

**The relationship between tenacity and knowledge exchange in a Mexican organization:
Moderating effects of within-work and work–family role conflict**

Abstract

This study considers how employees' tenacity might enhance their propensity to engage in knowledge exchange with organizational peers, as well as how the positive tenacity–knowledge exchange relationship is invigorated by two types of role conflict: within-work and between work and family. Using data from a large Mexican organization in the logistics sector, this study shows that tenacity increases knowledge exchange, and this effect is stronger at higher levels of within-work and work–family role conflict. The invigorating role of within-work role conflict is particularly salient when work–family role conflict is high. These findings inform organizations that the application of personal energy to knowledge-enhancing activities is particularly useful when employees encounter severe workplace adversity because of conflicting role demands.

Keywords: tenacity; knowledge exchange; role conflict

Introduction

Knowledge exchange is a key resource that fuels positive work outcomes such as learning and creativity, due to its links to the ability to create *new* insights into how to improve the current organizational situation (Chiang, Hsu, & Shih, 2015; Gong, Kim, Lee, & Zhu, 2013; Nonaka & Takeuchi, 1995). It reflects the presence of bidirectional knowledge flows among employees, encompassing both the provision of knowledge to others and efforts to gauge the knowledge held by those others (Wang & Noe, 2010). Employees' exposure to disparate knowledge through extensive exchange behaviors then is an instrumental building block for further resource accumulation that benefits both employees and their organizations (Cogliser, Gardner, Trank, Gavin, Halbesleben, & Seers, 2013; Yang, Gong, & Huo, 2011).

Despite these possible benefits, promoting extensive knowledge exchange is a challenging task. For example, the free exchange of valuable knowledge may cause employees to feel as if they were relinquishing power and working against their own interests (Boh & Wong, 2015; Kim & Mauborgne, 1998; Liu & DeFrank, 2013), especially if they regard their individual knowledge as an asset that needs protection from undue appropriation by others (Cabrera & Cabrera, 2002; Luo, Slotegraaf, & Pan, 2006; Tsai, 2002). Extensive knowledge exchange also might signal weakness or become a source of reputation loss if the shared knowledge is biased or erroneous (Gong et al., 2013).

In this study, we propose that an important catalyst for “unlocking” individual knowledge from its holders—in the form of extensive knowledge exchange and despite its challenges—stems from employees' tenacity levels (Baum & Locke, 2004). Tenacity is a personal characteristic that reflects employees' sustained allocation of goal-directed energy to work tasks (Baum & Locke, 2004). Previous research has not considered how tenacity might influence the

likelihood that employees engage in knowledge-exchange behaviors. This gap represents a substantial oversight. Tenacity can provide employees with the necessary energy to interact with colleagues and share personal insights with them (Baum & Locke, 2004; Quinn, Spreitzer, & Lam, 2012), as well as to obtain useful knowledge from those colleagues (Guenter, van Emmerik, & Schreurs, 2014; Wang & Noe, 2010).

Moreover, it is useful to understand the conditions in which tenacity's positive role in spurring knowledge exchange may be most prominent, so that organizations can judge *when* the allocation of personal effort to knowledge exchange activities returns the greatest value (Boh & Wong, 2015; Kuvaas, Buch, & Dysvik, 2012). To this end, we theorize about how two critical sources of workplace adversity—conflict within work roles and conflict between work and family roles (Ngo, Foley, & Loi, 2005; Singh, Suar, & Leiter, 2012)—may invigorate the positive effect of tenacity on knowledge exchange.

In particular, we predict that the positive relationship between tenacity and knowledge exchange is more pronounced to the extent (1) that employees encounter conflicting demands in the different work roles that they must fulfill (Ralston et al., 2010) and (2) that their work obligations spill over to their home life, such that their ability to meet family responsibilities is compromised (Jawahar, Kisamore, Stone, & Rahn, 2012). The rationale for predicting these invigorating effects comes from conservation of resources (COR) theory. This theory stipulates that the application of personal energy to gain resources, such as those achieved through extensive knowledge exchanges, is particularly valuable when these gains can help protect against anticipated resource losses due to stressful work situations (Hobfoll, 1989, 2001).

In short, we examine a hitherto unexplored phenomenon: how employees' tenacity enhances their propensity to exchange knowledge with one another. We also propose that this

process is especially important when employees confront significant workplace adversity, in the form of within-work role conflict and work–family role conflict. Our key objective therefore is to understand how and when tenacity enhances employees’ propensity to exchange knowledge with their peers.

The empirical setting of this study is a Mexican organization. Previous research calls for more studies that explain the likelihood of intra-organizational knowledge exchange in less commonly studied country settings (Wang & Noe, 2010). Compared with the more frequently investigated U.S. setting, people in an uncertainty-avoidant culture such as Mexico may be particularly sensitive to workplace stress (Hofstede, 2001), such that they are strongly affected by the adversity that comes with conflicting roles. Thus, the perceived usefulness of allocating personal energy to extensive knowledge exchange activities in role conflict situations might be particularly potent in a country such as Mexico.

Theoretical background

Knowledge exchange in organizations

Knowledge exchange reflects the extent to which employees share opinions, suggestions, or ideas that are relevant for task execution with one another (Henry, 1995; Langfred & Moye, 2014). This bidirectional process includes the propensity of employees to provide knowledge to others *and* to convince others to share their own knowledge (Wang & Noe, 2010).¹ Knowledge exchange is a critical work behavior, because it determines how knowledge that is dispersed across the organization gets combined to generate *new* knowledge (Boh & Wong, 2015; Liu &

¹ As Wang and Noe (2010) explain in their comprehensive review, the terms “knowledge exchange” and “knowledge sharing” are often used interchangeably, even if they are not identical. Knowledge sharing refers to employees providing knowledge to others, whereas knowledge exchange is broader and includes both knowledge sharing with others *and* knowledge seeking from others. Consistent with prior research (Bartol & Srivastava, 2002; Huber, 1991), we do not distinguish between knowledge and information. We conceptualize knowledge as information that has been processed by employees (cf. Wang & Noe, 2010).

Liu, 2011). Knowledge exchange can lead to positive outcomes such as enhanced individual creativity (Chiang et al., 2015), group performance (Moye & Langfred, 2004), and the organization's competitive advantage (Grant, 1996).

Previous research details various factors that can increase the likelihood that employees share their knowledge with others (for a review, see Wang & Noe, 2010): organizational context factors such as the organizational culture (De Long & Fahey, 2000) and rewards systems (Quigley, Tesluk, Locke, & Bartol, 2007; Yao, Kam, & Chan, 2007); interpersonal factors such as task and relationship conflict (Chen, Zhang, & Vogel, 2011; Devine, 1999); team factors such as team cohesiveness (Bakker, Leenders, Gabbay, Kratzer, & Van Engelen, 2006) and team diversity (Sawng, Kim, & Han, 2006); and individual factors such as exchange ideology (Lin, 2007), pro-social or pro-self motivations (Steinel, Utz, & Koning, 2010), and openness to new experiences (Cabrera, Collins, & Salgado, 2006).

Significantly, undertaking extensive knowledge exchange efforts consumes high levels of energy (Quinn et al., 2012), and these efforts can be risky to the extent that they lead to a loss of personal power when employees "give away" valuable knowledge for which others take undue credit (Boh & Wong, 2015; Cabrera & Cabrera, 2002; Kim & Mauborgne, 1998). Extensive knowledge exchanges also might lead to reputation loss (Gong et al., 2013). For example, to the extent that employees spend significant time exchanging knowledge that does not contribute to their organization's well-being, their knowledge exchange activities may seem redundant and undermine their standing in the organization (Zhou & George, 2001). In short, there are significant disadvantages associated with engaging in extensive knowledge exchange, so it is important to understand why some employees are more likely than others to exchange knowledge despite these disadvantages (Cabrera & Cabrera, 2002, 2005; Wang & Noe, 2010).

Tenacity

Because of the challenges that come with extensive knowledge exchange, and particularly the sustained energy needed to address these challenges (Boh & Wong, 2015; Swart, Kinnie, van Rossenberg, & Yalabik, 2014), it is important to understand how employees' personal energy reservoirs may stimulate knowledge exchanges. Previous research on the role of individual resources in stimulating knowledge exchange is somewhat limited (Wang & Noe, 2010). Notably, it has not considered how employees' tenacity, or tendency to relentlessly allocate sustained energy to work tasks, might spur extensive knowledge exchanges with colleagues, irrespective of the challenges that these activities may encounter. This research gap is significant because of the resistance that employees often exhibit to sharing their personal knowledge with others and the challenge of convincing others to share their own knowledge (Boh & Wong, 2015; Cabrera & Cabrera, 2005; Liu & DeFrank, 2013; Wang & Noe, 2010).

Tenacity reflects employees' "sustained goal-directed action and energy even when faced with obstacles" (Baum & Locke, 2004, p. 588). This personal characteristic has some overlap with constructs such as resilience, which reflects the capacity to bounce back from challenging work situations (Luthans, 2002), or conscientiousness, which is the extent to which people are reliable, hard-working, and well organized (Crant, Kim, & Wang, 2011). However, tenacity also differs from those notions. Resilience and conscientiousness are more short-term oriented, reflecting concerns about how to *react* to challenging work situations, in the case of resilience (Sweetman, Luthans, Avey, & Luthans, 2011), or the desire to control the *immediate* outcomes of one's actions, in the case of conscientiousness (Duckworth, Peterson, Mathews, & Kelly, 2007). Tenacity instead focuses on employees' persistence in sustaining long-term efforts, even in the face of workplace adversity (Baum & Locke, 2004).

Although tenacity has attracted some attention in previous organization behavior research, highlighting its role in spurring successful leadership (Bass & Stogdill, 1990; House & Shamir, 1993), it mostly has been applied to entrepreneurship. For example, Baum and Locke (2004) find that higher tenacity levels lead to greater venture growth, by stimulating entrepreneurs' new resource skills, self-efficacy, and vision communication. Entrepreneurs' tenacity also reduces investors' perceptions of the risk that their funds will not be effectively used by the entrepreneurs (Allison, McKenny, & Short, 2013). To complement this research, we propose that tenacity can play a critical role in influencing the likelihood that employees engage in high levels of knowledge exchange with one another.

To develop our arguments about the positive connection between tenacity and knowledge exchange, we draw from conservation of resources (COR) theory. This theory emphasizes the relevance of anticipated resource gains for explaining positive workplace behaviors (Hobfoll, 1989, 2001). In particular, personal resources exert a motivating effect, because they stimulate the generation of additional resources (Hobfoll, 1989, 2011). Similarly, we posit that the exchange of knowledge with organizational peers and the related anticipation of novel insights into how to meet job requirements is a critical path for resource generation (Gong et al., 2013). Based on COR theory, we expect that tenacity functions as a critical personal resource that stimulates further resource accumulation through engagement in extensive knowledge exchange.

Role conflict

We also propose that the knowledge gains that tenacious employees may expect from their exchanges with their organizational peers should be *invigorated* when they experience significant stress in role conflict situations (Eatough, Chang, Miloslavic, & Johnson, 2011; Grant-Vallone & Donaldson, 2001; Kahn, 1978). This prediction might seem counterintuitive,

but it is consistent with COR theory. That is, COR theory emphasizes the significant stress that employees experience when adverse work conditions undermine their current resource bases and associated ability to meet their job requirements (Hobfoll, 1989). In the presence of such workplace adversity, investing personal resources into positive work behaviors has particularly high value (Hobfoll & Lilly, 1993; Hobfoll & Shirom, 2000). Thus, leveraging tenacity to gain knowledge, through productive exchanges with organizational peers, should be perceived as particularly useful when these gains can help employees maintain adequate job performance despite the stress of coping with opposing role demands.

We consider two critical facets of role conflict: within-work role conflict (typically labeled “role conflict”) and work–family role conflict (typically labeled “work–family conflict”). First, within-work role conflict captures conflicting demands across different work responsibilities, such as when employees receive incompatible requests from different organizational stakeholders (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964). When employees experience conflicting work role demands, they experience high levels of stress, because they believe, for example, that they have to break organizational rules to perform their job tasks successfully (Hutchinson & Purcell, 2010). Second, work–family role conflict captures another source of stress. It arises when employees’ work obligations undermine their ability to fulfill their family responsibilities (Burke, 1986; Eby, Casper, Lockwood, Bordeaux, & Brinley, 2005; Wang, Lawler, & Shi, 2010). This facet acknowledges that conflict exists not only across different work-related roles but also between the work and family spheres (Fiksenbaum, 2014; Greenhaus & Beutell, 1985). It speaks to the tension between work and family obligations, such that certain job requirements may prevent employees from spending sufficient time with their family for example (Martins, Eddleston, & Veiga, 2002).

The two types of role conflict (within-work and between work and family) present a concise yet comprehensive picture of how employees' exposure to severe workplace adversity may increase their motivation to leverage their tenacity to achieve knowledge exchanges. This process is informed by their anticipation that the associated knowledge gains will counter the risk of inadequate job performance due to the role conflict (Hobfoll & Lilly, 1993; Hobfoll & Shirom, 2000).

Conceptual framework

Our conceptual framework and its constitutive hypotheses are shown in Figure 1. The baseline relationship pertains to the link between employees' tenacity and knowledge exchange. We explicate the potential moderation of this relationship by the two sources of role conflict: within work roles and between work and family roles. By considering the greater usefulness of tenacity for spurring knowledge exchange in the presence of adverse work situations, we extend previous research that focuses on the *direct* effects of workplace adversity on the likelihood of knowledge exchange. These studies indicate that limited time or lack of familiarity with certain tasks might increase the perceived cost of knowledge sharing (Hew & Hara, 2007) or that work–family conflict negatively influences knowledge sharing (Kim, Lee, Park, & Yun, 2015). Instead, by considering the interplay of tenacity with different role conflict types, we respond to calls to consider the *interaction* of personal and contextual factors to explain knowledge exchange (Wang & Noe, 2010).

[Insert Figure 1 about here]

Figure 1 also suggests that the usefulness of employees' tenacity for knowledge exchange when they experience within-work role conflict is highest if they *simultaneously* confront conflict between their work and family roles. That is, we acknowledge the possible

interdependence of different role conflict types, in terms of how they invigorate the beneficial effect of tenacity. This approach has received little attention in previous applications of COR theory (Hobfoll, 2011; Wright & Hobfoll, 2004). In particular, we postulate that the invigorating effect of within-work role conflict on the tenacity–knowledge exchange relationship is stronger when work–family conflict also is high. Previous research has considered the mutual interdependence of work and family stress—and indicated the bidirectionality of work–family and family–work conflict (Frone, Russell, & Cooper, 1992; Gutek, Searle, & Klepa, 1991)—but not the combined effects of role conflict experienced at work and between work and family on employees’ personal resource uses. Our investigation of the combined, moderating effects of both role conflict types on the tenacity–knowledge exchange relationship addresses this gap, thereby providing new insights into the interwoven nature of work and family obligations.

Hypotheses

Tenacity and knowledge exchange

Using COR theory as a basis, we predict a positive relationship between employees’ tenacity levels and their propensity to exchange knowledge with colleagues. Tenacity increases employees’ propensity to combine their own knowledge bases with those of others, because the allocation of their personal energy to these activities enables them to gain additional insights into how they can meet their job requirements (Baum & Locke, 2004; Hobfoll, 2001). The positive effect of tenacity in enhancing knowledge exchange also implies a role of self-regulation (Bandura & Locke, 2003). Tenacious people proactively set challenging goals for themselves that exceed their current performance (Baum & Locke, 2004). Such goal setting should fuel their additional effort to expand their current knowledge set to achieve the goals. For example, employees with higher tenacity scores may be more likely to engage in extensive knowledge exchange with colleagues, because they have an enhanced propensity for proactive learning and

personal growth. They can accomplish these goals through effective combinations of knowledge with colleagues (Baum & Locke, 2004; Grant, 1996).

Tenacity also means that employees do not give up, even if their work efforts are met with skepticism or resistance (Baum & Locke, 2004). Organizational peers may resist openly sharing their knowledge, especially if different areas of the organization compete for the same resources to achieve personal goals that are at the odds with others' goals (Luo et al., 2006; Tsai, 2002). When employees are tenacious though, they are more likely to persist in convincing organizational peers to share their own expertise and insights, despite their initial resistance (Baum & Locke, 2004). Thus, tenacity bestows employees with the energy to gauge knowledge from their colleagues and persevere in these endeavors, despite the presence of possible peer resistance to extensive knowledge sharing (Zhou & George, 2001). Conversely, employees with low levels of tenacity are less likely to persevere in gauging knowledge from organizational peers. To the extent that employees have limited tenacity, they do not go out of their way to stimulate extensive knowledge exchange with peers.

Hypothesis 1: There is a positive relationship between tenacity and knowledge exchange.

Moderating role of within-work role conflict

Within-work role conflict reflects the extent to which employees experience conflicting demands when executing different work roles in their organization (Kahn et al., 1964). We expect that the usefulness of tenacity for spurring knowledge exchange increases to the extent that role conflict is high. When employees are exposed to conflicting expectations about what they should do in the workplace and fear that they cannot perform their jobs adequately, they should benefit from others' insights into how to cope with conflict-laden situations (Liu & Liu, 2011). This outcome should motivate them to leverage their tenacity into combining their own

knowledge with that of colleagues. Thus, the positive interaction effect between tenacity and within-work role conflict on knowledge exchange reflects the prediction that tenacious employees view the accumulation of knowledge gains, gathered through productive exchanges with peers, as effective means to cope with the stress of possible underperformance due to conflicting role demands at work (Hobfoll, 1989). The more challenging their work situation is, due to conflicting work role obligations, the more valuable it is to apply their tenacity to engage in extensive knowledge exchanges with colleagues.

Similarly, when employees experience stress because their work activities are acceptable to some organizational members but not to others, they experience a stronger need to allocate substantial personal energy to finding *creative* solutions that reconcile these opposing role expectations (Chen, Liu, & Tjosvold, 2005; Zhang, Cao, & Tjosvold, 2011). Conversely, in the absence of within-work role conflict, it is easier for employees to fulfill their job obligations. Applying personal energy to generate novel knowledge combinations with colleagues is less necessary (Ralston et al., 2010). In this situation, the anticipated value of tenacity for developing creative solutions, through extensive knowledge exchange with peers, is lower.

Finally, the propensity of tenacious employees to interact extensively with organizational peers can promote a feeling that “everyone is in the same boat” when facing conflict-laden work expectations (Nahapiet & Ghoshal, 1998). Accordingly, when tenacious employees invest significant personal energy in knowledge exchanges with colleagues, the resulting solidarity may have particularly great value in stressful work conditions in which no one can meet their work demands. Overall, the greater the within-role challenges encountered by employees, the stronger the positive impact of their tenacity on their knowledge exchange propensities should be.

Hypothesis 2: The positive relationship between tenacity and knowledge exchange is moderated by within-work role conflict, such that this relationship is stronger at higher levels of within-work role conflict.

Moderating role of work–family conflict

The relative value of tenacity in spurring knowledge exchange also should be higher in conditions of high work–family conflict. Employees who experience significant conflict between their work and family obligations likely benefit greatly from the knowledge gains they achieve by allocating personal energy to peer interactions that might diminish the tension they suffer (Byron, 2005; Fiksenbaum, 2014). High levels of tenacity provide employees who experience work–family conflict with sufficient energy to seek out and acquire relevant peer knowledge, such that they can do their work more efficiently and reconcile the opposing demands of work and family more easily (Martins et al., 2002). These arguments are consistent with the premises of COR theory. To the extent that employees experience significant stress because of the incompatible demands of their work and family obligations, they should be particularly motivated to invest personal energy into knowledge-based resource gains that help them find novel solutions to the conflict and perform their work tasks more efficiently (Hobfoll & Shirom, 2000). Conversely, if employees do not experience high work–family conflict, their tenacity should have less motivational value for spurring extensive knowledge exchanges with peers.

Exchanging knowledge with colleagues about the negative interference of work with their family obligations also might provide the insight that some work–family conflict is simply inevitable and should be accepted (Fiksenbaum, 2014). Conversely, when work–family conflict is more limited, employees might experience less need to leverage their tenacity in knowledge exchanges with colleagues, because they are less interested in figuring out whether their colleagues face similar problems at home and how they cope. Thus, the tenacity–knowledge

exchange relationship should be weaker to the extent that work-related stress does not easily spill over to employees' personal lives.

Hypothesis 3: The positive relationship between tenacity and knowledge exchange is moderated by work–family conflict, such that this relationship is stronger at higher levels of work–family conflict.

Combined moderating effects of the two role conflict types

We also hypothesize that the positive moderating role of within-work role conflict is particularly strong in conditions of high work–family conflict, such that we predict a three-way interaction among tenacity and the two role conflict types. When employees experience high levels of work–family conflict and their work prevents them from spending the preferred amount of time with their family, they experience an increased need to manage their work responsibilities efficiently (Fiksenbaum, 2014; Wittmer & Martin, 2010). Thus, when work–family conflict is high, employees should be particularly sensitive to the question of whether they can cope with their requirements at work. Their exposure to conflicting demands *across* different work roles then may become particularly stressful, and their ability to channel their tenacity into knowledge-enhancing exchanges that can mitigate the associated stress of underperformance at work becomes extremely valuable (Baum & Locke, 2004).

This reinforcing effect aligns with COR theory. According to this theory, initial resource losses can spark a negative stress spiral, especially if different sources of resource loss operate simultaneously (Hobfoll, 1989; Wright & Hobfoll, 2004). When work and family demands are in competition, employees' diminished sense that they can execute their daily jobs successfully without compromising responsibilities at home (Fiksenbaum, 2014) will be exacerbated if they also encounter conflicting role demands at work. This escalation of negative stress increases the anticipated value of channeling tenacity into extensive knowledge exchanges with organizational

peers, because these knowledge exchanges can provide novel insights into ways to resolve the threat of stress escalation. In contrast, when work and family obligations do not interfere, employees should be less preoccupied with how conflicting demands at work diminish their ability to meet family responsibilities (Jawahar et al., 2012), so the relative value of their tenacity for engaging in extensive knowledge exchanges may be mitigated.

Hypothesis 4: The positive interaction effect between tenacity and within-work role conflict on knowledge exchange is moderated by work–family conflict, such that this interaction effect is stronger at higher levels of work–family conflict.

Research methodology

Sample and data collection

To test the hypotheses, we collected data from employees of a large, Mexican-based pharmaceutical product distributor. Whereas different organizations may face varying external competitive pressures that influence employees' behaviors within the organization (Cui, Griffith & Cavusgil, 2005), we focus on a single organization and thereby avoid the presence of unobserved differences in the external environment. The organization had been in operation for five years at the time of data collection and had undergone spectacular growth due to its distribution agreements with an extensive set of government-owned pharmacies. The nature of the organization's internal functioning—marked by a complex system that anchored employees' job activities in different steps of the value chain, from inbound logistics to product delivery—as well as the significant external competition that the organization faced in terms of maintaining its distribution agreements with local pharmacies, imposed great stress in employees who sought to meet complex job requirements. Therefore, this empirical context is relevant for assessing the question of how the usefulness of allocating personal energy to extensive knowledge exchange might depend on stressful work conditions that entail role conflict.

The data collection involved three steps. First, the organization's employees were all Mexican, and their mastery of English was relatively limited. Accordingly, we developed a survey instrument in Spanish using the translation procedure suggested by Brislin, Lonner, and Thorndike (1973). A bilingual management professor first translated the original English version of the survey into Spanish; another bilingual professor then translated it back into English. The accuracy of the translation was assessed by comparing the two English versions, and any discrepancies were resolved. Second, we pretested a pilot version of the Spanish survey with five employees who were not part of the actual data collection. This pilot test helped us enhance the readability of the questions. Third, we administered the survey instrument with 1,100 employees through the organization's internal mail system. The mail package included a return envelope that was addressed to one member of the research team. This envelope could be deposited in designated mailboxes. Thus, participants were guaranteed that their individual answers would be read only by the research team and that only aggregate results would be communicated to the organization after the study was complete. To decrease the possibility of social desirability or acquiescence biases, we promised participants complete confidentiality in the cover letter, asked them to answer the questions as honestly as possible, and assured them in the different parts of the survey that there were no correct or false answers (Spector, 2006).

We received 746 responses, for a response rate of 68%. This high response rate reflects the strong support for this study by the organization's top management. The respondents, on average, were 34 years of age (ranging from 19 to 75 years), and had been with the firm for 3.4 years (ranging from 1 to 5 years). Furthermore, 22% of the respondents were women; all were Mexican; 75% worked in the company's headquarters, and 25% worked in regional offices in

Mexico; and 46% had operational responsibilities (inventory management or distribution), and 54% took supportive responsibilities (administration or information systems).

Measures

The measures of the four focal constructs came from previous research and used seven-point Likert scales, ranging from 1 (“strongly disagree”) to 7 (“strongly agree”).

Knowledge exchange. We measured employees’ knowledge exchange with four items that reflected the presence of bidirectional flows between employees and their colleagues (Gong, Cheung, Wang, & Huang, 2012; Subramaniam & Youndt, 2005). Sample items are “I interact and exchange ideas with colleagues from different units of the company” and “My colleagues and I share information and learn from one another” (Cronbach’s alpha = .88).

Tenacity. Drawing from Baum and Locke (2004), we used five items to assess employees’ tenacity. Two example items are “I can think of many times when I persisted with work when others quit” and “I continue to work hard on tasks even when others oppose me” (Cronbach’s alpha = .76).

Within-work role conflict. We captured employees’ perceptions of within-work role conflict with five items used in previous research (Fried & Tiegs, 1995; Rizzo, House, & Lirtzman, 1970), such as “I often receive incompatible requests from two or more people” and “I often do things that are apt to be accepted by one person and not accepted by others” (Cronbach’s alpha = .85).

Work–family role conflict. The measure of work–family role conflict used three items from prior research (Martins et al., 2002). Two sample items are “My job prevents me from spending the time with my family or friends that I would like” and “I have to give up attending

important events at home when they conflict with important job-related functions” (Cronbach’s alpha = .77).

Control variables. To account for alternative explanations of employees’ propensity to engage in knowledge exchange, we controlled for three demographic characteristics: gender, age, and organizational tenure (Gong et al., 2012).

In addition, we assessed the validity of the four focal constructs by estimating a four-factor measurement model with confirmatory factor analysis (Anderson & Gerbing, 1988). The fit of the measurement model was excellent: $\chi^2_{(105)} = 333.25$, normed fit index (NFI) = .94, Tucker-Lewis index (TLI) = .94, confirmatory fit index (CFI) = .96, and root mean squared error of approximation (RMSEA) = .05. The convergent validity of the four constructs was evident in the significant factor loadings of their respective items in this measurement model ($t > 2.0$; Gerbing & Anderson, 1988). Moreover, we found support for the presence of discriminant validity among the four constructs. For each of the six pairs that can be generated from the constructs, we checked for any significant differences in the chi-square values of the constrained model (correlation between the two constructs set to equal 1) versus the unconstrained model (correlation between the constructs set free). The chi-square differences were significant for each pair ($\Delta\chi^2_{(1)} > .3.84$). This outcome suggested discriminant validity (Anderson & Gerbing, 1988).

We next conducted two tests to assess the possibility of common method bias. First, we applied Harman’s single-factor test (Podsakoff & Organ, 1986) with an exploratory factor analysis applied to all items of the four focal constructs. If common method bias were an issue, a single factor would account for the majority of the variance in the data. The first factor explained only 28% of the variance, so such a bias is not a significant concern for this study. Second, we ran a confirmatory factor analysis that required each measurement item to load on a single factor;

the fit of that model was very poor ($\chi^2_{(119)} = 3,306.05$, NFI = .41, TLI = .25, CFI = .42, RMSEA = .19), significantly worse ($\Delta\chi^2_{(14)} = 2,972.80$, $p < .001$) than the fit of the aforementioned four-factor measurement model. These analyses—combined with arguments that the threat of common method bias is lower in models that include moderating effects, because respondents cannot identify them easily (Brockner, Siegel, Daly, Tyler, & Martin, 1997; Simons & Peterson, 2000)—alleviate concerns about the presence of common method bias.

Results

Table 1 shows the zero-order correlations and descriptive statistics, and Table 2 shows the regression results. Model 1 included the control variables, Model 2 added tenacity, and Model 3 added the two moderators: within-work role conflict and work–family role conflict. Model 4 expanded to include the tenacity \times within-work role conflict and tenacity \times work–family role conflict interaction terms. Finally, Model 5 featured the three-way interaction term (tenacity \times within-work role conflict \times work–family role conflict), together with the three constitutive two-way interactions, as recommended by Aiken and West (1991). For both the two- and three-way interaction terms, we used the well-established approach to mean center the product terms (Aiken & West, 1991).

[Insert Tables 1 and 2 about here]

The results of the control model (Model 1) indicated that knowledge exchange was higher among female employees ($\beta = .191$, $p < .05$) and older employees ($\beta = .018$, $p < .001$), as well as among employees who had worked for a longer time in the organization ($\beta = .073$, $p < .01$). In support of our baseline prediction that tenacity, as a personal resource, enhances the likelihood of knowledge exchange, Model 2 revealed that tenacity related positively to knowledge exchange ($\beta = .384$, $p < .001$), in strong support of Hypothesis 1. Although not part

of our theoretical focus, the results in Model 3 also indicated direct negative effects of within-work role conflict ($\beta = -.058, p < .05$) and work–family role conflict ($\beta = -.150, p < .001$) on knowledge exchange. The stress due to conflicting role demands diminishes employees’ ability to engage in extensive knowledge exchange with colleagues.

Model 4 supported the hypothesized invigoration effects of within-work role conflict ($\beta = .066, p < .01$) and work–family role conflict ($\beta = .066, p < .01$) on the positive tenacity–knowledge exchange relationship. The anticipation that increasing levels of tenacity can generate useful knowledge gains, through extensive knowledge exchange, was higher when employees feared resource losses because of severe conflict among their work roles (Hypothesis 2) or between their work and family roles (Hypothesis 3). To clarify the nature of these interactions, we plotted the effects of tenacity on knowledge exchange for high and low levels of the two role conflict types in Figure 2, Panels A and B. The plots indicated that the positive relationship between tenacity and knowledge exchange was stronger at higher levels of within-work role conflict and work–family role conflict.

[Insert Figures 2A–B about here]

We also found support for Hypothesis 4 in the positive three-way interaction among tenacity, within-work role conflict, and work–family role conflict (Model 4, $\beta = .040, p < .01$). The positive moderating effect of within-work role conflict on the tenacity–knowledge exchange relationship was stronger at higher levels of work–family role conflict. To clarify this interaction, we plotted the moderating effect of within-work role conflict on the tenacity–knowledge exchange link at high versus low levels of work–family role conflict in Figure 3, Panels A and B. At high levels (Panel A), the pattern of the interaction plot was similar to that in Figure 2, Panel A: Tenacity increased knowledge exchange to a greater extent when within-work role conflict

was high. However, at low levels of work–family role conflict (Panel B), the two lines were almost parallel, indicating the lack of an interaction effect between tenacity and within-work role conflict in this condition.

[Insert Figures 3A–B about here]

Discussion

Implications for research

This study contributes to extant research by elaborating on how employees' tenacity levels inform their propensity to engage in extensive knowledge exchange, as well as how two critical types of role conflict (within-work and work–family conflict) enable this positive effect. The lack of previous attention to this issue is somewhat surprising, in light of the recognition that knowledge exchange activities require significant personal energy, such as when knowledge appropriation and power loss concerns are prominent (Boh & Wong, 2015; Liu & DeFrank, 2013; Swart et al., 2014). Thus, these activities benefit greatly from the availability of relevant personal resources.

Drawing from COR theory (Hobfoll, 1989, 2001), we have focused on the personal resource of tenacity (Baum & Locke, 2004) and its anticipated usefulness in spurring knowledge gains. This usefulness is particularly strong when employees face the challenge of resource loss due to conflicting demands across work roles or between work and family roles (Jawahar et al., 2012; Ngo et al., 2005). We also have proposed the presence of *interdependent* moderating effects of the two role conflict types: The allocation of personal energy to extensive knowledge exchange that occurs when within-work role conflict is high is even greater when work–family conflict also is high. Our research largely supports these theoretical arguments.

The direct positive relationship between tenacity and knowledge exchange is in line with previous research into the beneficial role of employees' personal resource reservoirs for fueling positive work attitudes and behaviors (Avey, Luthans, & Youssef, 2010; Boon & Kalshoven, 2014; Hobfoll, 2011). Although extensive knowledge exchange can generate positive results, such as increased learning and creativity (Chiang et al., 2015; Gong et al., 2013), its emergence also has challenges, because it is energy consuming, and organizational peers may resist opening their knowledge bases (Cabrera & Cabrera, 2002; Guenter et al., 2014; Kim & Mauborgne, 1998; Liu & DeFrank, 2013). This challenge is mitigated for employees who can draw on their own tenacity. Employees who persevere and do not give up their goals easily are eager to invest in knowledge exchange, because of the knowledge-based resource gains they anticipate from allocating their energy to these activities (Boon & Kalshoven, 2014; Hobfoll, 2001). Tenacity also enhances employees' ability to convince others to share their knowledge, even in the face of resistance (Guenter et al., 2014). The discretionary energy associated with high tenacity levels (Baum & Locke, 2004) makes employees less sensitive to the reluctance that organizational colleagues may exhibit when asked to share their personal expertise.

In addition, the positive effect of tenacity on knowledge exchange is invigorated when employees anticipate that the associated knowledge gains may protect them from the difficulty of maintaining adequate job performance in the presence of conflicting role demands, both in the workplace and between their work and family spheres. This focus on the moderating effect of workplace adversity complements previous research that has investigated the *direct* negative relationship between sources of workplace adversity, such as work–family conflict, and knowledge sharing (Kim et al., 2015). This direct relationship was supported by our finding that employees are less likely to engage in extensive knowledge exchange to the extent that they

experience more role conflict across work roles or between work and family roles (Table 2, Model 3). However, we have taken a unique perspective and hypothesized that *if* employees experience high levels of role conflict, the relative value of their tenacity for spurring knowledge exchange increases.

The positive moderating effects of the role conflict types identified by this study follow the COR argument that the relative value of personal resource endowments for spurring additional resource development increases in the presence of resource losses due to adverse work conditions (Hobfoll & Lilly, 1993; Hobfoll & Shirom, 2000). When employees experience conflicting role demands, it becomes more important to channel their personal energy into enhanced knowledge flows, because the combination of disparate pieces of knowledge can generate novel insights into how they can resolve these conflicting role demands (Liu & Liu, 2013; Ralston et al., 2010).

This study also reveals that the usefulness of tenacity for increased knowledge exchange is particularly salient when the two role conflict types (within-work and work–family conflict) operate in conjunction. When stress is more likely to spill over from work to family, any workplace stress originating from incompatible requests by different organizational stakeholders should be felt more strongly (Wittmer & Martin, 2010). In turn, tenacious employees become more eager to leverage their personal energy into knowledge gains that can resolve their conflicting work demands, because the danger of work–family conflict looms large. High levels of work–family conflict also imply that employees can draw less on their family’s support when dealing with challenging work situations (Frone et al., 1992), so they may feel more isolated when dealing with workplace adversity. In contrast, when the likelihood of stress spillovers from

work to family is low, the need to invest personal energy in finding novel solutions to alleviate stress *within* the workplace is subdued.

Overall, this study's results are significant, in that they establish a more complete understanding of the likelihood that extensive knowledge exchange takes place among employees (Wang & Noe, 2010). They specify the concurrent roles of employees' tenacity levels and two distinct sources of role conflict—across different work domains and between work and family domains—in stimulating knowledge exchange. Notably, they reveal individual *and* combined influences of these sources of workplace adversity on the anticipated usefulness of allocating sustained personal energy to knowledge exchange behaviors.

Implications for practice

Knowledge-exchange behaviors can be very beneficial for individual employees and their organizations. Yet barriers also might keep employees from engaging in such behaviors, including the loss of personal power if others appropriate the shared knowledge and take undue credit for it. Thus, identifying a critical personal characteristic, such as tenacity, that enhances knowledge exchange *despite* these challenges has significant practical relevance. This study shows that stimulating tenacious employees to allocate their personal energy proactively to knowledge exchange activities may enhance organizations' ability to cope successfully with resistance to such activities.

Our study also reveals how adverse workplace conditions, with respect to conflicting role demands, influence employees' likelihood of exchanging their respective knowledge bases with peers. Role conflict, whether manifested in work roles or between work and family, has a *direct* negative impact on the likelihood of extensive knowledge exchange. Organizations that seek to encourage knowledge exchange within their ranks can benefit from strategies that diminish the

likelihood of role conflict. They also should recognize that some employees will be hesitant to admit that they struggle with their role requirements, to avoid looking weak or incompetent (Gong et al., 2013). Organizations might need to take a proactive approach to discover whether employees experience severe conflicts in their work responsibilities or unhappiness at home because of their work obligations.

Perhaps the most important practical implication of this study is the beneficial role of tenacity in scenarios in which significant levels of within-work or work–family role conflict cannot be avoided completely, such as when the organization’s internal operations are very complex or it faces severe external competitive pressures (Eatough et al. 2011; Katz & Kahn, 1978). In particular, this study suggests that high tenacity levels can help develop novel insights, through extensive knowledge exchanges, into how to cope with conflicting role demands. Thus, *when* role conflict features prominently in the organization, organizations can greatly benefit from hiring employees who are perseverant and maintain a long-term approach toward allocating personal energy to challenging knowledge exchange activities, however risky these activities might be.

Moreover, training efforts geared at promoting perseverance should be particularly useful when the organizational context is so complex that incompatible demands across work roles are unavoidable or it is impossible to prevent work obligations from impeding on some family responsibilities. In these circumstances, stimulating employees to apply their personal energy to knowledge exchange activities with colleagues, who may experience similar challenges and have suggestions of how to address them, can be of great value. Ultimately, organizations marked by high levels of role conflict can benefit to the extent that they are able to channel the personal

energy reservoirs of their employees into the development of effective knowledge-sharing routines.

Limitations and future research directions

This study has some shortcomings that suggest future research opportunities. First, some caution is needed in terms of causality; the focal tenacity–knowledge exchange could be susceptible to reverse causality. Employees who share extensive knowledge with organizational peers may feel revitalized by these exchanges and draw additional energy to meet their job requirements (Quinn et al., 2012). Although our hypotheses were grounded in the well-established theoretical framework of COR theory (Hobfoll, 1989, 2011), further research could use longitudinal designs that explicitly investigate the causal processes that link tenacity with the propensity of extensive knowledge exchange, as well as the contingency conditions that influence this process.

Second, our focus on tenacity, which reflects the long-term allocation of goal-directed energy to work tasks (Baum & Locke, 2004), was informed by its usefulness for overcoming the sustained resistance that other organizational members may exhibit when it comes to sharing their personal knowledge (Guenter et al., 2014; Kim & Mauborgne, 1998; Wang & Noe, 2010). Further research also could examine whether tenacity has an influence on knowledge exchange, over and beyond that of other personal resources, such as psychological capital (Luthans, 2002). For example, extensive knowledge exchange could be more likely when employees have confidence that they are attractive knowledge partners for colleagues (self-efficacy), make positive attributions about the success of their knowledge-sharing efforts (optimism), have the willpower to find effective ways to meet personal goals and the “waypower” to find alternative paths for goal accomplishment (hope), or have the ability to rebound from unfavorable events

(resilience) (Luthans, 2002; Luthans, Norman, Avolio, & Avey, 2008). Such research also could consider how enhanced knowledge exchange, fueled by tenacity or psychological capital, may inform subsequent creative outcomes (Huang & Luthans, 2015).

Third, and in a related vein, we focused on explaining employees' engagement in knowledge exchange, rather than their actual job performance. To expand our conceptual framework, further research could examine whether and how employees' knowledge exchange propensities, as informed by their tenacity, influence their subsequent job performance, as well as how the moderators studied herein inform this causal process. Further research also could measure employees' energy levels directly and investigate how their enhanced energy serves as a mechanism to link their tenacity to the propensity of knowledge exchange, as implied by our theoretical framework.

Fourth, with our focus on two specific contingency factors, we ignored alternative factors that might invigorate the positive relationship between tenacity and knowledge exchange. Researchers could consider other role stressors, such as role ambiguity and role overload (Ngo et al., 2005), or investigate the influence of workplace adversity stemming from the decision-making process in the organization, such as perceptions about procedural justice (Lind & Tyler, 1988) or organizational politics (Abbas, Raja, Darr, & Bouckenooghe, 2014). To the extent that employees believe organizational decision making is unfair or guided by hidden personal agendas, the anticipated value of allocating sustained personal energy to knowledge gains that can diminish the negative influences of such dysfunctional decision making may increase.

Fifth, our results are based on an organization in Mexico. Because our theoretical arguments are not country-specific, the *nature* of the hypothesized relationships should not differ in other country settings. However, the *strength* of these relationships could vary due to cultural

factors. For example, in an uncertainty-avoidant country such as Mexico (Hofstede, 2001), employees may be particularly sensitive to the hardships that come with role conflict, so the motivation to channel their personal tenacity resources into knowledge-enhancing activities may be stronger than it would be in more risk-prone countries.

Other cultural values that also might have an impact on the strength of the hypothesized relationships are a country's collectivism and power distance (Hofstede, 2001). For example, in collectivistic countries such as Mexico, in which people greatly value family relationships, the stress that emerges when work obligations interfere with family life may be particularly salient. The moderating effect of work–family conflict on the relationship between tenacity and knowledge exchange may therefore be stronger. High levels of power distance between employees and their supervisors, as occur in Mexico, also may stimulate tenacious employees to allocate their personal energy to knowledge exchange activities with their immediate colleagues (the focus of this study) instead of to upward communication with their supervisors.

Therefore, cross-country studies could provide further insights into the importance of different role conflict conditions in invigorating the application of tenacity to knowledge exchange activities in various cultural contexts. It also would be interesting to investigate organizations that include employees with different nationalities, because the propensity to exchange knowledge might be complicated in the presence of different cultural backgrounds in the same organization. Yet another avenue for future research would be to examine whether and how family ties among employees might influence the relationships we proposed in our conceptual framework

Conclusion

This study has addressed the questions of how and when employees' tenacity is more likely to increase their propensity to engage in knowledge exchange activities with organizational peers. The propensity of employees to invest personal energy into such activities increases to the extent that they are exposed to conflicting demands across work roles, as well as between work and family roles. Role conflict increases the motivation of employees to leverage their tenacity in knowledge-enhancing activities, such that they can successfully execute their job tasks despite the presence of the conflict. We hope this work functions as a catalyst for further studies of how organizations can leverage the personal resources of their employee bases effectively, especially in the presence of adverse work conditions.

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Figure 1: Conceptual model

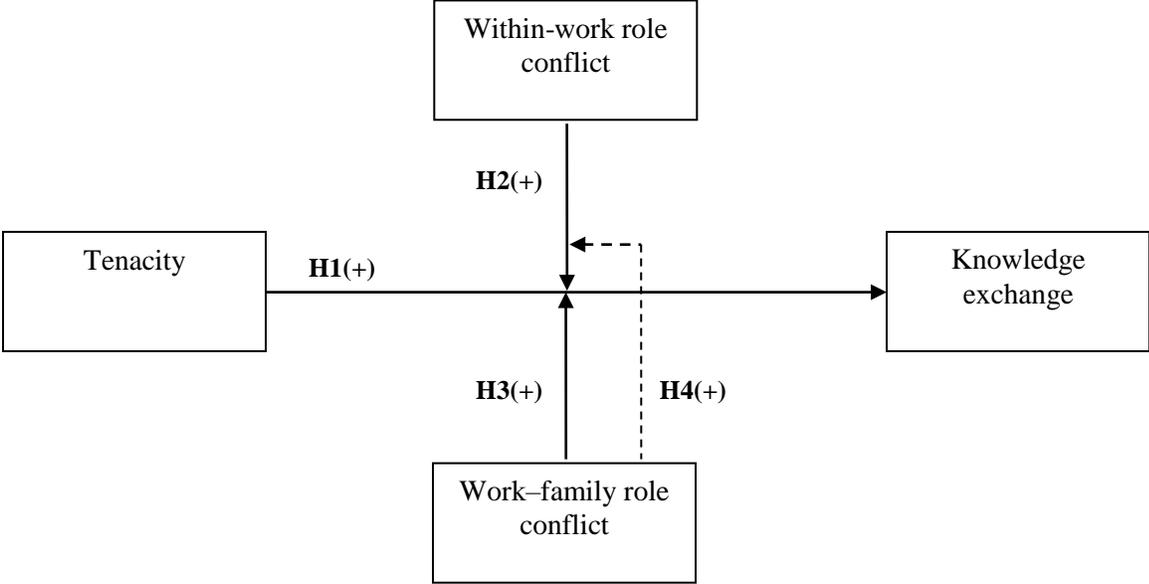
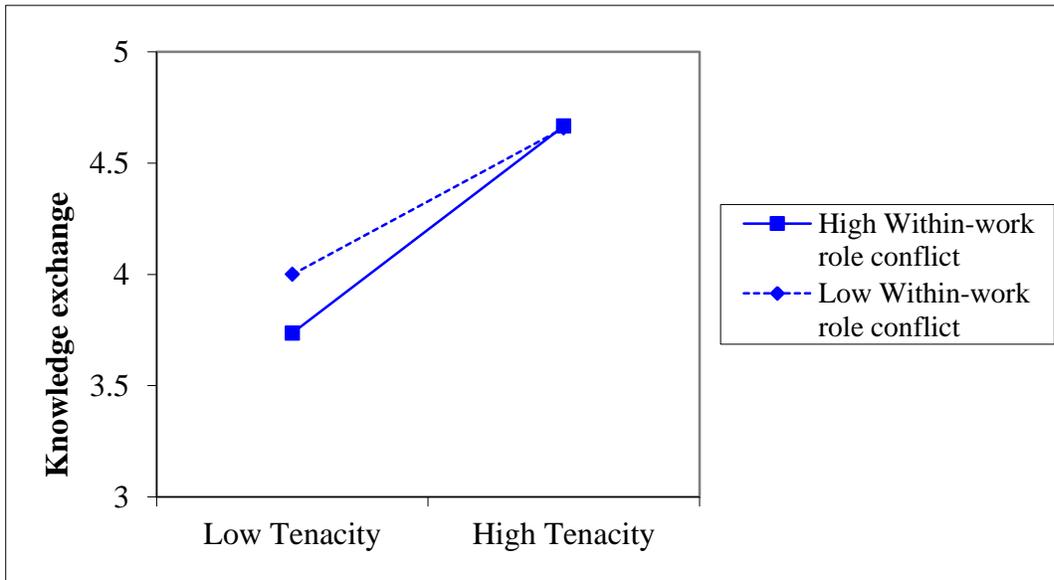


Figure 2: Two-way interaction effects

A. Within-work role conflict on tenacity–knowledge exchange relationship



B. Work–family role conflict on tenacity–knowledge exchange relationship

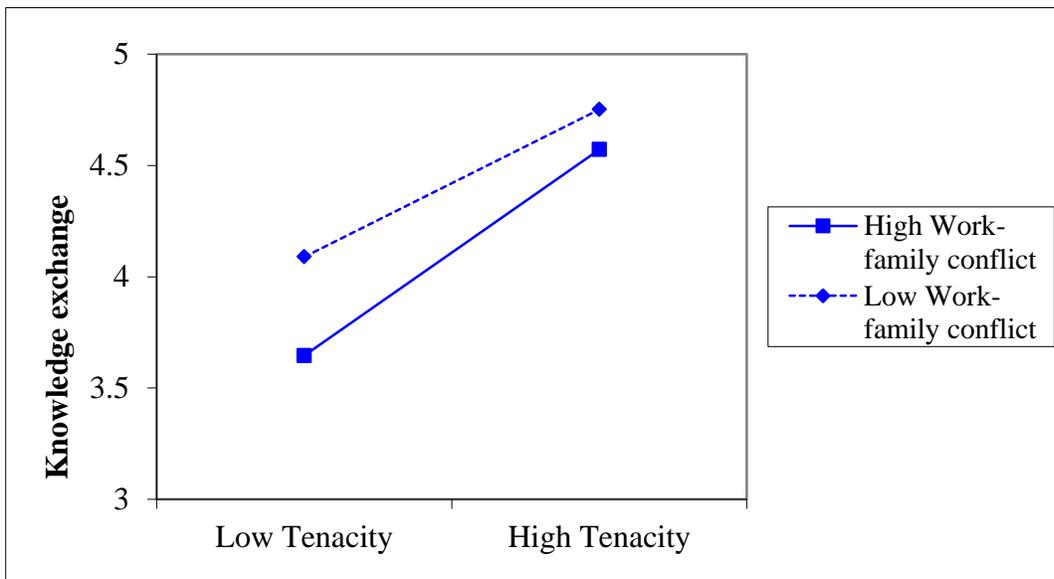
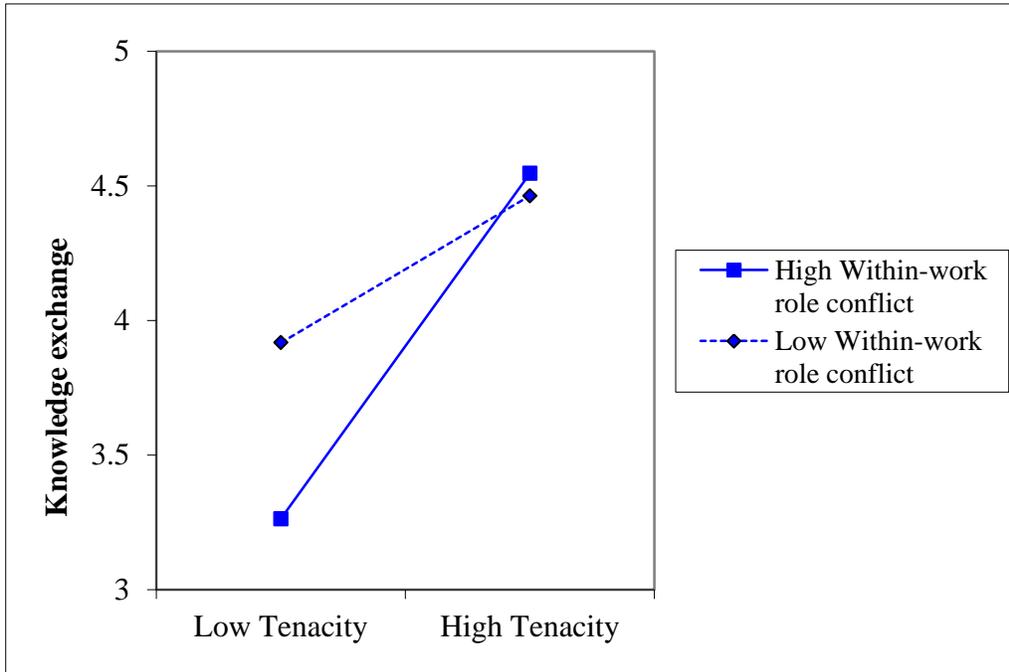


Figure 3: Three-way interaction effect

A: Within-work role conflict on tenacity–knowledge exchange relationship when work–family role conflict is high



B: Within-work role conflict on tenacity–knowledge exchange relationship when work–family role conflict is low

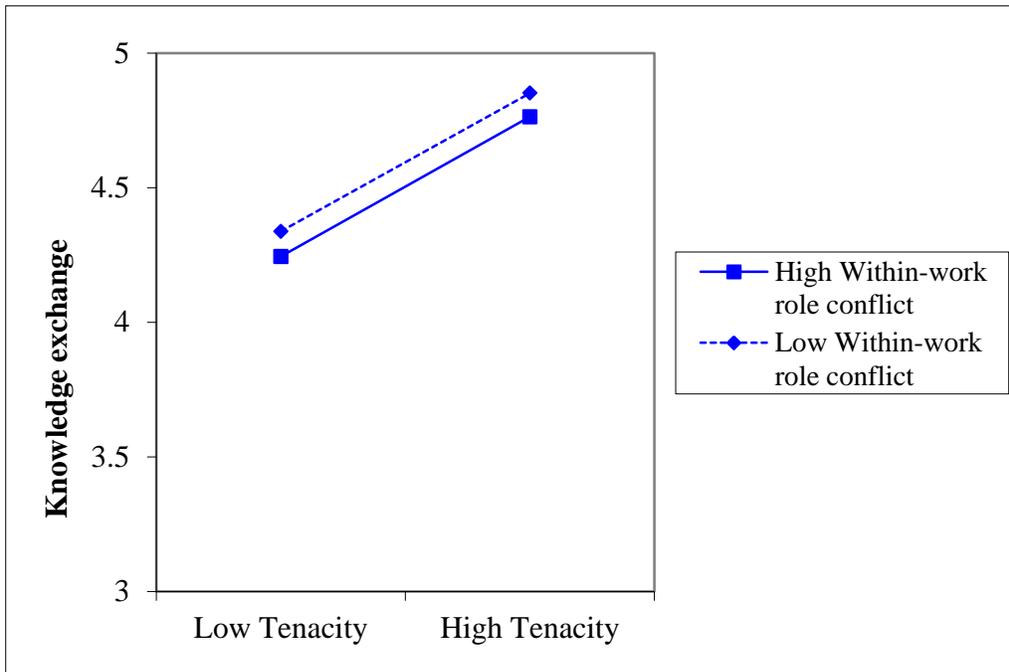


Table 1: Correlation table and descriptive statistics

	Mean	SD	1	2	3	4	5	6	7
1. Knowledge exchange	4.195	1.071							
2. Tenacity	5.339	.988	.370**						
3. Within-work role conflict	2.616	1.404	-.207**	-.063					
4. Work–family role conflict	3.208	1.650	-.267**	-.001	.400**				
5. Gender	.219	.414	.037	-.072*	-.084*	-.102**			
6. Age	33.751	7.930	.147**	.066	-.105**	.028	-.197**		
7. Organizational tenure	3.430	1.682	.137**	.124**	-.015	.025	-.095**	.248**	

Notes: N = 746.

** $p < .01$; * $p < .05$.

Table 2 : Regression results (dependent variable: knowledge exchange)

	Model 1	Model 2	Model 3	Model 4	Model 5
Gender	.191*	.245**	.162 ⁺	.162 ⁺	.156 ⁺
Age	.018***	.017***	.016***	.016***	.015***
Organizational tenure	.073**	.047*	.049*	.051*	.051*
H ₁ : Tenacity		.384***	.376***	.397***	.362***
Within-work role conflict			-.058*	-.064*	-.067*
Work-family role conflict			-.150***	-.156***	-.152***
H ₂ : Tenacity × Within-work role conflict				.068**	.067**
H ₃ : Tenacity × Work–family role conflict				.066**	.061**
Within-work role conflict × Work–family role conflict					-.021
H ₄ : Tenacity × Within-work role conflict × Work–family role conflict					.040**
R ²	.038	.162	.235	.260	.268
R ² change		.124***	.073***	.025***	.008*

Notes: N = 746; unstandardized coefficients (two-tailed *p*-values).

****p* < .001; ***p* < .01; **p* < .05; ⁺ *p* < .10.