who exchange (give/ask for) knowledge will receive more cooperation from colleagues*	0.93	0.86
2. Exchanging knowledge with colleagues will produce a sense of satisfaction with work*	1.00	1.00
3. Exchanging knowledge with colleagues will produce a sense of fulfillment with work*	1.00	1.00
4. Employees who exchange knowledge with colleagues will improve their popularity*	1.00	1.00
5. Exchanging knowledge with colleagues will help build friendships and alliances*	0.93	0.86
6. Employees will gain respect at work by exchanging knowledge with colleagues (not retained)	0.86	0.71
7. Employees will achieve a higher work or productivity rate by exchanging knowledge with colleagues*	0.86	0.79
8. Employees will improve their chance for higher pay or a bonus if they exchange knowledge with colleagues*	1.00	1.00
9. Employees will feel a sense of accomplishment in their job by exchanging knowledge with colleagues*	1.00	1.00
10. Enjoyment or fun on the job can be obtained from exchanging knowledge with colleagues*	0.93	0.86
11. Employees who exchange knowledge with colleagues will improve their image within the organization*	1.00	1.00
12. Exchanging knowledge with colleagues can lead to a better work assignment*	1.00	1.00
13. Employees will earn the praise of others at work if they exchange knowledge with colleagues (not retained)	0.86	0.71
14. Exchanging knowledge with colleagues can lead to getting more employee perks or prizes*	1.00	1.00
15. Exchanging knowledge with colleagues will help reduce costly errors at work*	0.93	0.86
16. Employees will improve their chance of promotion by exchanging knowledge with colleagues*	1.00	1.00
17. Employees will feel a sense of improved confidence from exchanging knowledge with colleagues*	1.00	1.00
18. Employees will improve their reputation by exchanging knowledge with colleagues*	1.00	1.00
19. Exchanging knowledge with colleagues will provide a feeling of job security (not retained)	0.79	0.64
20. A sense of achievement will be felt from exchanging knowledge with colleagues*	1.00	1.00
21. Exchanging knowledge with colleagues will lead to similar or reciprocal behavior from colleagues*	0.86	0.79
22. Employees who exchange knowledge with colleagues will receive due recognition from peers or supervisors (not retained)	0.71	0.43

Notes. $P_{sa} = n_c/N$, where N = 14 and n_c is the number of subject matter experts who assigned the item to its intended construct. $C_{sv} = (n_c - n_o)/N$ where n_o is the highest number of times the item was assigned to a construct other than the intended construct. *Retained items.

Table 4. Model fit indices for knowledge sharing behavior scale

Model	χ^2	df	p-value	RMSEA	90% CI	CFI	TLI	SRMR
32-item	1387.489	433	0.000	.098	.090, .100	.895	.880	.029
18-item	222.271	118	0.000	.062	.049, .074	.976	.969	.018

Note. N = 230.

Table 5. Geomin-rotated factor loadings for final knowledge sharing behavior scale

Items *(1 never – 6 always)*	Factors	
	Knowledge giving (9 items)	Knowledge asking (9 items)
1. I teach colleagues strategies that I know	**.830**	-.006
2. I explain my understanding of information to colleagues	**.806**	.100
3. I point out information that may be useful to colleagues	**.795**	.029
4. I demonstrate techniques that I know to colleagues	**.826**	.033
5. I inform colleagues based on my experience on the job	**.849**	-.029
6. I communicate new facts I learn to colleagues	**.789**	.092
7. I advise colleagues based on what I know	**.885**	-.003
8. I contribute task information to colleagues	**.905**	-.004
9. I explain how to perform tasks to colleagues	**.904**	-.016
10. I ask colleagues to explain their know-how	-.003	**.840**
11. I ask colleagues to impart lessons they have learned on the job	-.053	**.910**
12. I ask colleagues to explain strategies they use	.063	**.826**
13. I ask colleagues to teach me their expertise	-.003	**.899**
14. I request work related information from colleagues	.058	**.828**
15. I ask colleagues to communicate what they know from experience	.064	**.882**
16. I ask for the insight of my colleagues	-.018	**.916**
17. I ask my colleagues to explain the way to perform tasks	.050	**.836**
18. I request advice from my colleagues based on what they know	-.011	**.883**

Notes. N = 230. Factor loadings >.50 are in bold. Inter-factor correlation = .443*

Table 6. Model fit indices for organizational learning culture scale

Model	χ^2	df	p-value	RMSEA	90% CI	CFI	TLI	SRMR
11-item	324.992	44	0.000	.167	.150, .184	.857	.821	.062
6-item	16.649	9	0.055	.061	.000, .106	.990	.983	.027

Note. N = 230

Table 7. Geomin-rotated factor loadings for final organizational learning culture scale

Items *(1 strongly disagree – 6 strongly agree)*	Factor Organizational learning culture
1. In my organization, we are given resources to support our learning	**.705**
2. In my organization, my supervisor gives me constructive feedback about my development	**.770**
3. In my organization, I am expected to engage in behaviors that promote learning	**.861**
4. My organization has a focus on continuous learning	**.896**
5. In my organization, my supervisor expects me to grow my skillset	**.767**
6. There are rules that we should attend educational events or trainings at my organization	**.559**

Notes. N = 230. Factor loadings >.50 are in bold

Table 8. Model fit indices for rewards for knowledge giving scale

Model	χ^2	df	p-value	RMSEA	90% CI	CFI	TLI	SRMR
18-item	303.467	118	0.000	.083	.071, .094	.925	.903	.038
11-item	54.553	34	0.014	.051	.023, .076	.985	.977	.022

Note. N = 230

Table 9. Geomin-rotated factor loadings for final rewards for knowledge giving scale

Items *(1 strongly disagree – 6 strongly agree)*	Factors	
	Non-financial rewards for giving (8 items)	Financial rewards for giving (3 items)
1. Giving knowledge to colleagues will produce a sense of satisfaction with work	**.690**	-.038
2. Giving knowledge to colleagues will help build friendships and alliances	**.659**	-.007
3. Employees will improve their chance for higher pay or a bonus if they give knowledge to colleagues	.013	**.716**
4. Employees will feel a sense of accomplishment in their job by giving knowledge to colleagues	**.831**	-.003
5. Giving knowledge to colleagues can lead to getting more employee perks or prizes	.008	**.769**
6. Giving knowledge to colleagues will help reduce costly errors at work	**.561**	.087
7. Employees will improve their chance of promotion by giving knowledge to colleagues	-.013	**.901**
8. Employees will feel a sense of improved confidence from giving knowledge to colleagues	**.825**	.031
9. A sense of achievement will be felt from giving knowledge to colleagues	**.894**	-.069
10. Giving knowledge to colleagues will lead to similar or reciprocal behavior from colleagues	**.665**	.005
11. Giving knowledge to colleagues will produce a sense of fulfillment with work	**.808**	.100

Notes. N = 230. Factor loadings >.50 are in bold. Inter-factor correlation = .520*

Table 10. Model fit indices for rewards for knowledge asking scale

Model	χ^2	df	p-value	RMSEA	90% CI	CFI	TLI	SRMR
18-item	426.924	118	0.000	.107	.096, .118	.895	.864	.045
9-item	33.371	19	0.022	.057	.022, .089	.989	.979	.020

Note. N = 230

Table 11. Geomin-rotated factor loadings for final rewards for knowledge asking scale

Items *(1 strongly disagree – 6 strongly agree)*	Factors	
	Non-financial rewards for asking (6 items)	Financial rewards for asking (3 items)
1. Acquiring knowledge from colleagues will produce a sense of satisfaction with work	**.751**	.092
2. Asking colleagues for their knowledge will help build friendships and alliances	**.729**	-.031
3. Employees will improve their chance for higher pay or a bonus if they acquire knowledge from colleagues	.083	**.702**
4. Learning knowledge from colleagues can lead to getting more employee perks or prizes	-.079	**.886**
5. Employees will improve their chance of promotion by acquiring knowledge from colleagues	.010	**.800**
6. Employees will feel a sense of improved confidence from acquiring knowledge from colleagues	**.730**	.142
7. Acquiring knowledge from colleagues will produce a sense of achievement	**.861**	.035
8. Learning knowledge from colleagues will lead to similar or reciprocal behavior from colleagues	**.758**	-.044
9. Acquiring knowledge from colleagues will produce a sense of fulfillment with work	**.920**	-.008

Notes. N = 230. Factor loadings >.50 are in bold. Inter-factor correlation = .492*

Table 12. Descriptive statistics

Scale	N	M	SD	Skewness	Kurtosis
1. Knowledge giving	569	38.73	11.86	-.44	-.78
2. Knowledge asking	569	35.78	12.34	-.18	-.96
3. Financial rewards for knowledge giving	569	11.44	4.31	-.43	-.78
4. Financial rewards for knowledge asking	569	11.73	4.46	-.49	-.80
5. Non-financial rewards for knowledge giving	569	38.33	6.53	-1.48	3.77
6. Non-financial rewards for knowledge asking	569	28.66	5.49	-1.36	2.61
7. Learning goal orientation	569	23.08	4.82	-1.01	1.70
8. Performance avoid orientation	569	13.07	5.62	-.10	-1.12
9. Performance prove orientation	569	16.49	4.31	-.58	-.13
10. Organizational learning culture	569	25.71	5.90	-.79	.76
11. Career stage (self-select)	569	2.34	1.26	.19	-1.63
12. Exploration stage (ACCI)	453 (164)	11.49	3.88	-1.03	-.05
13. Establishment stage (ACCI)	453 (218)	12.68	4.05	.04	-.77
14. Maintenance stage (ACCI)	453 (30)	10.72	2.72	-.25	-.56
15. Disengagement stage (ACCI)	453 (41)	8.56	3.68	-.04	-1.14

Notes. N=569 for all variables except ACCI where N=453. The number of participants with that career stage as their highest score is reported in parentheses.

Table 13. Correlations and scale reliabilities

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Age	-																	
2. Org tenure	.65**	-																
3. Career tenure	.83**	.64**	-															
4. Knowledge giving (KG)	.17**	.15**	.19**	(.97)														
5. Knowledge asking (KA)	.06	.02	.04	.51**	(.97)													
6. Financial rewards for KG	-.10*	-.07	-.09*	.02	.17**	(.83)												
7. Financial rewards for KA	-.12**	-.08	-.12**	.06	.18**	.77**	(.87)											
8. Non-financial rewards for KG	-.02	-.00	-.01	.06	.14**	.39**	.35**	(.86)										
9. Non-financial rewards for KA	-.00	.03	.01	.08*	.21**	.34**	.41**	.72**	(.86)									
10. Learning goal orientation	.01	.04	.03	.16**	.18**	.21**	.22**	.37**	.33**	(.85)								
11. Performance avoid orientation	-.13**	-.15**	-.10*	-.26**	-.17**	.07	.08	.12**	.12**	-.11*	(.87)							
12. Performance prove orientation	-.15**	-.12**	-.14**	-.03	.05	.27**	.25**	.24**	.20**	.30**	.28**	(.69)						
13. Organizational learning culture	-.08	-.03	-.04	.01	.13**	.28**	.28**	.38**	.31**	.35**	.04	.20**	(.77)					
14. ^Career stage (self-select)	.11**	.11*	.11**	.01	-.07	-.15**	-.17**	-.11**	-.14**	-.08	-.02	-.09*	-.17**	-				
15. Exploration stage (ACCI)	-.49**	-.34**	-.45**	.07	.03	.03	.04	.04	.05	.11*	.03	.09	.07	-.18**	(.98)			
16. Establishment stage (ACCI)	.00	-.10*	-.07	.22**	.33**	.28**	.27**	.10*	.09	.16**	-.09	.18**	.28**	-.24**	.07	(.85)		
17. Maintenance stage (ACCI)	.22**	.14**	.17**	.36**	.37**	.22**	.17**	.14**	.11*	.21**	-.13**	.08	.26**	-.06	.01	.68**	(.70)	
18. Disengagement stage (ACCI)	-.35**	-.16**	-.27**	-.08	-.16**	-.06	-.02	-.04	-.05	-.05	.09	.03	-.15**	.22**	.41**	-.36**	-.33**	(.90)

Notes. N=569 for all variables except ACCI where N=453. ^Career stage (self-select) was categorical where 1=exploration, 2=establishment, 3=maintenance, 4=disengagement. *p<.05 **p<.01.

Table 14. Multiple regression (hypotheses 3, 5, 11, 13 – 14)

DV: Knowledge giving	Step 1	Step 2	Step 3	Step 4	Step 5
1. Age	.04	.04	.04	.04	.02
2. Org tenure	.04	.04	.03	.03	.01
3. Career tenure	.13	.13	.13	.13	.15*
4. Financial rewards for knowledge giving		.02	.01	.02	.01
5. Non-financial rewards for knowledge giving		.06	.01	.01	.05
6. LGO			.15**	.17**	.11*
7. PPO				-.05	.02
8. PAO					-.25**
R^2	.038**	.042**	.062**	.065**	.116**
ΔR^2	.038**	.004	.020**	.002	.052**

Notes. N=569. *p<.05 **p<.01. Standardized regression coefficients are shown.

Table 15. Multiple regression (hypotheses 4, 6, 12)

DV: Knowledge asking	Step 1	Step 2	Step 3	Step 4	Step 5
1. Age	.10	.12	.12	.12	.10
2. Org tenure	-.03	-.04	-.05	-.05	-.07
3. Career tenure	-.02	-.02	-.02	-.02	-.01
4. Financial rewards for knowledge asking		.12**	.11*	.11*	.11*
5. Non-financial rewards for knowledge asking		.16**	.13**	.13**	.16**
6. LGO			.12**	.13**	.08
7. PPO				-.03	.03
8. PAO					-.20**
R^2	.005	.059**	.071**	.072**	.105**
ΔR^2	.005	.055**	.012**	.001	.033**

Notes. N=569. *p<.05 **p<.01. Standardized regression coefficients are shown.

Table 16. Hypothesis 15: organizational learning culture moderator

DV: Knowledge giving	Step 1	Step 2	Step 3
1. Age	.04	.01	.02
2. Org tenure	.04	.01	.02
3. Career tenure	.13	.15*	.14*
4. PAO		-.25**	-.24**
5. Org learning culture		.03	.03
6. centered Culture X PAO			.11**
R^2	.038**	.097**	.109**
ΔR^2	.038**	.059**	.012**

Notes. N=569. *p<.05 **p<.01. Standardized regression coefficients are shown.

Table 17. Hypothesis 16: non-financial rewards moderator

DV: Knowledge giving	Step 1	Step 2	Step 3
1. Age	.04	.04	.04
2. Org tenure	.04	.04	.04
3. Career tenure	.13	.13	.13
4. Non-financial rewards for knowledge giving		.07	.05
5. PPO		-.01	-.02
6. centered Non-financial rewards X PPO			-.07
R^2	.038**	.042**	.046**
ΔR^2	.038**	.004	.004

Notes. N=569. *p<.05 **p<.01. Standardized regression coefficients are shown.

Table 18. Multiple regression (hypothesis 7: career stage moderator – self-select)

DV: Knowledge giving	Reference group: exploration			Reference group: establishment			Reference group: maintenance			Reference group: disengagement		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
1. Age	.05	.03	.01	.05	.03	.01	.05	.03	.01	.05	.03	.01
2. Org tenure	.12	.12	.12	.12	.12	.12	.12	.12	.12	.12	.12	.12
3. Career tenure	.27	.29	.31*	.27	.29	.31*	.27	.29	.31*	.27	.29	.31*
4. Financial rewards for knowledge giving		.10	-.00 (-.00)		.10	-.35 (-.13)		.10	.02 (.01)		.10	.38 (.14)
5. Career stage (Dummy1)		1.37	5.89		-1.37	-5.89		-.00	.19		.03	4.17
6. Career stage (Dummy2)		.00	-.19		-1.37	-6.07		1.37	6.07		1.41	10.06*
7. Career stage (Dummy3)		-.03	-4.17		-1.41	-10.06*		-.03	-3.99		.03	3.99
8. Interaction (Financial rewards X Dummy 1)			-.35 *est-exp*			.35 *exp-est*			-.02 *exp-maint*			-.39 *exp-dis*
9. Interaction (Financial rewards X Dummy 2)			.02 *maint-exp*			.37 *maint-est*			-.37 *est-maint*			-.73 *est-dis*
10. Interaction (Financial rewards X Dummy 3)			.39 *dis-exp*			.73 *dis-est*			.37 *dis-maint*			-.37 *maint-dis*
R^2	.038**	.041**	.048**	.038**	.041**	.048**	.038**	.041**	.048**	.038**	.041**	.048**
ΔR^2	.038**	.003	.007	.038**	.003	.007	.038**	.003	.007	.038**	.003	.007

Notes. N=569. *p<.05 **p<.01. Unstandardized regression coefficients are shown. Standardized coefficients in parentheses.

Table 19. Multiple regression (hypothesis 8: career stage moderator – self-select)

DV: Knowledge asking	Reference group: exploration			Reference group: establishment			Reference group: maintenance			Reference group: disengagement		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
1. Age	.13	.06	.06	.13	.06	.06	.13	.06	.06	.13	.06	.06
2. Org tenure	-.09	-.06	-.06	-.09	-.06	-.06	-.09	-.06	-.06	-.09	-.06	-.06
3. Career tenure	-.05	.01	.00	-.05	-.01	.00	-.05	-.01	.00	-.05	.01	.00
4. Financial rewards for knowledge asking		.45**	.29 (.10)		.45**	.45 (.16)		.45**	.37 (.13)		.45**	.67** (.24)**
5. Career stage (Dummy1)		4.44**	2.44		-4.44**	-2.44		-2.64	-1.58		1.50	5.81
6. Career stage (Dummy2)		2.64	1.58		-1.80	-.86		1.80	-.86		5.94**	8.25
7. Career stage (Dummy3)		-1.50	-5.81		-5.94**	-8.25		-4.14*	-7.39		4.14*	7.39
8. Interaction (Financial rewards X Dummy 1)			.16 *est-exp*			-.16 *exp-est*			-.08 *exp-maint*			-.38 *exp-dis*
9. Interaction (Financial rewards X Dummy 2)			.08 *maint-exp*			-.08 *maint-est*			.08 *est-maint*			-.22 *est-dis*
10. Interaction (Financial rewards X Dummy 3)			.38 *dis-exp*			.22 *dis-est*			.30 *dis-maint*			-.30 *maint-dis*
R^2	.005	.064**	.067**	.005	.064**	.067**	.005	.064**	.067**	.005	.064**	.067**
ΔR^2	.005	.059**	.003	.005	.059**	.003	.005	.059**	.003	.005	.059**	.003

Notes. N=569. *p<.05 **p<.01. Unstandardized regression coefficients are shown. Standardized coefficients in parentheses.

Table 20. Multiple regression (hypothesis 9: career stage moderator – self-select)

DV: Knowledge giving	Reference group: exploration			Reference group: establishment			Reference group: maintenance			Reference group: disengagement		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
1. Age	.05	.03	.06	.05	.03	.06	.05	.03	.06	.05	.03	.06
2. Org tenure	.12	.12	.10	.12	.12	.10	.12	.12	.10	.12	.12	.10
3. Career tenure	.27	.28	.26	.27	.28	.26	.27	.28	.26	.27	.28	.26
4. Non-financial rewards for knowledge giving		.12	-.11 (-.06)		.12	-.13 (-.07)		.12	-.16 (-.09)		.12	.46** (.25)**
5. Career stage (Dummy1)		1.53	2.12		-1.53	-2.12		-.02	-1.89		-.05	21.46**
6. Career stage (Dummy2)		.02	1.89		-1.51	-.23		1.51	.23		1.48	23.58*
7. Career stage (Dummy3)		.05	-21.46**		-1.48	-23.58*		.03	-23.35*		-.03	23.35*
8. Interaction (Non-fin rewards X Dummy 1)			-.02 *est-exp*			.02 *exp-est*			.05 *exp-maint*			-.57** *exp-dis*
9. Interaction (Non-fin rewards X Dummy 2)			-.05 *maint-exp*			-.03 *maint-est*			.03 *est-maint*			-.59* *est-dis*
10. Interaction (Non-fin rewards X Dummy 3)			.57** *dis-exp*			.59* *dis-est*			.62* *dis-maint*			-.62* *maint-dis*
R^2	.038**	.044**	.069**	.038**	.044**	.069**	.038**	.044**	.069**	.038**	.044**	.069**
ΔR^2	.038**	.006	.025**	.038**	.006	.025**	.038**	.006	.025**	.038**	.006	.025**

Notes. N=569. *p<.05 **p<.01. Unstandardized regression coefficients are shown. Standardized coefficients in parentheses.

Table 21. Multiple regression (hypothesis 10: career stage moderator – self-select)

DV: Knowledge asking	Reference group: exploration			Reference group: establishment			Reference group: maintenance			Reference group: disengagement		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
1. Age	.13	.05	.07	.13	.05	.07	.13	.05	.07	.13	.05	.07
2. Org tenure	-.09	-.09	-.10	-.09	-.09	-.10	-.09	-.09	-.10	-.09	-.09	-.10
3. Career tenure	-.05	-.02	-.03	-.05	-.02	-.03	-.05	-.02	-.03	-.05	-.02	-.03
4. Non-financial rewards for knowledge asking		.45**	.43* (.19)*		.45**	.50 (.22)		.45**	.14 (.06)		.45**	.58** (.26)**
5. Career stage (Dummy1)		5.01**	3.06		-5.01**	-3.06		-2.61	-11.07		1.37	5.60
6. Career stage (Dummy2)		2.61	11.07		-2.40	8.01		2.40	-8.01		6.38**	8.65
7. Career stage (Dummy3)		-1.37	-5.59		-6.38**	-8.65		-3.98*	-16.66*		3.98*	16.66*
8. Interaction (Non-fin rewards X Dummy 1)			.07 *est-exp*			-.07 *exp-est*			.29 *exp-maint*			-.15 *exp-dis*
9. Interaction (Non-fin rewards X Dummy 2)			-.29 *maint-exp*			-.36 *maint-est*			.36 *est-maint*			-.09 *est-dis*
10. Interaction (Non-fin rewards X Dummy 3)			.15 *dis-exp*			.09 *dis-est*			.44 *dis-maint*			-.44 *maint-dis*
R^2	.005	.077**	.082**	.005	.077**	.082**	.005	.077**	.082**	.005	.077**	.082**
ΔR^2	.005	.072**	.005	.005	.072**	.005	.005	.072**	.005	.005	.072**	.005

Notes. N=569. *p<.05 **p<.01. Unstandardized regression coefficients are shown. Standardized coefficients in parentheses.

Table 22. Multiple regression (hypothesis 7: career stage moderator – Likert ACCI items)

DV: Knowledge giving	Reference group: exploration			Reference group: establishment			Reference group: maintenance			Reference group: disengagement		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
1. Age	.07	.04	.04	.07	.04	.04	.07	.04	.04	.07	.04	.04
2. Org tenure	.05	.07	.07	.05	.07	.07	.05	.07	.07	.05	.07	.07
3. Career tenure	.25	.24	.24	.25	.24	.24	.25	.24	.24	.25	.24	.24
4. Financial rewards for knowledge giving		-.03	.03 (.01)		-.03	-.04 (-.02)		-.03	-.09 (-.03)		-.03	-.12 (-.04)
5. Career stage (Dummy1)		.49	1.24		-.49	-1.24		-.74	-1.95		6.55**	5.17
6. Career stage (Dummy2)		.74	1.95		.25	.72		-.25	-.72		7.03**	6.41
7. Career stage (Dummy3)		-6.55**	-5.17		-7.03**	-6.41		-7.29*	-7.13		7.29*	7.13
8. Interaction (Financial rewards X Dummy 1)			-.07 *est-exp*			.07 *exp-est*			.11 *exp-maint*			.14 *exp-dis*
9. Interaction (Financial rewards X Dummy 2)			-.11 *maint-exp*			-.05 *maint-est*			.05 *est-maint*			.07 *est-dis*
10. Interaction (Financial rewards X Dummy 3)			-.14 *dis-exp*			-.07 *dis-est*			-.03 *dis-maint*			.03 *maint-dis*
R^2	.041**	.070**	.070**	.041**	.070**	.070**	.041**	.070**	.070**	.041**	.070**	.070**
ΔR^2	.041**	.028*	.000	.041**	.028*	.000	.041**	.028*	.000	.041**	.028*	.000

Notes. N=453. *p<.05 **p<.01. Unstandardized regression coefficients are shown. Standardized coefficients in parentheses.

Table 23. Multiple regression (hypothesis 8: career stage moderator – Likert ACCI items)

DV: Knowledge asking	Reference group: exploration			Reference group: establishment			Reference group: maintenance			Reference group: disengagement		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
1. Age	.17	.10	.13	.17	.10	.13	.17	.10	.13	.17	.10	.13
2. Org tenure	-.10	-.08	-.12	-.10	-.08	-.12	-.10	-.08	-.12	-.10	-.08	-.12
3. Career tenure	-.11	-.11	-.12	-.11	-.11	-.12	-.11	-.11	-.12	-.11	-.11	-.12
4. Financial rewards for knowledge asking		.21	.08 (.03)		.21	.38 (.14)		.21	-.40 (-.15)		.21	.41 (.15)
5. Career stage (Dummy1)		3.77**	.00		-3.77**	-.00		-4.60	-9.44		6.18**	9.64
6. Career stage (Dummy2)		4.60	9.44		.83	9.44		-.83	-9.44		9.95**	9.64
7. Career stage (Dummy3)		-6.18**	-9.64		-9.95**	-9.64		-10.78**	-19.08**		10.78**	19.08**
8. Interaction (Financial rewards X Dummy 1)			.31 *est-exp*			-.31 *exp-est*			.48 *exp-maint*			-.33 *exp-dis*
9. Interaction (Financial rewards X Dummy 2)			-.48 *maint-exp*			-.79 *maint-est*			.79 *est-maint*			-.02 *est-dis*
10. Interaction (Financial rewards X Dummy 3)			.33 *dis-exp*			.02 *dis-est*			.81 *dis-maint*			-.81 *maint-dis*
R^2	.007	.079**	.085**	.007	.079**	.085**	.007	.079**	.085**	.007	.079**	.085**
ΔR^2	.007	.072**	.006	.007	.072**	.006	.007	.072**	.006	.007	.072**	.006

Notes. N=453. *p<.05 **p<.01. Unstandardized regression coefficients are shown. Standardized coefficients in parentheses.

Table 24. Multiple regression (hypothesis 9: career stage moderator – Likert ACCI items)

DV: Knowledge giving	Reference group: exploration			Reference group: establishment			Reference group: maintenance			Reference group: disengagement		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
1. Age	.07	.04	.01	.07	.04	.01	.07	.04	.01	.07	.04	.01
2. Org tenure	.05	.07	.08	.05	.07	.08	.05	.07	.08	.05	.07	.08
3. Career tenure	.25	.24	.27	.25	.24	.27	.25	.24	.27	.25	.24	.27
4. Non-financial rewards for knowledge giving		-.03	-.26 (-.13)		-.03	-.20 (-.10)		-.03	-.01 (-.00)		-.03	.66 (.34)**
5. Career stage (Dummy1)		.44	-1.64		-.44	1.64		-.73	8.94		6.57**	40.56**
6. Career stage (Dummy2)		.73	-8.94		.30	-7.31		-.30	7.31		7.00*	38.92**
7. Career stage (Dummy3)		-6.57**	-40.56**		-7.00**	-38.92**		-7.30*	-31.62*		7.30*	31.62*
8. Interaction (Non-fin rewards X Dummy 1)			.06 *est-exp*			-.06 *exp-est*			-.25 *exp-maint*			-.92** *exp-dis*
9. Interaction (Non-fin rewards X Dummy 2)			.25 *maint-exp*			.20 *maint-est*			-.20 *est-maint*			-.86** *est-dis*
10. Interaction (Non-fin rewards X Dummy 3)			.92** *dis-exp*			.86** *dis-est*			.67 *dis-maint*			-.67 *maint-dis*
R^2	.041**	.070**	.102**	.041**	.070**	.102**	.041**	.070**	.102**	.041**	.070**	.102**
ΔR^2	.041**	.028**	.030**	.041**	.028**	.030**	.041**	.028**	.030**	.041**	.028**	.030**

Notes. N=453. *p<.05 **p<.01. Unstandardized regression coefficients are shown. Standardized coefficients in parentheses.

Table 25. Multiple regression (hypothesis 10: career stage moderator – Likert ACCI items)

DV: Knowledge asking	Reference group: exploration			Reference group: establishment			Reference group: maintenance			Reference group: disengagement		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
1. Age	.17	.09	.09	.17	.09	.09	.17	.09	.09	.17	.09	.09
2. Org tenure	-.10	-.08	-.07	-.10	-.08	-.07	-.10	-.08	-.07	-.10	-.08	-.07
3. Career tenure	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11	-.11
4. Non-financial rewards for knowledge asking		.18	.17 (.07)		.18	.13 (.06)		.18	.09 (.04)		.18	.35 (.14)
5. Career stage (Dummy1)		4.05**	5.22		-4.05**	-5.22		-4.56	-6.86		6.03**	10.68
6. Career stage (Dummy2)		4.56	6.86		.51	1.64		-.51	-1.64		10.09**	15.90
7. Career stage (Dummy3)		-6.03**	-10.68		-10.09**	-15.90		-10.60**	-17.54		10.60**	17.54
8. Interaction (Non-fin rewards X Dummy 1)			-.04 *est-exp*			.04 *exp-est*			.08 *exp-maint*			-.17 *exp-dis*
9. Interaction (Non-fin rewards X Dummy 2)			-.08 *maint-exp*			-.04 *maint-est*			.04 *est-maint*			-.21 *est-dis*
10. Interaction (Non-fin rewards X Dummy 3)			.17 *dis-exp*			.21 *dis-est*			.25 *dis-maint*			-.25 *maint-dis*
R^2	.007	.079**	.080**	.007	.079**	.080**	.007	.079**	.080**	.007	.079**	.080**
ΔR^2	.007	.072**	.001	.007	.072**	.001	.007	.072**	.001	.007	.072**	.001

Notes. N=453. *p<.05 **p<.01. Unstandardized regression coefficients are shown. Standardized coefficients in parentheses.

Table 26. Summary of results

Purpose 1: Clarify the factor structure of knowledge sharing behavior	
Supported	H1: Knowledge sharing behavior is a multidimensional construct.
Purpose 2: Clarify the factor structure of rewards for knowledge sharing	
Supported	H2: Rewards for knowledge sharing is a multidimensional construct.
Purpose 3: Clarify the relationships between rewards and knowledge sharing behavior	
Not supported	H3: Non-financial rewards (e.g., getting a sense of satisfaction or rewarding feeling) exhibit a positive relationship with knowledge **giving**.
Supported	H4: Non-financial rewards (e.g., getting a sense of satisfaction or rewarding feeling) exhibit a positive relationship with knowledge **asking**.
Not supported	H5: Financial rewards (e.g., pay or promotion) exhibit a positive relationship with knowledge **giving**.
Supported	H6: Financial rewards (e.g., pay or promotion) exhibit a positive relationship with knowledge **asking**.
Not supported	H7: Career stage moderates the relationship between financial rewards and knowledge giving.
Not supported	H8: Career stage moderates the relationship between financial rewards and knowledge asking.
Partially supported	H9: Career stage moderates the relationship between non-financial rewards and knowledge giving.
Not supported	H10: Career stage moderates the relationship between non-financial rewards and knowledge asking.
Purpose 4: Clarify the relationships between goal orientations and knowledge sharing behavior	
Supported	H11: Learning goal orientation exhibits a positive relationship with knowledge **giving**.
Supported	H12: Learning goal orientation exhibits a positive relationship with knowledge **asking**.
Not supported	H13: Performance **prove** goal orientation exhibits a positive relationship with knowledge giving.
Supported	H14: Performance **avoid** goal orientation exhibits a negative relationship with knowledge giving.
Supported	H15: Organizational learning culture moderates the relationship between **performance avoid** goal orientation and knowledge **giving**, such that the relationship is weaker in a strong culture.
Not supported	H16: Non-financial rewards moderate the relationship between **performance prove** goal orientation and knowledge **giving**, such that the relationship is stronger with more rewards.

Table 27. CFA fit indices for new scales

Model	χ^2	df	p-value	RMSEA	90% CI	CFI	TLI	SRMR
2-factor knowledge sharing behavior	714.694	134	0.000	.087	.081, .094	.951	.944	.034
1-factor organizational learning culture	54.153	9	0.000	.094	.071, .119	.943	.905	.038
2-factor knowledge giving rewards	161.228	43	0.000	.070	.058, .081	.954	.941	.036
2-factor knowledge asking rewards	61.267	26	0.000	.049	.033, .065	.985	.980	.033

Note. N = 569.

Figures

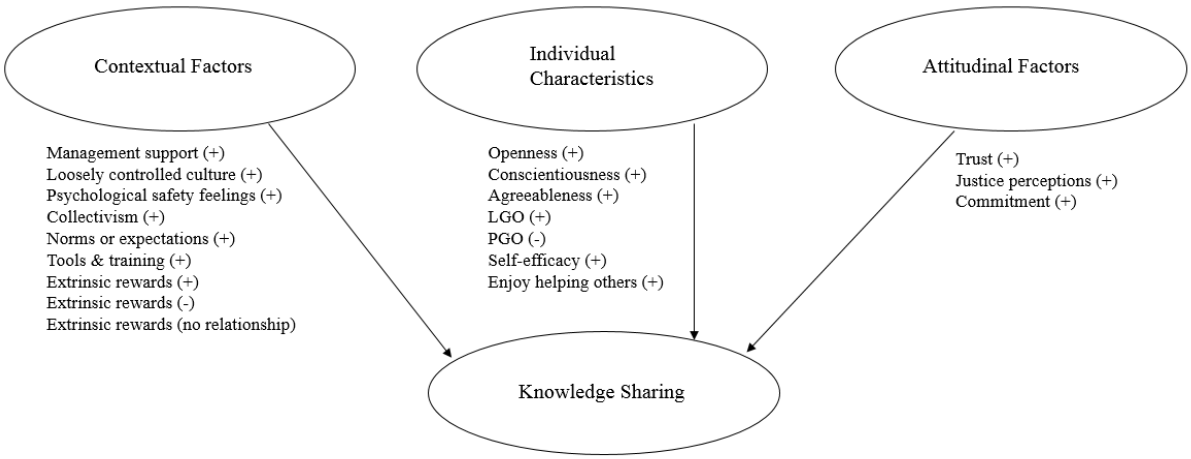

Figure 1. Summary of relationships found in literature review

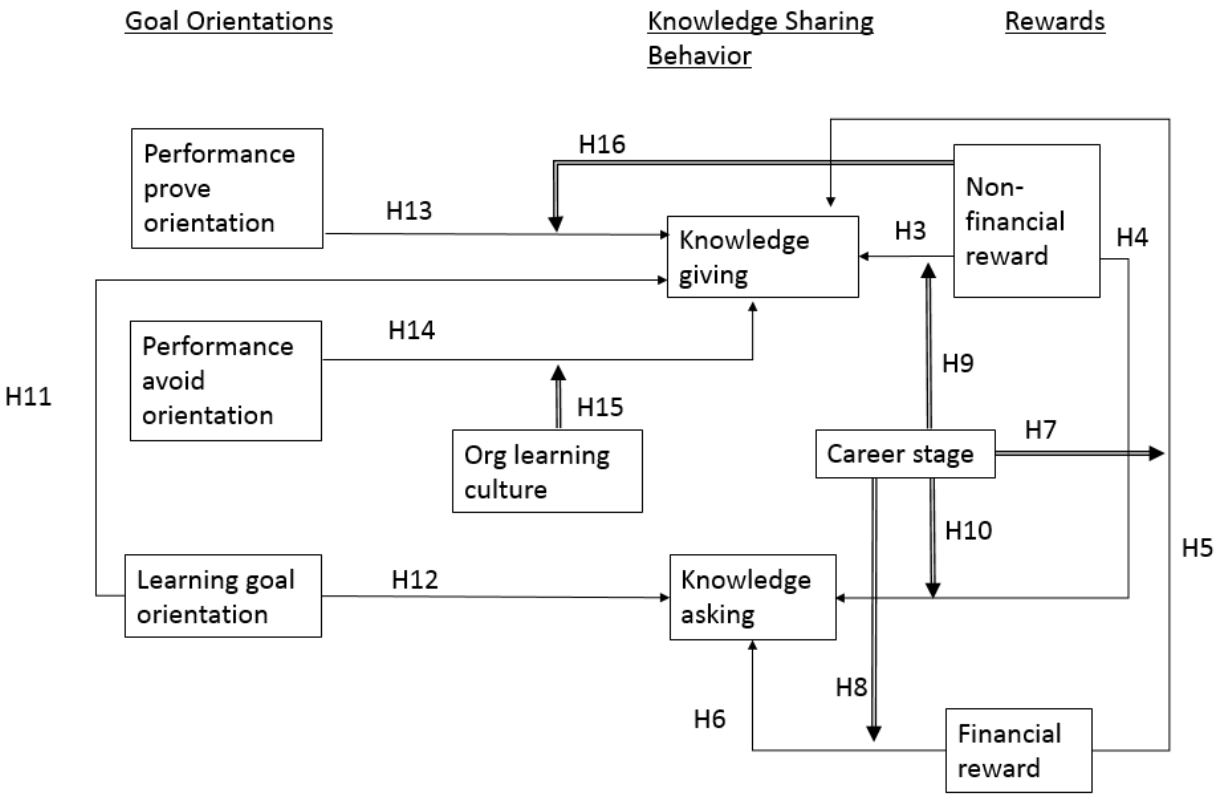

Figure 2. Hypothesized relationships among study variables

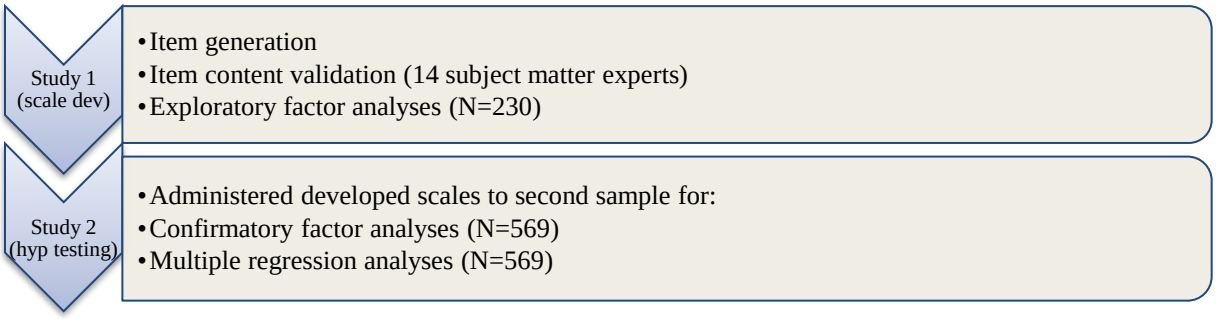

Figure 3. Complete study procedure flow chart

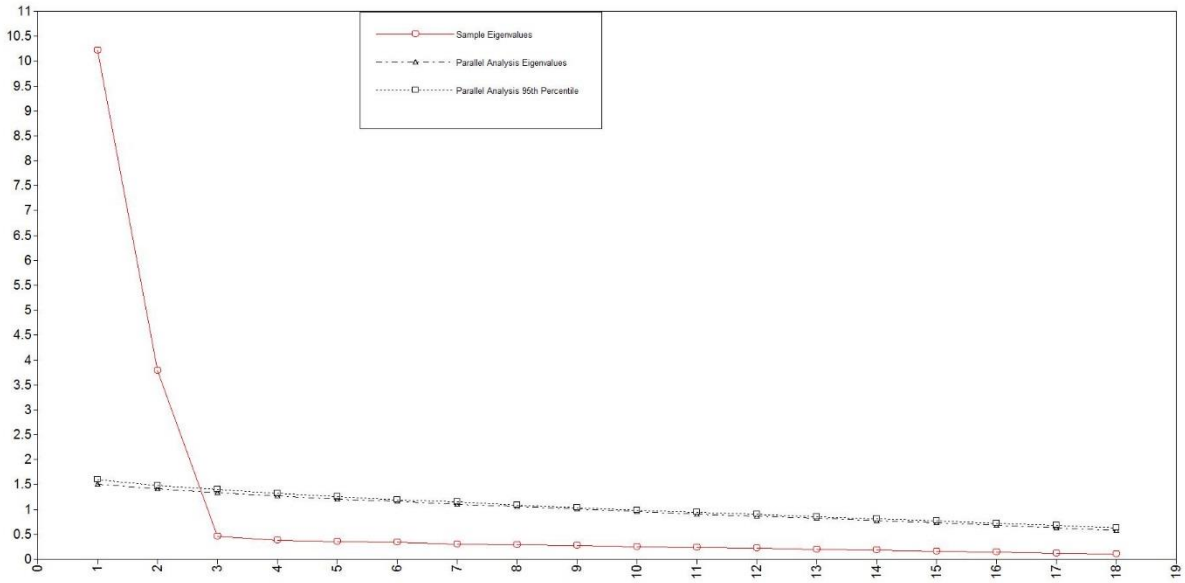

Figure 4. Scree plot for final knowledge sharing behavior scale

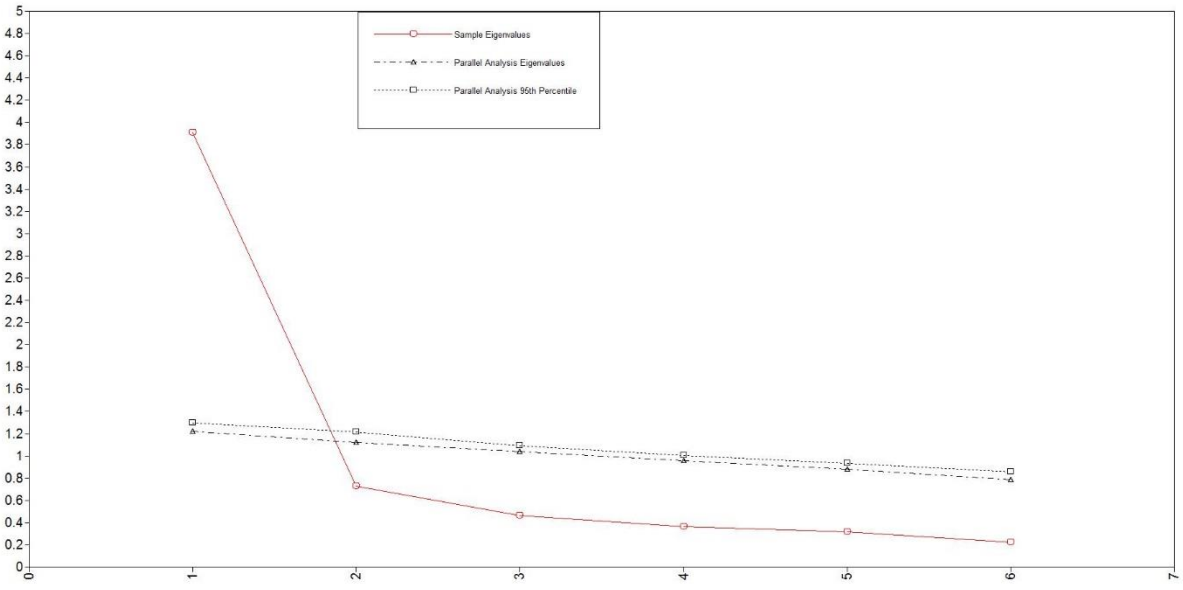

Figure 5. Scree plot for final organizational learning culture scale

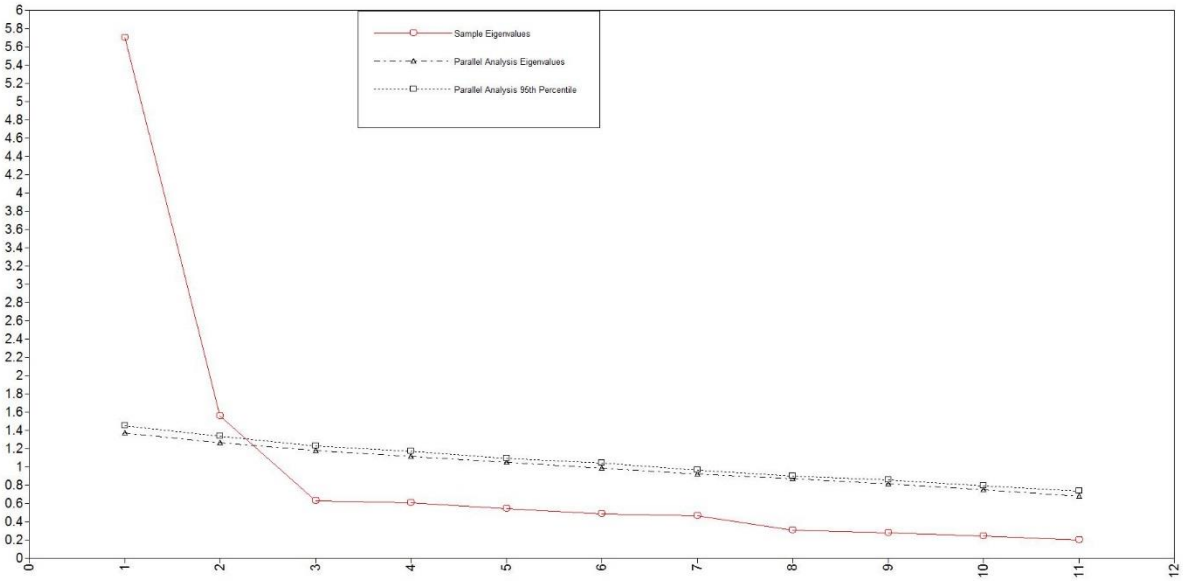

Figure 6. Scree plot for final rewards for knowledge giving scale

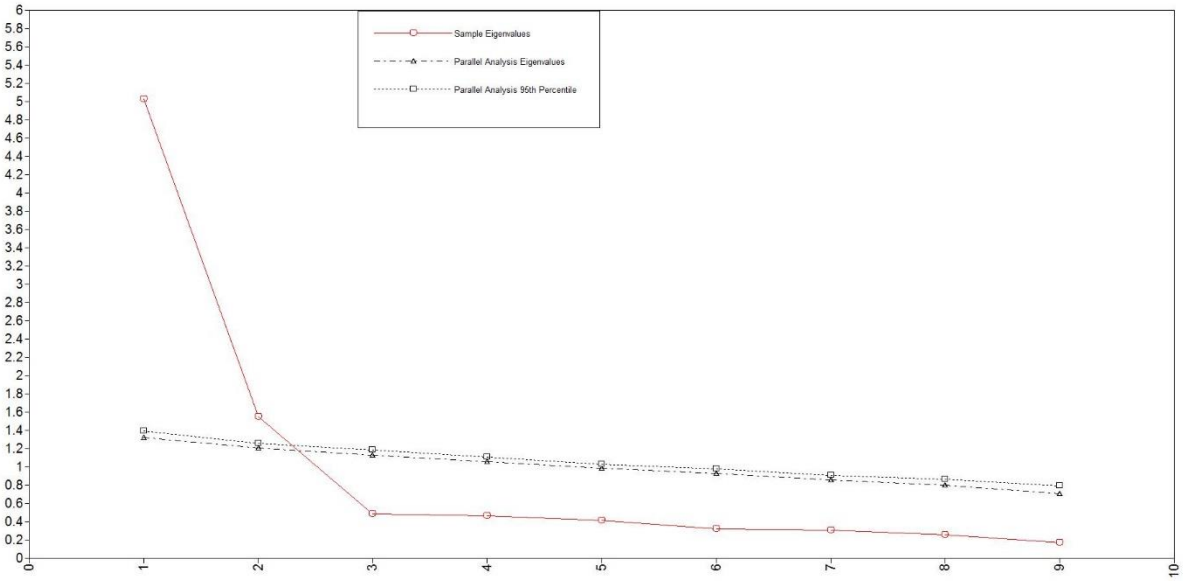

Figure 7. Scree plot for final rewards for knowledge asking scale

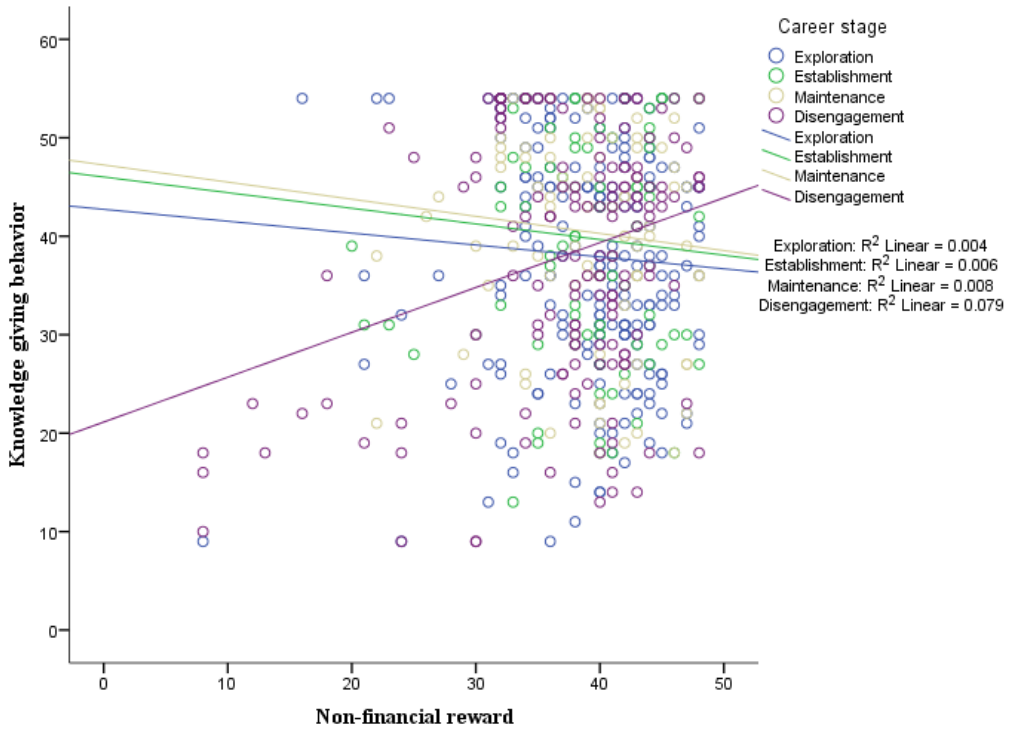

Figure 8. Career stage moderator (hypothesis 9)

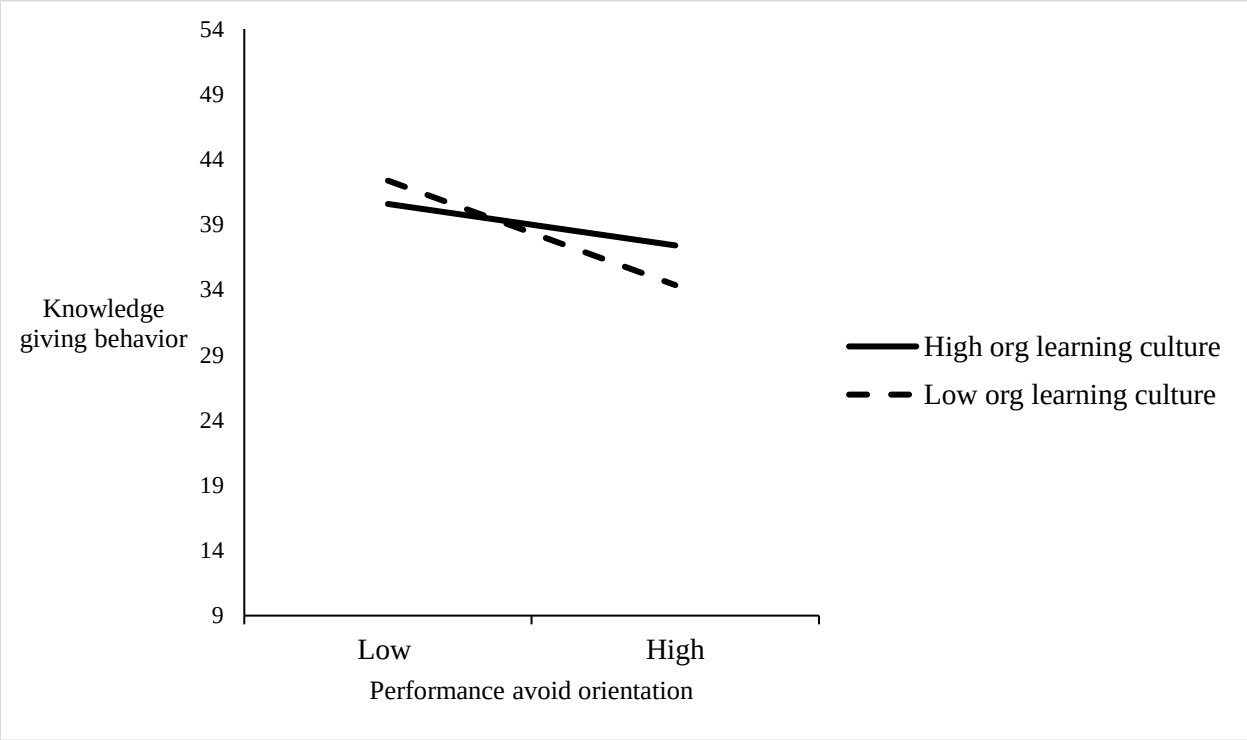

Figure 9. Organizational learning culture moderator (hypothesis 15)

Notes. Knowledge giving as a function of performance avoid for different levels of organizational leaning culture. Centered variables were used. High represents one standard deviation above the mean. Low represents one standard deviation below the mean.

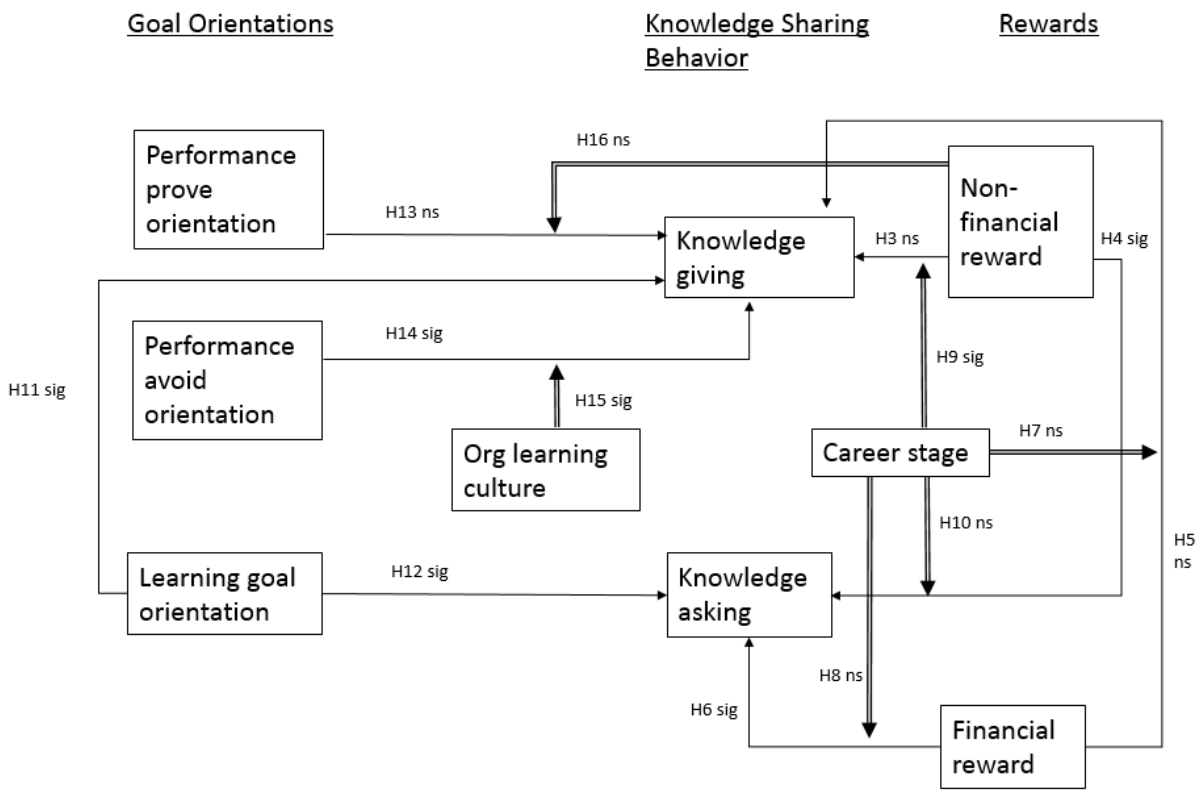

Figure 10. Summary of study results

Appendices

Appendix A: IRB approval for study 1

UNIVERSITY OF SOUTH FLORIDA

RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX(813)974-7091

September 22, 2017

Tiffany Lee, B.A.
Psychology
4202 East Fowler Ave, PCD4118G
Tampa, FL 33620

RE: **Exempt Certification**
IRB#: Pro00032182
Title: Scale Development for Informal Learning in Organizations

Dear Ms. Lee:

On 9/22/2017, the Institutional Review Board (IRB) determined that your research meets criteria for exemption from the federal regulations as outlined by 45CFR46.101(b):

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:
(i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

As the principal investigator for this study, it is your responsibility to ensure that this research is conducted as outlined in your application and consistent with the ethical principles outlined in the Belmont Report and with USF HRPP policies and procedures.

Please note, as per USF HRPP Policy, once the Exempt determination is made, the application is closed in ARC. Any proposed or anticipated changes to the study design that was previously declared exempt from IRB review must be submitted to the IRB as a new study prior to initiation of the change. However, administrative changes, including changes in research personnel, do not warrant an amendment or new application.

Given the determination of exemption, this application is being closed in ARC. This does not limit your ability to conduct your research project.

We appreciate your dedication to the ethical conduct of human subject research at the University

of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

Kristen Salomon, Ph.D., Vice Chairperson
USF Institutional Review Board

Appendix B: IRB approval for study 2

USF
UNIVERSITY OF
SOUTH FLORIDA

RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX(813) 974-7091

January 18, 2018

Tiffany Lee, M.A.
Psychology
4202 East Fowler Ave, PCD4118G
Tampa, FL 33620

RE: **Exempt Certification**
IRB#: Pro00033255
Title: An Examination of Knowledge Exchange in Organizations

Dear Ms. Lee:

On 1/18/2018, the Institutional Review Board (IRB) determined that your research meets criteria for exemption from the federal regulations as outlined by 45CFR46.101(b):

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:
(i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

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Sincerely,

Kristen Salomon, Ph.D., Vice Chairperson
USF Institutional Review Board