Understanding Knowledge Outcome Improvement in Virtual Communities: An Integrative Model from a Relational Development Perspective

Full Paper

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Abstract

This study seeks to understand how relational virtual communities (RVC) members improve knowledge outcomes, including reuse and new use of knowledge. We propose a model by integrating dedication/constraint mechanisms into social cognitive theory. This model delineates the relationship between members' self-belief, motivation, and knowledge outcomes. In particular, self-belief is conceptualized as individual factors and environments factors. Motivation is based on one's evaluation on interpersonal relationship development, in terms of relationship rewards and identity verification. Empirical results from survey data support most proposed hypotheses. We discuss the implications of our results.

Keywords

Social identity, knowledge management, social exchange.

Introduction

Prior work views virtual communities (VCs) as mechanisms to facilitate social activities and goal achievement, including relationship development, access to resources (e.g., knowledge) between members, and pursuit of a variety of goals such as innovation, brand support, product design, and learning new skill (Ma & Agarwal, 2007; Wan et al., 2012). VCs refer to information technology (IT)-enabled virtual space that allows members to collaborate with others, exchange knowledge, and learn from unknown others. Examples include Free/Libre and open source software communities (FLOSS) (Almarzouq et al., 2015). The popular applications from VCs also incorporate myTino.com from the US and Witkey.com from China. The new trend of VCs highlights the use of wisdom from the crowd or group members that help one achieve task goals (Sun et al., 2014). Unlike their focus on economic reward for motivating knowledge sharing, this study seeks to understand knowledge management (KM) initiatives in VCs with voluntary knowledge contributors, referring to relational VCs (RVCs). In RVCs, knowledge is viewed as a public good that allows members to access it without paying. RVCs are growing fast due to the availability of social media for free knowledge access.

Prior work mainly focuses on one specific dimension of knowledge outcomes, such as contribution, use, or exploration, (Chidambaram & Tung, 2005; Ma & Agarwal, 2007; Maruping & Magni, 2012; Tsai and Bagozzi, 2014; Zhou et al., 2012), without providing a comprehensive explanation of the knowledge outcome formation. Knowledge contribution does not ensure outcomes and exploration focuses on innovative use that does not fully exploit the existing knowledge. Only when a RVC can enable members to both exploit and explore knowledge, they are deemed as success. This study thus expands prior work by simultaneously considering the formation of two aspects of knowledge outcomes--exploitation and exploration. The former focuses on applying acquired knowledge to existing processes (*reuse*) for immediate benefits, while exploration highlights long-term benefits from innovation and grasping new opportunities (*new use*) (Durcikova et al., 2011; He & Wong, 2004).

Prior work on IT use emphasizes one's cognition processes to capture belief that affects attitude (e.g., evaluation) and subsequent outcomes. For example, "technology acceptance models" emphasize one's cognition processes (e.g., perceived usefulness) as drivers of evaluation on outcomes and IT use (Davis, 1989). Others drew on social cognitive theory (SCT) to identify individual factors (e.g., competence) and environmental factors (e.g., norms) as antecedents of outcomes through facilitating processes for goal achievement (Wan et al., 2012). These processes reflect one's attitudinal evaluation that directly affects subsequent outcomes. Still, others emphasized the need of interpersonal relationships (e.g., identity development, dedication-constraint analysis) to motivate contribution and outcomes in virtual settings (Ma & Agawal, 2007, Sun et al., 2014). For example, in studies of online service behavior Kim and Son (2009) used the dedication-constraint framework of social exchange theory to analyze the impact of these mechanisms on interpersonal relationship and outcomes. They conceptualized dedication as genuine appreciation for the relationship (e.g., perceived benefits), while constraint as sunk cost to avoid the loss of investment on the relationship (e.g., personalization, service-specific investments).

While useful, the extant research primarily used general IT use theory to explain outcome formation without capturing context-specific features. Besides, most prior studies treat one's cognition as stable without accounting for the dynamic (changed) features based on goal-directed attitude. This creates a gap to understand how one's cognition is transformed into outcome improvement. Brown et al. (2010) call for more focused research to deepen the understanding on IT use and outcomes. This study responds to this call and fills the gap by examining the formation of knowledge outcomes from a relationship development aspect. Thus, we focus on two research questions:

RQ1: How does interpersonal relationship development affect knowledge outcomes?

RQ2: How do members' self-belief systems affect their relationship development?

This study builds on IT use literature and SCT to enrich our understanding on knowledge outcome improvement (Ajzen & Fishbein, 1980; Bandura, 1997; Venkatesh, et al., 2003). The underlying premise of our study is that knowledge outcomes are most likely to be improved by whether a RVC member is perceived to help one build interpersonal relationships. In particular, we conceptualize dedication as perceived relationship rewards and constraint as perceived identity verification. Relationship rewards refer to one's perceived benefits based on the overall evaluation of relationship development. Identity verification is defined as individuals' perceived confirmation from others about their identity (e.g., who they are and what expertise they have). We emphasize the role of relationship development as an intervening variable connecting the causal relationship between self-belief and knowledge outcomes. This study contributes to the KM and social behavior literature by providing a comprehensive explanation based on an integrated model between social exchange and SCT that accounts for how one's self-belief derived from social cognition affects knowledge use phenomena.

Theoretical Background and Hypotheses

SCT emphasizes individuals' self-belief systems that allow them to exercise control over their cognitive processes, motivation, and behavior (Bandura, 1997). SCT has been applied to a range of IT use behavior and has been very predictive of outcomes such as knowledge outcomes (Wei et al., 2011). SCT uses a causal model of triadic reciprocity to explain how individuals' self-belief on managing KM initiatives is developed under the influence of personal factors (e.g., cognition, competence, biological events), environmental factors, and behavior. While these three factors are reciprocally linked, most studies using

SCT adopted an unidirectional approach for model development to both make the model testable and tease out the various effects that occur (Wan et al., 2012).

In this study, we use a unidirectional approach to delineate the relationship between RVC members' self-belief, motivation, and outcome behavior. In particular, we theorize self-belief as individual factors and environmental factors. Besides, building on the dedication/constraint framework, we conceptualize interpersonal relationships as perceived relationship rewards and perceived identity verification, which motivate one's knowledge outcomes. We propose a *belief-motivation-outcome* model as shown in Figure 1.
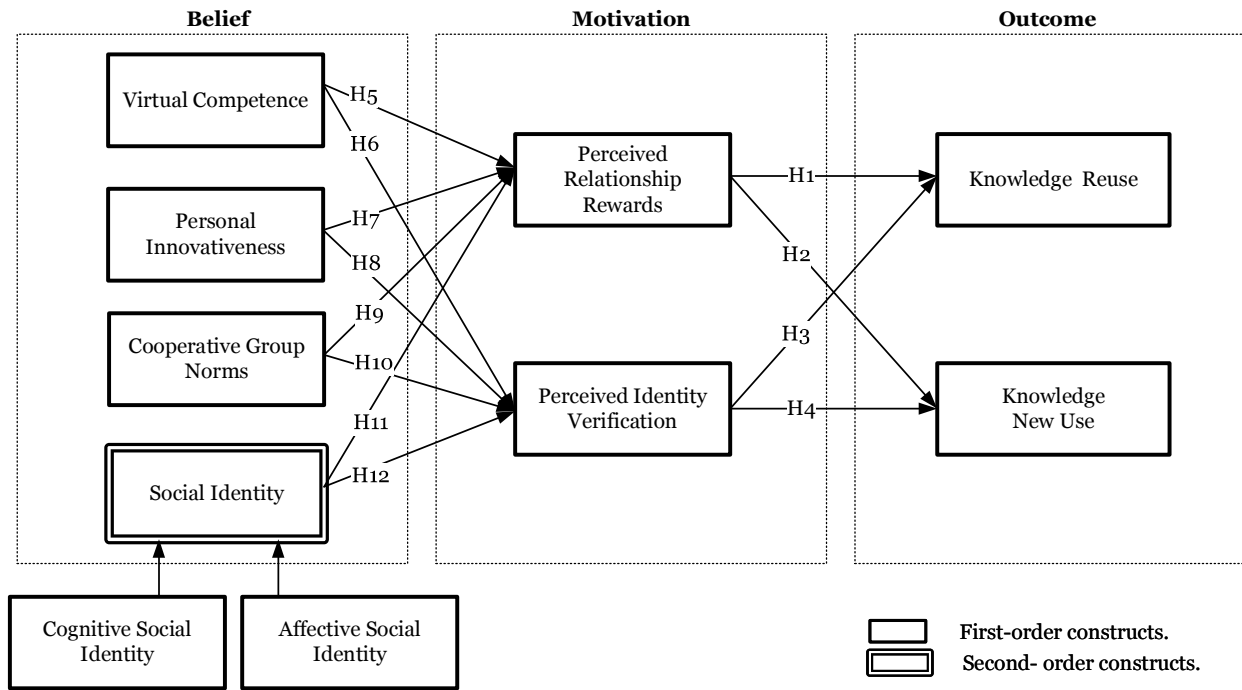

Figure 1. Research Model

Knowledge outcomes primarily depend on two types of knowledge use—reuse and new use (Durcikova et al., 2011). Reuse includes acquisition of knowledge that one can use to solve the existing problem. New use emphasizes the knowledge that can be used to solve new problems. These types of knowledge use represent two different but complementary aspects of KM initiatives that are salient to KM success. Knowledge outcomes have been conceptualized as exploitation and exploration, and have been frequently examined at a firm level (Durcikova et al., 2011). Considering knowledge outcomes in a RVC setting from an individual perspective is largely missing. Thus, we seek to extend prior work by examining the formation of two types of knowledge use.

The Influence of Relationship Development on Knowledge Outcomes

Prior work on VCs has viewed interpersonal relationships as the key motivation for one's outcome improvement (Ma & Agarwal, 2007). This steam of work draws on the dedication/constraint framework of the social exchange theory (Bendapudi & Berry, 1997) to explain how long-term relationships (e.g., interpersonal and customer-firm relationships) (Stanley & Markman, 1992) affect outcomes. For example, in studies of online relationships, Kim and Son (2009) conceptualized dedication as loyalty and constraint as switching cost, which affect outcomes such as usage intention.

We define perceived relationship rewards as individuals' perception on the overall benefits from their history of interaction with a RVC. These rewards based on one's interaction reflects the degree of help gained from the RVC for KM activities such as knowledge exchange for getting new insights and

collaboration for problem solving. Empirical work found that individuals' perceived benefits based on their evaluation on participation in a relationship positively affect outcomes such as attraction toward the relationship and use behavior (Campbell et al., 2013). From a dedication perspective, we expect that members' perceived benefits (current value) from interaction serve as a cue for future value creation (or outcome expectations) from the interpersonal relationship, which motivates them to maintain the long-term relationship with a RVC. This argument has been supported by both IS literature in general and relationship management literature in particular. For example, Compeau and Higgins (1995) drew on SCT and found that outcome expectations significant affect IS use. Others on relationship establishment in an e-service context viewed dedication as individuals' positive evaluation of this relationship with others, in terms of satisfaction and commitment, due to benefits from past interaction (Zhou et al., 2012). They found that this evaluation positively affects use behavior.

We treat perceived relationship rewards as RVC members' positive evaluation on interaction with unknown others. From a dedication perspective, this evaluation positively affects members' use behavior. The main goal of RVC members is to broaden and deepen knowledge through collaboration and knowledge exchange that help them solve existing problem and remove uncertainty such as collaboration with a specific member to use its expertise and avoid information overload. Once members perceive relationship rewards from past interaction, they tend to be more actively involved in RVC knowledge exchange. As such, these members are more likely to exploit others' expertise for solve problems (reuse). Besides, more collaboration also implies that members can explore others' expertise for solution innovation (new use). Therefore, we posit H1 and H2.

H1: Perceived relationship rewards positively affect knowledge reuse.

H2: Perceived relationship rewards positively affect knowledge new use.

This current study defines perceived identity verification as a focal person's identity confirmation by other members. Identity refers to one's self-evaluation on a variety of characteristics, such as expertise and the multi-faced social roles (e.g., family members) (Whitbourne & Connolly, 1999). Individuals hope to have identity verification because they can better interact and share knowledge, and because identity helps them to connect with similar others. This argument is supported by Polzer et al (2002), who drew on mature theory to note that identity verification reflects interpersonal congruence to facilitate relationship development. In studies of VCs Ma and Agarwal (2007) viewed identity verification as a focal person's positive evaluation on interpersonal relationship, which affects knowledge outcomes (contribution) and is influenced by the person's understanding VC features for good self-presentation such as "who did what" and interaction archive and searching tools.

We use a constraint perspective to analyze the impact of identity verification. Confirmation of one's identity is a time consuming task that requires her/his understanding the IT-enabled features of the VC and interaction with others to both better present her/himself and being realized by similar others. Every VC has unique IT features and members different preference regarding characteristics of similar others. Thus, identity is viewed as a non-transferrable investment specific to a VC and perceived identity verification reflects a positive evaluation of the current relationship. Identity verification reflects individuals' investment on the interpersonal relationships. Thus, according to a constraint perspective, the only way to recover the investment is to both maintain the current relationship and actively participate in knowledge exchange and sharing activities with others. Knowledge exchange, collaboration, and interpersonal congruence reflect that the uncertainty in knowledge sharing has been extensively removed, which motivates one to better exploit others' expertise for problem solving (reuse) and gain new insights for exploration (new use).

H3: Perceived identity verification positively affects intention for knowledge reuse.

H4: Perceived identity verification positively affects intention for knowledge new use.

The Influence of Self-belief on Relationship Development

SCT highlights the need of both individual factors and environmental factors that capture one's self-belief to control cognitive processes and use behavior (Bandura, 1997). Individual factors focus on personal characteristics such as traits and ability to manage the social processes (e.g., collaboration, knowledge exchange) that affect outcomes (Wan et al., 2012). Environmental factors highlight the constructed

environments that facilitate KM processes and improve outcomes. Unlike absolute environments that provide the same functions for different individuals, the constructed environment that is experienced and interpreted by each individual is unique and based on the need for outcome improvement (e.g., compatibility) (Chandra et al., 2012).

Individual Factors

 The importance of individual difference in KM initiatives and IT use has been recognized by prior work (Thatcher et al., 2002; Wan et al., 2012). Two major antecedents that are salient to social exchange goals have been identified by literature of social behavior—individuals' learned ability to facilitate social exchange processes and inherent traits for innovativeness to achieve goals (Chandra et al., 2012; Wei et al., 2011). The former emphasizes self-efficacy obtained through learning and absorbing knowledge, while inherent traits focus on enduring and predispose personal characteristics to react to stimuli across situations such as new IT-enabled applications. This study conceptualizes learned ability as virtual competence, and inherent traits as personal innovativeness.

Based on the above literature and SCT, and considering the context of VCs with the relationship development focus, this study views virtual competence and personal innovativeness as the key individual factors that affect interpersonal relationships. Both have been recognized as strong drivers of various processes in KM and goal achievement such as knowledge exchange, and we include them as a means to examine the validity of the proposed social exchange goals, in terms of interpersonal relationships.

We define virtual competence as one's knowledge and ability regarding how her/he effectively uses media features, in terms of better self-presentation and better understanding of others' meaning. This knowledge is acquired from learning, experience on knowledge exchange and media use, and other social interaction activities (Wang & Haggerty, 2011). Unlike computer self-efficacy considering in SCT research that reflects a general self-belief towards IT use, virtual competence is more diverse and highlights self-belief towards goal achievement such as using IT for knowledge exchange. For example, Wang and Haggerty (2011) view virtual competence as a combination of several skill, including general self-efficacy, media skill, and ability to achieve social interaction such as both "know what" and "how to." Examples include skill to interpret text expressions and emotions such as ":", the use of CAPITALIZATION, and exclamation marks (!!!) that represent social cues (e.g., facial activities) in face-to-face interaction. Studies on SCT found that virtual competence plays a key role in facilitating knowledge exchange (e.g., e-learning) and social interaction processes (group learning) (Wan et al., 2012).

We view virtual competence as one's good ability to handle social exchange activities, including interaction and knowledge exchange with others in a RVC. In a RVC with the goal of KM initiatives (e.g., interaction, knowledge sharing) and relationship development, this ability enables one to have confidence on reach this goal. From a dedication perspective, this confidence and good ability tends to help members gain relationship rewards because this ability fosters knowledge exchange and collaboration, which causes them to form positive perception on interpersonal relationships. Thus, we posit that virtual competence, in terms of ability to manage social exchange activities, results in relationship rewards (H5). Because virtual competence facilitates knowledge exchange, in terms of self-presentation of oneself that enables others to better understand one's identity, virtual competence causes one's identity to be easily understood by others, leading to verified identity. From a constraint perspective, establishment of virtual competence requires time and effort, and reflects members' investment on the interpersonal relationship. Thus, we treat this competence as the antecedent of a constraint mechanism, characterized as identity verification. We propose H6.

H5: Virtual competence positively affects perceived relationship rewards.

H6: Virtual competence positively affects perceived identify verification.

We define personal innovativeness as one's willingness and desire to try out new IT and related applications (Agarwal & Prasad, 1998). Personal innovativeness reflects one's self-belief to overcome the difficulty from innovation and take risk from the innovation. Thus, one with personal innovativeness tends to have confidence on participation in innovative processes and goal achievement (Thatcher & Perrewe, 2002). Prior work on individuals' innovativeness with IT noted that this innovativeness captures situation-specific traits, which enables them to broaden stimulating experience and improve confidence on meeting IT-enabled goals (Agarwal et al., 2000).

This study views personal innovativeness as members' confidence on improving KM processes because of their willingness to face uncertainty and risk in knowledge exchange. From a dedication viewpoint, members with personal innovativeness are likely to gain benefits from knowledge exchange and interaction because of success collaboration with others, resulting in relationship rewards. Thus, we propose H7. From a constraint perspective, personal innovativeness also increases one's effort and investment on interpersonal relationships, in terms of participation in knowledge exchange and self-presentation through new use of IT features (e.g., interactive tools, feedback features) that enable others to better understand her/his identity. This in turn increases her/his perceived identity verification. This is because personal innovativeness allows one to both make good use of new IT features and provide new insights and other KM initiatives, from which her/his identity can be successfully verified. Therefore, we posit H8.

H7: Personal innovativeness positively affects perceived relationship rewards.

H8: Personal innovativeness positively affects perceived identify verification.

Environmental Factors

SCT suggests that environments in which individuals operate play a key role in shaping their cognition processes and subsequent behavior (Bandura, 1997). Studies on SCT recognized the constructed environments (Chandra et al., 2012), rather than absolute environments, as the salient self-belief of individuals. Social influence theory focuses on three types of impact—compliance (influence based on other people whose opinion are critical to me), internalization (consistency of shared value in a group norms), and identification (influence based on identity) (Kelman, 1974). Empirical work on VC has used this theory to explain how members' self-belief based on social influence affects evaluation of social exchange activities (Tsai & Bagozzi, 2014). They viewed this influence as environmental factors and conceptualized them as subjective norms, group norms, and social identity. Building on social influence literature (Kelman, 1974), this study focuses on cooperative group norms and social identity, and treats them as constructed environments.

Group norms are defined as socially accepted standards that affect one's self-evaluation on behavior (Birenbaum & Sagarin, 1976). Group norms serve as a guideline for individuals' self-belief regarding how they should behave to meet the social expectation of a specific group. While group norms do not include explicit guidelines, these norms exert a strong influence on one's self-belief and behavior (Feldman, 1984). In studies of e-learning in organizational settings Wan et al (2012) found that cooperative group norms affect one's collaboration and knowledge exchange to attain a learning goal.

We define cooperative group norms as members' perception on group members' shared goal, and willingness for collaboration and knowledge exchange. Cooperative group norms serve as the fundamental guideline for group cognition and behavior regarding when and how to participate in group activities (Dholakia et al., 2004). This positive viewpoint and evaluation on relationship development in turn makes the individuals believe that they can gain rewards from following these norms. Empirical studies of online relationships support this argument by showing that consistency between values held by two parties (e.g., customer-firm) significantly affects relationship rewards (Campbell et al., 2013). Regarding identity, consistency of value systems between group members implies that they have high mutual understanding, mutual agreement, and their communication, interaction, and collaboration become easy. Establishment of the above understanding and collaboration also implies one's investment on interpersonal relationships with group members. Empirical work on VCs reported that IT-enabled environments that facilitate interaction and perspective exchange positively affect perceived identity verification because of mutual understanding (Ma & Agarwal, 2007). Thus, from empirical evidence and the theoretical lens derived from dedication/constraint, we propose the following:

H9: Cooperative group norms positively affect perceived relationship rewards.

H10: Cooperative group norms positively affect perceived identify verification.

In our model, social identity is a manifestation of identification (Ahearne et al., 2005) that captures members' acceptance of identity to guide their cognition processes and behavior when undergoing social exchange processes such as knowledge exchange and collaboration. Social identity highlights individuals' willingness to maintain a positive self-defining relationship with a group (i.e., identity) and use it to

represent themselves (Sluss & Ashforth, 2007). Prior studies suggest that theorizing social identity should consider at least two related but complementary factors—cognitive and affective (Bergami & Bagozzi, 2000). The former emphasizes the acceptance of identity based on a rational aspect (reasoning), while that for affective factor is based on affective self-belief (feeling) such as belongingness and emotional attachment to a focal group. Prior work on VCs conceptualized social identity as multi-dimensions and found that they positively affect group relationship development (Tsai & Bagozzi, 2014).

We follow the above literature by conceptualizing social identity as a second order construct, including cognitive and affective. Cognitive social identity implies that RVC members' reasoning, in terms of cognitive sense and consciousness-based self-belief, causes them to believe themselves as a representative of a social category (Tajfel & Turner, 1986). This reasoning for acceptance of identity allows members to have compatibility (shared values) with those group members who have similarities. Group members with similarities are more likely to reward each other. For example, in empirical work of online relationship development, Campbell et al. (2013) highlighted relationship compatibility (acceptance of value systems) and found that it serves as a key determinant of relationship rewards. Regarding identity verification, compatibility also implies interpersonal congruence ("the level of group members see others in the group as others see themselves") (Polzer et al., 2002), which facilitates knowledge exchange and collaboration to increase identity verification. Applying this to a RVC, we posit that compatibility enables one to have more confidence on self-evaluation of identity verification.

As to the affective social identity, it reflects a feeling perspective of compatibility and acceptance of identity, from which RVC members create identity. Feeling captures one's "identification with, involvement in, and emotional attachment to" the focal group (Allen & Meyer, 1996). Empirical work on VCs found that this feeling of attachment plays a key role in interpersonal relationship (Tsai & Bagozzi, 2014). When RVC members have positive feelings and belongings to a group, they have more confidence to gain rewards from other group members due to acceptance and compatibility between them. Besides, members with identification with and involvement in the focal group are more likely to have good collaboration and knowledge exchange with other group members.

From a dedication/constraint aspect, RVC members' acceptance of identity is likely to bring benefits to them, in terms of relationship rewards. This acceptance is also time-consuming and requires members' investment on the group relationship, in terms of identification development and involvement in KM initiatives such as knowledge exchange. Thus, we view social identity as antecedents of dedication/constraint mechanisms, in terms of relationship rewards and identification verification.

H11: Social identity positively affects perceived relationship rewards.

H12: Social identity positively affects perceived identify verification.

Data Analysis and Results

This study tested the proposed hypotheses by a survey method. We drew on and adapted the variables that have been validated by prior work to increase the validity of our measures. The survey data were collected a large RVC platform in Taiwan with more than 100,000 registered members. The members of this platform include members from China, Hong Kong, and Taiwan. Knowledge exchange between members is visible to every other members in real time. Besides, they are allowed to access this knowledge through a searchable archive.

We used a key informant approach that collected survey responses from a mechanism provided by RVC managers. This mechanism allows a respondent to type in her/his name and then generates a list of 10 possible friends from the database, which was offered by the manager and obtained data from members who had produced response to a member's post. This approach has been used by empirical work to analyze group behavior in VCs (Tsai & Bagozzi, 2014).

The data used for final analysis included 258 respondents (32% response rate) who fell into a total of 48 different RVCs that incorporate RVCs with different subjects such as sports and health care. 146 of the respondents were male (56.6%) and their average age was 28.2. Most respondents had college degree. More than 50% of them had over 5 year experience in VCs. The test of potential non-response bias by t-test provides evidence that this bias was not a problem.

We measured the survey items by using a seven-point Likert scale ranging from 1 to 7 (completely disagree to completely agree). The items measuring knowledge reuse and knowledge new use were adapted from Durcikova et al. (2011). The items regarding interpersonal relationship, in terms of perceived relationship rewards and perceived identity verification, were based on Campbell et al. (2013) and Ma and Agarwal (2007). Measurements of individual factors include virtual competence (Wang & Haggerty, 2011) and personal innovativeness (Thatcher et al., 2002). Finally, environmental factors focused on cooperative group norms (Wan et al., 2012) and social identity (Tsai & Bagozzi, 2014).

Partial least squares (PLSs) were used to evaluate both measurement model and structural model (Chin, 1998). We checked the possibility of common method biases (CMV) because this study collected survey data based on the key informant approach and cross-sectional designs (Podsakoff et al., 2003). Harman's single factor analysis based on principal component factor analysis produced nine conceptually crucial constructs. The results of this analysis show that the first construct captures only 24.8% of the total variance. We thus conclude that CMV should not be a concern.

We assessed measurement model through content validity, and discriminant and convergent validity, including average variance extracted (AVE) (≥ 0.5), Cronbach's alpha (≥ 0.7), and composite reliability (Fornell & Lacker, 1981). The results of these types of validity are all acceptable. Finally, the variance inflation factor (VIF) ranged from 1.21 to 2.73, showing acceptable VIF.

The results of PLS show that eight of the twelve proposed hypotheses are supported. Our findings showed that the influence of perceived relationship rewards on knowledge outcomes was significant, including H1 (reuse; $\beta = 0.56$, $p < 0.001$) and H2 (new use; $\beta = 0.51$, $p < 0.001$). However, perceived identity verification did not exert significant influence on knowledge outcomes, which did not support H3 (reuse) and H4 (new use). The values of R^2s for knowledge reuse and knowledge new use were 34.3% and 32.3% respectively, indicating that knowledge outcomes were well explained by interpersonal relationships. The impacts of individual factors on interpersonal relationships were significant, supporting H5 (virtual competence, perceived relationship rewards), H6 (virtual competence, perceived identity verification), H7 (personal innovativeness, perceived relationship rewards), and H8 (personal innovativeness, perceived identity verification). As to the influence of environmental factors, the results were mixed. H9 (cooperative group norms, perceived relationship rewards) and H12 (social identity, perceived identity verification) were supported, but H10 (cooperative group norms, perceived identity verification) and H11 (social identity, perceived relationship rewards) were not. The R^2 for perceived relationship rewards was 46.2% and that for perceived identity verification was 28.5%, showing that the variance for interpersonal relationships was well explained by RVC members' social cognition, in terms of individual and environmental factors.

Conclusion—Discussion, Implications, and Future Research

Our findings imply that interpersonal relationships play a key role in motivating RVC members' knowledge outcomes. Besides, they view relationship rewards as a more salient driver for knowledge outcomes than identity verification. These results confirm that our theorization of evaluation on interpersonal relationships through the dedication-constraint lens is suitable. Our findings provide a new insight into how knowledge outcomes are motivated by interpersonal relationships, in terms of relationship rewards and identity verification. These factors of interpersonal relationship reflect the evaluation on collaboration and knowledge exchange, from two contrasting forces (i.e., dedication, constraint). Thus, this broadens our understanding on measurement of interpersonal relationships.

Second, the hypotheses regarding the impact of self-belief on interpersonal relationship are largely supported, which implies that integrating SCT into dedication/constraint mechanism is suitable to explain KM phenomena through a belief-motivation-outcome model. Our results imply that individual factors, in terms of virtual competence and personal innovativeness, are critical to RVC members' evaluation on interpersonal relationships based on both dedication and constraint. However, the impacts of environmental factors on interpersonal relationships are mixed. While identity verification is only influenced by the identification aspect of social influence, in terms of social identity, internalization (characterized as cooperative group norms) exerts significant influence only on relationship rewards. Distinguishing the different influence of social influence on the dedication/constraint evaluation of interpersonal relationships deepens our understanding on how environmental factors based on social

influence can be used to explain the relationship between social cognition and social exchange in a RVC context.

Finally, as to the implications for theory, this study contributes to relationship development literature by extending the conceptualization of dedication-constraint framework. Besides, we propose a belief-motivation-outcome model that integrates SCT and dedication-constraint serves as a theoretical framework that helps researchers and managers to theorize and manage KM initiatives from a relationship development aspect.

This study has some limitations. First, our findings regarding the formation of knowledge outcomes in eastern society create a valuable opportunity to extend our understanding on the interconnection between self-belief systems, interpersonal relationship development, and knowledge outcomes. However, the generalization of our results in western society deserves proper consideration, especially the potential moderators for the unsupported results (e.g., H10, H11). Second, members' decision for participation on social activities such as collaboration involves a variety of variables that are not examined in this study such as characteristics of IT, task, and group members (Brown et al., 2010). Future work can focus on the influence of these characteristics on social interaction and relationship development.

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