

Does High Knowledge Contribution Mean Low Knowledge Withholding? Distinguishing Their Underlying Mechanisms by Integrating the Motivation and Neutralization Perspectives

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Abstract

Prior studies have failed to compare the different mechanisms of knowledge contribution and withholding in a same, simultaneous model. Based on the prevailing pro-sharing norms in online communities, this study incorporates intrinsic motivation and extrinsic motivation from a norm-advocated contributing perspective and neutralization techniques from a norm-deviant withholding perspective to investigate their distinct impacts on knowledge contribution and withholding in online communities. Results of an online survey of 448 respondents demonstrate that the effects of intrinsic motivation, extrinsic motivation, and neutralization techniques on KC and KW are strikingly distinct. In addition, differences between the moderating effect of prosocial motivation on the effect of each of these factors on KC and KW are also examined. This research summarizes with a discussion of the theoretical contribution and the practical implication.

Keywords: knowledge contribution, knowledge withholding, neutralization, prosocial motivation, intrinsic and extrinsic motivation

1. Introduction

Knowledge-related behaviors that users in online communities may take are complex and varied. Except for the widely known knowledge contribution (KC), studies have identified that users are likely to engage in knowledge withholding (KW) that refers to the concealment of useful information or professional knowledge (Gonçalves et al., 2023). These two typical behaviors have very different effects since the contributed knowledge is crucial for the sustainable growth of online communities while KW is regarded a hazard to the development of online communities as it results in inadequate sharing of valuable knowledge

and the formation of information monopoly (Shen et al., 2019).

Previous studies have discovered the difference between mechanisms of KC and KW in online communities. They are viewed as two different continuums rather than two opposite extremes of a single continuum by distinguishing influencing factors of KC and KW as motivational and hygiene factors through the lens of two-factor theory (Tsay et al., 2014). However, several gaps remain in exploring different mechanisms of KC and KW in online communities. First, the above proposition has not been well validated due to the precisely opposite effects of the same factors, i.e., justice, trust, and self-efficacy, on KC and KW in their respective examinations (Kankanhalli et al., 2005; H.-F. Lin, 2007; T. C. Lin & Huang, 2010; Tsay et al., 2014). This may be because these studies are constrained to using the same theoretical perspective to explain the completely different KC and KW behaviors, without emphasizing their respective characteristics.

Second, current research is confined by leaving the coexistence of KC and KW in online communities out of consideration. Since KC and KW are two unrelated behaviors, there should exist four possible situations of user performance depending on the level of willingness of KC and KW, such as users with high willingness to both contribute and withhold. But prior studies that solely tracked any of the two behaviors cannot completely cover these cases and thus cannot comprehensively clarify the difference between underlying mechanisms of KC and KW. Based on these gaps, this paper intends to further specify the differences in mechanisms of the two behaviors based on their distinct characteristics in a same model, and to propose the following research question:

RQ: What differences are there between the underlying mechanisms of KC and KW in online communities?

Given the prevalence of pro-sharing norms that signal expectations of contributing knowledge in this

knowledge-intensive context, we distinguish the two by treating KC as the voluntary behavior that conform to socially instilled values and KW as the behavior that deviate from social norms (Shen et al., 2019). With this view, we integrate motivational factors, intrinsic motivation and extrinsic motivation, which are fundamental determinants of contribution behaviors (Nguyen et al., 2019), and neutralization, which is the principal factor of norm-deviant behaviors (Trinkle et al., 2021), into our research model.

Moreover, this study introduces prosocial motivation as a moderator and further compares how prosocial motivation differed in its moderating effect on each factor. Prosocial motivation is the willingness to prioritize others' well-being over their own self-interest (Grant & Berry, 2011). Recent literature has respectively substantiated the prominent role of prosocial motivation in shaping how intrinsic and extrinsic motivations influence KC (Sun et al., 2021) as well as how neutralization affects KW (Sun et al., 2015), but differences in the moderating role of prosocial motivation on relationships between these antecedents and the two behaviors have not been examined.

2. Theoretical background and hypotheses development

2.1. Knowledge contribution and knowledge withholding in online communities

KC in online communities is an individual's conscious effort to make knowledge available on this platform, enabling others to consume or reuse it (He & Wei, 2009; Watson & Hewett, 2006), while KW refers to users do not put full effort in contributing knowledge that causes knowledge fails to spread within the community, including intentional knowledge hiding and unintentional knowledge hoarding (Gonçalves et al., 2023; T. C. Lin & Huang, 2010; Webster et al., 2008). As depicted in Figure 1, these compatible and distinct behaviors collectively determine users' knowledge input and output in their repositories and then the dynamics of knowledge exchange in online communities.

Specifically, first, the term, public good dilemma, has been employed to illustrate the coexistence of KC and KW in influencing users' decisions about whether contribute knowledge to the public. Whereas withholding effort in contribution results in a deficient equilibrium causing non-optimal outcomes for the entire team, it can temporarily yields individual utility (Cabrera & Cabrera, 2002; Gagné et al., 2019). In this case, users participating in online communities may

both have the intention to contribute because of the expected benefits and choose to withhold out of their concerns (Gagné et al., 2019).

Second, KC and KW are distinct continuums because of the differences between their antecedents. Although KW and a lack of KC are similar in behavioral performance, the failure to KC due to, for example, the inadequate grasp of the required knowledge (Connelly et al., 2012) and difficulties in comprehending or indifference towards others' requests (Serenko & Bontis, 2016) are not covered by KW (Connelly et al., 2012). It is also possible that same factors play quite different roles for KC and KW. Relevant literature has validated the impacts that psychological ownership (Batool et al., 2022), work design (Gagné et al., 2019), and bottom-line mentality (Chen et al., 2022) can have on sharing and consciously hiding knowledge in organizational contexts. However, as previous studies have not shown whether the distinction in the impacts of crucial determinants on KC and KW are noteworthy, the belief that KC and KW are different behaviors with different mechanisms has not been fully confirmed.

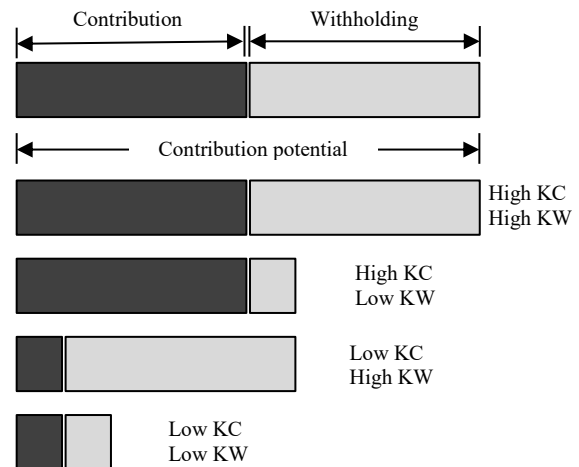


Figure 1. Relationship between knowledge contribution and withholding.

Considering the predominant climate of online communities that advocates sharing knowledge, research treats KC as a prosocial behavior (Sun et al., 2021) and KW as an anti-social behavior based on the type of behavioral orientation (Shen et al., 2019). Given this classification, intrinsic and extrinsic motivation are critical factors in triggering KC since these factors promote adherence to social norms like pro-sharing norms (Zhao & Detlor, 2023), while factors associated with norm avoidance, i.e., neutralization, exert a more prominent impact on KW (Sun et al., 2015). This research integrates intrinsic motivation, extrinsic motivation, and neutralization into the research framework to find the difference

between the role of each factor in influencing KC and KW in online communities.

2.2. Intrinsic and extrinsic motivations

Individuals' motivation can be broadly classified into two types, intrinsic motivation and extrinsic motivation, depending on the goals or reasons that prompt the action (Ryan & Deci, 2000a). Intrinsic motivation is the inherent propensity of people to pursue novelty, enjoyment, and challenge, indicating that internal satisfaction lies in the activity itself in which they participate (Ko et al., 2005; Ryan & Deci, 2000b, 2000a). Extrinsic motivation is the desire for obtaining specific separate benefits or achieving external goals (Ryan & Deci, 2000a). Copious empirical evidence supports the substantial positive impacts of intrinsic and extrinsic motivations on KC in online communities. Intrinsic motivation drives users to contribute knowledge by strengthening the sense of self-efficacy or acquiring the enjoyment in assisting other people (H.-F. Lin, 2007), and extrinsically motivated users will actively engage in KC activities when the perceived benefits from KC such as reciprocity (Nguyen et al., 2019), reputation (Nov et al., 2009), and virtual rewards (Zhao et al., 2016) exceed or equal the associated costs.

There is a dearth of studies focus on the impacts of intrinsic and extrinsic motivations on KW other than a few investigations with inconsistent findings that evaluate the impacts of motivations on KW in organizations by disaggregating motivations based on regulative styles (Gagné et al., 2019; Stenius et al., 2016). This research presumes that KW behavior goes against the principle of intrinsic and extrinsic motivation in two ways. First, it violates the expectations of generalized reciprocity on knowledge exchange, resulting in the experience of damaged interpersonal relationships, image, and reputation in online communities (Webster et al., 2008). Second, it impedes the richness of knowledge available in online communities and provides no help in enhancing users' self-efficacy and task performance (Gagné et al., 2019; Webster et al., 2008). Thus, we posit that intrinsically and extrinsically motivated users will give little thought to KW during their participation in knowledge exchange. Considering the discernible contrasts between the effects of intrinsic and extrinsic motivations on KC and KW, this research proposes that

H1: The positive impact of intrinsic motivation on KC is stronger than its negative effect on KW.

H2: The positive impact of extrinsic motivation on KC is stronger than its negative effect on KW.

2.3. Neutralization theory

In IS research, neutralization theory has been widely used in explaining the rationalization of individuals' norm-deviance behavior. This theory suggests that individuals free themselves to engage in behaviors that contravene social norms and evade feelings of guilt by employing neutralization techniques to render norms inoperative (Siponen & Vance, 2010; Trinkle et al., 2021). Consistent with the approach of Siponen & Vance (2010), this research operationalizes neutralization as a multidimensional second-order construct encompassing all the five techniques from the original work (Sykes & Matza, 1957), the metaphor of the ledger technique (Klockars, 1974) and the defense of necessity technique (Minor, 1981).

Specifically, the *denial of responsibility* is a technique whereby individuals justify their deviant behaviors by whitewashing themselves as victims of circumstances, thereby dissociating themselves from the responsibility for their actions and depersonalizing it to others (Al-Natour et al., 2020; Gosling et al., 2006). Individuals who use the *denial of injury* will maintain that their actions are innocuous and the victim can tolerate any minor harm inflicted upon them (Siponen & Vance, 2010; Sykes & Matza, 1957). The *denial of victim* justification refers to a weakened awareness of the victim that individuals perceive no one got hurt (Trinkle et al., 2021). Individuals who apply the *condemnation of the condemners* turn the tables on the accusers and argue that these accusers are unqualified to comment on their actions (Sykes & Matza, 1957; Trinkle et al., 2021). The *appeal to higher loyalty* refers to a rationalization of norm-deviant behavior that individuals believe there are more important and pressing norms should have higher priority (Sykes & Matza, 1957). The *defense of necessity* represents the necessity of doing the norm-deviant behavior that individuals assert that no alternative exists but to act in such a manner (Minor, 1981). The *metaphor of the ledger* is employed when people rationalize that they have accumulated enough credit to now cash in on doing some deviant behavior because they have done enough good behavior in the past (Klockars, 1974; Lim, 2002).

Scholars have confirmed the positive relationship between neutralization techniques and KW (Sun et al., 2015). But this approach of alleviating guilt or shame in committing deviant actions by making excuses does not seem to effectively stimulate KC which is a type of behaviors meet popular expectations. A comparison between the role of neutralization on the KC and KW yields the following hypothesis.

H3: The positive impact of neutralization on KW is stronger than its negative effect on KC.

2.4. Prosocial motivation

Prosocial motivation is the desire of protecting and advancing the welfare of others, which is typically elicited by contacting with individuals in need of assistance (Grant, 2008). Specifically, individuals who have low levels of prosocial motivation tend to prioritize their own benefits over the welfare of others. As the level elevates, individuals are increasingly concerned about community interests and devote more resources to benefit others even at the expense of their own personal gains (Grant & Sumanth, 2009).

The degree of prosocial motivation of individuals dictates whether they view their KC in online communities as transactional or prosocial behaviors (Sun et al., 2021). Individuals characterized by low degrees of prosocial motivation incline to coolly utilize knowledge exchange to achieve their transactional goals for profits and prevent sacrificing their own interests (Webster et al., 2008). On the contrary, those with high degrees of this motivation prefer to participate in KC and stop KW for helping members and improving the development of online communities (Bolino & Grant, 2016).

This research postulates that there is a substantial difference between the moderating effect of prosocial motivation on each factor's impact on KC and KW. Specifically, prosocial motivation will intensify the positive correlation between intrinsic motivation and KC because prosocial motivation allows users to realize superior outcomes by simultaneously deriving enjoyment from KC itself and fulfilling the desire to benefit others (Grant, 2008; Sun et al., 2021). In addition, it undermines the positive effects of extrinsic motivation on KC since first, the increasing attention concentrated on other-oriented goals may make the self-interest unimportant in the circumstance (Wasko & Faraj, 2000). Second, users with prosocial motives worry that the existence of external rewards will make their altruistic behaviors appear less pure, thus rejecting these incentives (Zhao et al., 2016).

Different from the significant role of prosocial motivation influencing effects of intrinsic and extrinsic motivation on KC, we presume it insignificantly moderates relationships between motivations and KW. Individuals who are prompted by prosocial motives will not consider doing KW that is irrelevant to their purpose of assisting others, regardless of the benefits and costs that KW incur. In other words, prosocial motivation will not correlate with associations between each motivation and KW in online communities.

H4: Prosocial motivation positively affects the influence of intrinsic motivation on KC while has no effect on the influence of intrinsic motivation on KW.

H5: Prosocial motivation negatively affects the influence of extrinsic motivation on KC while has no effect on the influence of extrinsic motivation on KW.

Moreover, based on the premise that contributing knowledge to others is the primary means of aiding in online communities, we contend that individuals with low levels of prosocial motivation incline to make all sorts of excuses so they don't have to expend time and energy in contribution activities (Sun et al., 2015). In contrast, the burning desire for benefiting other people brought from stronger prosocial motivation will overpower the thought of making excuses for not helping (Sun et al., 2015, 2021). Besides, individuals who use neutralization techniques to alleviate their psychological burden of violating pro-sharing norms within online communities are unlikely to focus on normative behaviors like KC. Therefore, we suppose the relationship between neutralization and KC remains unchanged regardless of the level of prosocial motivation.

H6: Prosocial motivation negatively affects the influence of neutralization on KW while has no effect on the influence of neutralization on KC.

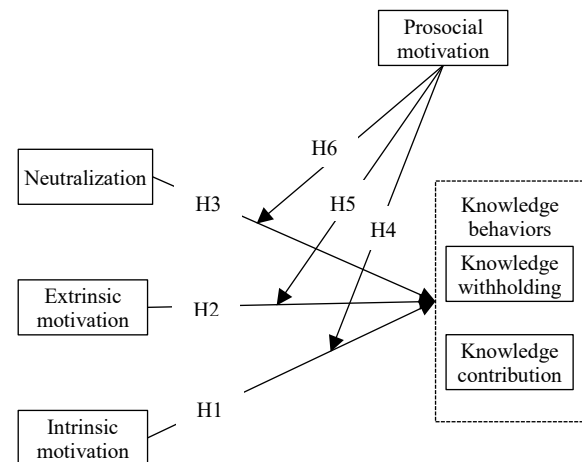


Figure 2. The research model.

3. Methodology

3.1. Research setting and data collection

We conducted an online survey to validate hypotheses by recruiting respondents from the XiaoMi online community. It is widely recognized as a reputable online brand community in China. The global monthly active user count of the online community has surpassed 529 million. Despite the substantial number of active users engaging in

animated discussions on varied topics, statistics show clear signs of withholding knowledge in this platform as evidenced by the low average posts per member at only 6.73. Therefore, the XiaoMi online community is appropriate for our research to explore the underlying mechanisms of KC and KW.

The data was collected via an online survey through a reputable professional survey website in China, namely Sojump (<http://www.sojump.com/>). To recruit respondents, we posted a message with the detail introduction of our research on the homepage of the XiaoMi online community, including the research objective and incentive mechanism. Respondents who complete the questionnaire can participate in a lucky draw with XiaoMi products as rewards such as smart bracelets. The link to jump to our online questionnaire was attached in this post. We also asked for the help of opinion leaders in this community to distribute the questionnaire in online groups in this platform. After the exclusion of invalid responses out of insufficient answer time, apparent response patterns, missing data, and other reasonable criteria, a total of 448 valid questionnaires were collected for data analysis. Table 1 depicts the demographic profiles of the participants.

Table 1. Demographics.

		Frequency	Percentage (%)
Gender	Male	205	45.8
	Female	243	54.2
Age	<18	5	1.1
	18-22	143	31.9
	23-25	90	20.1
	26-30	142	31.7
	>30	68	15.2
Education	High school or below	29	6.5
	College	97	21.7
	University	298	66.5
	Master or above	24	5.4
Occupation	Administrative agency	10	2.2
	Public institution	36	8.0
	Enterprise	197	44.0
	Individual household	25	5.6
	Student	148	33.0
	Others	32	7.1
Community Experience	<3 months	48	10.7
	3-6 months	85	19.0
	6 months-1 year	97	21.7
	1 year-2 years	144	32.1
	>2 years	74	16.5

3.3. Measures

As depicted in Table 2, all measurement items employed in this study are derived from prior studies and have been appropriately modified to align with the

specific context of our investigation. Specifically, intrinsic motivation was assessed with a three-item scale adapted from Spaeth et al. (2015) and extrinsic motivation was measured using three items modified from Bock et al. (2005) and Chiu et al. (2006). We measured prosocial motivation using five items adapted from Grant & Sumanth (2009). KC was measured by adopting three context-specific items from Tong et al. (2013). KW was measured using a five-item scale developed by T. C. Lin & Huang (2010). Consistent with Siponen & Vance (2010), neutralization was conceptualized as a multi-dimensional Type II second-order construct by seeing each dimension as a distinct facet, these subconstructs comprehensively capture the entire domain of neutralization. Each subdimension of neutralization was assessed with scales developed from Siponen & Vance (2010). A seven-point Likert-type scale was adopted to measure all variables.

4. Data analysis

4.1. Measurement model

We adopt the Harman's one-factor test to evaluate the common method variance bias (Podsakoff et al., 2003). Results showed that 7 factors have an Eigenvalue greater than one, and the first factor accounted for 24.86% of the total variance, which is less than 40%. Our test reveals that common method variance is less of a concern in this research.

Partial least squares (PLS) approach was selected to evaluate the measurement model and structural model with the application of SmartPLS 4.0 software. Following the two-step analysis procedure of (Hair et al., 2014), we first test the construct reliability, convergent validity, and discriminant validity to assess the measurement model. Table 2 demonstrates that all factor loadings exceed the threshold of 0.7, ranging from 0.775 to 0.976 (Fornell & Larcker, 1981). The values of composite reliability and average variance extracted (AVE) also meet the recommended criteria of 0.7 and 0.5 (Fornell & Larcker, 1981). Table 3 shows that the value of each square root of the AVE on the diagonal is much greater than the corresponding inter-construct correlations below it. The results of the assessment reflect acceptable reliability, convergent validity, and discriminant validity.

4.2. Structural model

The proposed model explains 44.8% variance (R^2) of KC and 33.3% variance of KW. Figure 2 shows that intrinsic motivation exerts a positive

association with KC ($\beta=.545$, $t=8.133$) while a negative association with KW ($\beta=-.331$, $t=-4.546$). Extrinsic motivation positively affects KC ($\beta=.114$, $t=3.113$) while negative affects KW ($\beta=-.094$,

$t=2.095$). Although neutralization has an insignificant impact on KC ($\beta=-.055$, $t=1.229$), it has a positive impact on KW ($\beta=.418$, $t=8.931$).

Table 2. Item analysis with factor loading, composite reliability, and average variance extracted.

Construct and items		Factor loading	Composite reliability	Average variance extracted
Appeal to higher loyalty (AHL) Siponen & Vance (2010) It is OK to do not contribute knowledge to the online community...			0.838	0.722
AHL1	If you have more important things to do.	0.876		
AHL2	If you need to give up more important things.	0.822		
Condemnation of the condemners (CTC) Siponen & Vance (2010)			0.895	0.810
CTC1	It is OK to do not contribute knowledge to the online community as many other members have not contributed their knowledge either.	0.902		
CTC2	Many others do not contribute knowledge to the online community either, so it is unjust to force you to do so.	0.898		
Denial of injury (DOI) Siponen & Vance (2010) It is OK to do not contribute knowledge to the online community...			0.960	0.922
DOI1	If no one gets hurt.	0.959		
DOI2	If no damage is done to the community.	0.961		
Defense of necessity (DON) Siponen & Vance (2010) It is all right to do not contribute knowledge to the online community...			0.964	0.930
DON1	When you are in a hurry.	0.967		
DON2	When you are under a tight deadline.	0.961		
Denial of responsibility (DOR) Siponen & Vance (2010) It is OK to do not contribute knowledge to the online community...			0.864	0.761
DOR1	If there is not an explicit policy about knowledge sharing.	0.881		
DOR2	If the knowledge sharing policy is not well advertised.	0.864		
Denial of victim (DOV) Siponen & Vance (2010) It is OK to do not contribute knowledge to the online community...			0.918	0.848
DOV1	As everyone should help themselves to find the answer.	0.924		
DOV2	As everyone should not expect for others' help.	0.919		
Extrinsic motivation (EXM) Bock et al. (2005) and Chiu et al. (2006) I contribute to the XiaoMi online community because...			0.874	0.698
EXM1	I can get some rewards.	0.820		
EXM2	I can improve my reputation.	0.901		
EXM3	I can get others' contributions in return.	0.782		
Intrinsic motivation (IXM) Spaeth et al. (2015) I contribute to the XiaoMi online community because...			0.879	0.708
IXM1	I enjoy helping others.	0.838		
IXM2	It is fun to contribute.	0.837		
IXM3	I appreciate it if others value my contributions.	0.850		
Knowledge contribution (KC) Tong et al. (2013) In the XiaoMi online community, ...			0.914	0.779
KC1	I would like to answer the questions posted by other member.	0.875		
KC2	It is likely for me to answer the questions posted by other member.	0.877		
KC3	I am willing to answer the questions posted by other member.	0.896		
Knowledge withholding (KW) T. C. Lin & Huang (2010) In the XiaoMi online community, ...			0.926	0.714
KW1	I contribute less knowledge than I know I can.	0.872		
KW2	I give less effort on knowledge contribution than other members.	0.874		
KW3	I often leave contributing knowledge to other members.	0.775		
KW4	I often take advantage of other members' knowledge without contribution.	0.894		
KW5	I avoid contributing knowledge as much as possible.	0.804		
Prosocial motivation (PSM) A. M. Grant & Sumanth (2009)			0.926	0.715
PSM1	I get energized by working on tasks that have the potential to benefit others.	0.817		
PSM2	I like to work on tasks that have the potential to benefit others.	0.884		
PSM3	I prefer to work on tasks that allow me to have a positive impact on others.	0.884		
PSM4	I do my best when I'm working on a task that contributes to the well-being of others.	0.852		
PSM5	It is important to me to have the opportunity to use my abilities to benefit others.	0.786		
Metaphor of the ledger (MTL) Siponen & Vance (2010)			0.974	0.950
MTL1	I feel my prior contributions to the virtual community compensates for my future unsharing of the knowledge to the community.	0.974		

MTL2	I feel my prior active participation in the virtual community compensates for me future unsharing of the knowledge to the community.	0.976		
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Compared with the significant amplification of prosocial motivation on the positive association between intrinsic motivation and KC ($\beta=.107$, $t=1.817$) and its insignificant role on shaping the negative relationship between intrinsic motivation and KW ($\beta=-.061$, $t=1.339$), our results provide robust evidence for H4. Prosocial motivation dramatically nullifies the positive association between extrinsic motivation and KC ($\beta=-.121$, $t=2.488$) while

insignificantly moderates the negative association between extrinsic motivation and KW ($\beta=-.049$, $t=.927$), providing support for H5. The results in Figure 2 also elucidates that prosocial motivation negatively moderates the positive relationship between neutralization on KW ($\beta=-.138$, $t=3.122$) but not the insignificant relationship between neutralization and KC ($\beta=.033$, $t=.572$), thereby supporting H6.

Table 3. Discriminant validity.

	AHL	CTC	DOI	DON	DOR	DOV	EXM	IXM	KC	KW	PSM	MTL
AHL	0.850											
CTC	0.387	0.900										
DOI	0.366	0.574	0.960									
DON	0.578	0.355	0.228	0.964								
DOR	0.394	0.509	0.648	0.351	0.873							
DOV	0.372	0.555	0.482	0.225	0.499	0.921						
EXM	0.194	0.082	0.097	0.260	0.178	0.101	0.835					
IXM	0.064	-0.116	0.018	0.114	0.083	-0.048	0.299	0.842				
KC	0.029	-0.185	-0.023	0.062	0.020	-0.118	0.247	0.640	0.883			
KW	0.103	0.443	0.267	0.062	0.306	0.404	-0.079	-0.337	-0.420	0.845		
PSM	-0.010	-0.176	-0.058	-0.001	-0.038	-0.092	0.266	0.683	0.516	-0.301	0.846	
MTL	0.180	0.483	0.336	0.134	0.271	0.350	0.018	-0.199	-0.160	0.364	-0.238	0.975

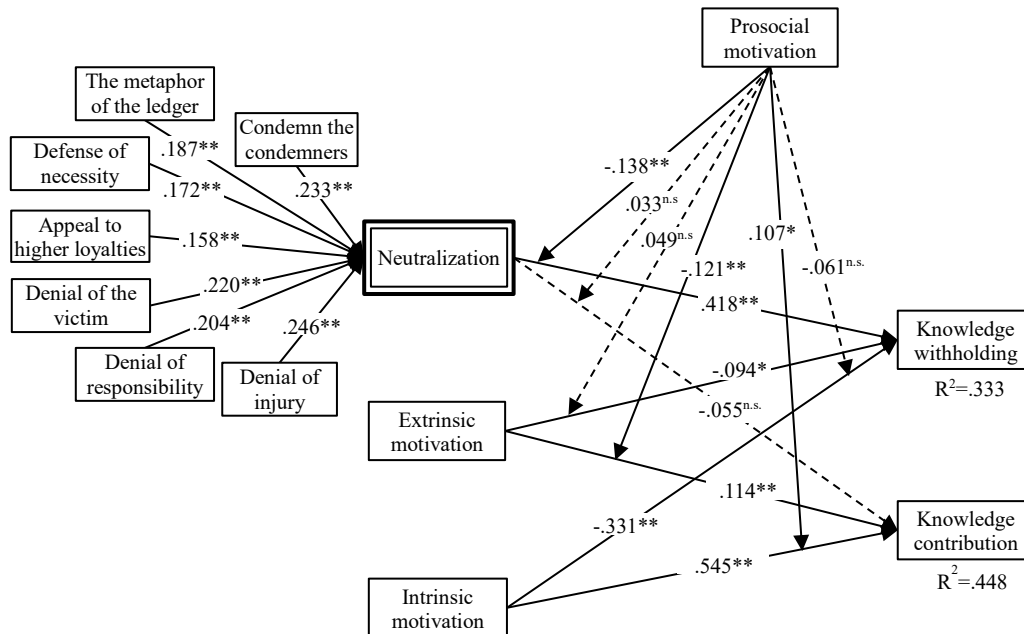


Figure 3. Results of model testing.

Note: ** $p < 0.01$; * $p < 0.05$

Table 4. The smartPLS results.

	KC	KW	KC vs. KW	
	β	β	$\Delta\beta$	t-statistic
IXM	.545**	-.331**	.214	45.733
EXM	.114**	-.094**	.020	7.283
NEU	-.055	.418**	-.363	18.267

We further evaluate the significance of the difference between effects of each factor on KC and KW

in accordance with the method suggested by Keil et al. (2000). As depicted in Table 4, the difference of relationships between intrinsic motivation ($\Delta\beta=.214$, $t=45.733$), extrinsic motivation ($\Delta\beta=.020$, $t=7.283$) on KC and KW are noticeable, supporting H1-2. The distinction between effects of neutralization on KC and KW ($\Delta\beta=-.363$, $t=18.267$) are also obvious, thus partially supporting H3.

5. Conclusions and discussions

5.1. Key findings

This research aims to unearth differences in underlying mechanisms of KC and KW in online communities by distinguishing the characteristics of KC and KW from the perspective of behavioral orientation. Based on predominant norms that encourage sharing knowledge in online communities, the role of intrinsic motivation and extrinsic motivation for norm-advocated behaviors and neutralization techniques for norm-deviant behaviors have been considered. The results illustrate that intrinsic motivation, extrinsic motivation, and neutralization techniques have quite different effects on KC and KW.

Our findings also reveal the distinct role of prosocial motivation in influencing KC and KW in online communities. Prosocial motivation obviously strengthens the positive effect of intrinsic motivation on KC and weakens the positive effect of extrinsic motivation on KC, which is consistent with the conclusion of Sun et al. (2021). It also has a negative moderating impact on the positive relationship between neutralization and KW, in agreement with the findings of Sun et al. (2015).

5.2. Theoretical contributions

This study contributes to the advancement of theoretical development in two aspects within the field of knowledge management by integrating motivation theory, neutralization theory, and prosocial motivation to discover the different impacts of motivations and neutralization techniques on KC and KW in online communities. First, this study shed a more holistic understanding on knowledge exchange in online communities by simultaneously investigating the mechanisms of KC and KW. The change of knowledge in relevant studies has been typically discussed in one direction, i.e., either transfer to others (Hung et al., 2015; Jadin et al., 2013) or acquire but not share (Tsay et al., 2014; Wu, 2020). Although some scholars focused on the knowledge sharing and knowledge hiding in organizational settings (Chen et al., 2022; Gagné et al., 2019), notably, the majority of studies acknowledge knowledge hiding as one form of KW. We agree that knowledge hiding cannot fully cover situations where users reduce their efforts to contribute knowledge. By combining KC with KW to fully capture users' decision-making on managing their own knowledge, this research offers a more comprehensive insight on the theoretical mechanisms of knowledge exchange in online communities.

Second, this research contributes to the literature on KC and KW by distinguishing the different roles of intrinsic motivation, extrinsic motivation, and neutralization techniques in online communities. The prevailing viewpoint in the relevant literature is that factors of KC and KW are extremely different based on social capital theory, social exchange theory, justice theory, and so on (Connelly et al., 2012; T. C. Lin & Huang, 2010; Tsay et al., 2014). However, their approach of exploring around only one of KC and KW and the exact opposite results of the factors on the two do not prove this viewpoint very well. Given the salient pro-sharing norms of online communities, we deepen the related research by examining the different effects of intrinsic motivation, extrinsic motivation, and neutralization techniques on KC and KW in accordance with the motivation theory and neutralization theory. Differences in the role of each factor on different knowledge behaviors are investigated in a same, simultaneous model. Additionally, this research further deepens the comprehension of different mechanisms underlying these influencing factors by discussing the different moderating function of prosocial motivation.

5.3. Practical implications

This study also contributes to several practical implications in two ways. First, we propose that online community operators should acknowledge the ubiquity of neutralization techniques employed by users to minimize their effort in contributing knowledge. Our examination of the strong reversal effect of prosocial motivation on the positive association between neutralization and KW implies a plausible solution to stop withholding efforts of users in exchanging knowledge.

Second, we offer empirical evidence for the importance of promptly adapting reward policies tailored to the nature of online communities. In other words, reward strategies need to be developed contingent on whether the online community is transactional or prosocial. For example, if the online community becomes more prosocial, as indicated by our finding that highlight the prominent impact of prosocial motivation in mitigating the positive relation between extrinsic motivation and KC, managers should implement relevant designs to trigger users' willingness to help others and minimize the presence of external incentives.

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7. References

- Al-Natour, S., Cavusoglu, H., Benbasat, I., & Aleem, U. (2020). An Empirical Investigation of the Antecedents and Consequences of Privacy Uncertainty in the Context of Mobile Apps. *Information Systems Research*, 31(4), Article 4. <https://doi.org/10.1287/isre.2020.0931>
- Batool, U., Raziq, M. M., Obaid, A., & Sumbal, M. S. U. K. (2022). Psychological ownership and knowledge behaviors during a pandemic: Role of approach motivation. *Current Psychology*. <https://doi.org/10.1007/s12144-022-03450-y>
- Bock, G. W., Zumd, R. W., Kim, Y.-G., & Lee, J.-N. (2005). Behavioral Intention Formation in Knowledge Sharing: Examining the Roles of Extrinsic Motivators, Social-Psychological Forces, and Organizational Climate. *MIS Quarterly*, 29(1), 87. <https://doi.org/10.2307/25148669>
- Bolino, M. C., & Grant, A. M. (2016). The Bright Side of Being Prosocial at Work, and the Dark Side, Too: A Review and Agenda for Research on Other-Oriented Motives, Behavior, and Impact in Organizations. *Academy of Management Annals*, 10(1), 599–670. <https://doi.org/10.5465/19416520.2016.1153260>
- Cabrera, A., & Cabrera, E. F. (2002). Knowledge-Sharing Dilemmas. *Organization Studies*, 23(5), 687–710. <https://doi.org/10.1177/0170840602235001>
- Chen, S., Liu, W., Zhu, Y., & Shu, P. (2022). Sharing or hiding? The influence of supervisor bottom-line mentality on employee knowledge behaviors. *Journal of Knowledge Management, ahead-of-print*(ahead-of-print). <https://doi.org/10.1108/JKM-05-2022-0421>
- Chiu, C.-M., Hsu, M.-H., & Wang, E. T. G. (2006). Understanding knowledge sharing in virtual communities: An integration of social capital and social cognitive theories. *Decision Support Systems*, 42(3), 1872–1888. <https://doi.org/10.1016/j.dss.2006.04.001>
- Connelly, C. E., Zweig, D., Webster, J., & Trougakos, J. P. (2012). Knowledge hiding in organizations. *Journal of Organizational Behavior*, 33(1), 64–88. <https://doi.org/10.1002/job.737>
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), 39. <https://doi.org/10.2307/3151312>
- Gagné, M., Tian, A. W., Soo, C., Zhang, B., Ho, K. S. B., & Hosszu, K. (2019). Different motivations for knowledge sharing and hiding: The role of motivating work design. *Journal of Organizational Behavior*, 40(7), 783–799. <https://doi.org/10.1002/job.2364>
- Gonçalves, T., Curado, C., & Oliveira, M. (2023). Clarifying knowledge withholding: A systematic literature review and future research agenda. *Journal of Business Research*, 157, 113600. <https://doi.org/10.1016/j.jbusres.2022.113600>
- Gosling, P., Denizeau, M., & Oberlé, D. (2006). Denial of responsibility: A new mode of dissonance reduction. *Journal of Personality and Social Psychology*, 90(5), 722–733. <https://doi.org/10.1037/0022-3514.90.5.722>
- Grant, A. M. (2008). Does Intrinsic Motivation Fuel the Prosocial Fire? Motivational Synergy in Predicting Persistence, Performance, and Productivity. *The Journal of Applied Psychology*, 93, 48–58. <https://doi.org/10.1037/0021-9010.93.1.48>
- Grant, A. M., & Berry, J. W. (2011). The Necessity of Others is The Mother of Invention: Intrinsic and Prosocial Motivations, Perspective Taking, and Creativity. *Academy of Management Journal*, 54(1), 73–96. <https://doi.org/10.5465/amj.2011.59215085>
- Grant, A. M., & Sumanth, J. J. (2009). Mission possible? The performance of prosocially motivated employees depends on manager trustworthiness. *Journal of Applied Psychology*, 94(4), 927–944. <https://doi.org/10.1037/a0014391>
- Hair, J. F., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, 26(2), 106–121. <https://doi.org/10.1108/EBR-10-2013-0128>
- He, W., & Wei, K.-K. (2009). What drives continued knowledge sharing? An investigation of knowledge-contribution and -seeking beliefs. *Decision Support Systems*, 46(4), 826–838. <https://doi.org/10.1016/j.dss.2008.11.007>
- Hung, S.-Y., Lai, H.-M., & Chou, Y.-C. (2015). Knowledge-sharing intention in professional virtual communities: A comparison between posters and lurkers. *Journal of the Association for Information Science and Technology*, 66(12), 2494–2510. <https://doi.org/10.1002/asi.23339>
- Jadin, T., Gnamb, T., & Batinic, B. (2013). Personality traits and knowledge sharing in online communities. *Computers in Human Behavior*, 29(1), 210–216. <https://doi.org/10.1016/j.chb.2012.08.007>
- Kankanhalli, Tan, & Wei. (2005). Contributing Knowledge to Electronic Knowledge Repositories: An Empirical Investigation. *MIS Quarterly*, 29(1), 113. <https://doi.org/10.2307/25148670>
- Keil, M., Tan, B. C. Y., Wei, K.-K., Saarinen, T., Tuunainen, V., & Wassenaar, A. (2000). A Cross-Cultural Study on Escalation of Commitment Behavior in Software Projects. *MIS Quarterly*, 24(2), 299. <https://doi.org/10.2307/3250940>
- Klockars, C. B. (1974). *The professional fence*. Free Press.
- Ko, Kirsch, & King. (2005). Antecedents of Knowledge Transfer from Consultants to Clients in Enterprise System Implementations. *MIS Quarterly*, 29(1), 59. <https://doi.org/10.2307/25148668>
- Lim, V. K. G. (2002). The IT way of loafing on the job: Cyberloafing, neutralizing and organizational justice. *Journal of Organizational Behavior*, 23(5), 675–694. <https://doi.org/10.1002/job.161>
- Lin, H.-F. (2007). Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science*, 33(2), 135–149. <https://doi.org/10.1177/0165551506068174>
- Lin, T. C., & Huang, C. C. (2010). Withholding effort in knowledge contribution: The role of social exchange and social cognitive on project teams. *Information &*

- Management*, 47(3), 188–196. <https://doi.org/10.1016/j.im.2010.02.001>
- Minor, W. W. (1981). Techniques of Neutralization: A Reconceptualization and Empirical Examination. *Journal of Research in Crime and Delinquency*, 18(2), 295–318. <https://doi.org/10.1177/002242788101800206>
- Nguyen, T.-M., Nham, T. P., Froese, F. J., & Malik, A. (2019). Motivation and knowledge sharing: A meta-analysis of main and moderating effects. *Journal of Knowledge Management*, 23(5), 998–1016. <https://doi.org/10.1108/JKM-01-2019-0029>
- Nov, O., Naaman, M., & Ye, C. (2009). Analysis of participation in an online photo-sharing community: A multidimensional perspective. *Journal of the American Society for Information Science and Technology*, n/a-n/a. <https://doi.org/10.1002/asi.21278>
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions. *Contemporary Educational Psychology*, 25(1), 54–67. <https://doi.org/10.1006/ceps.1999.1020>
- Ryan, R. M., & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Serenko, A., & Bontis, N. (2016). Understanding counterproductive knowledge behavior: Antecedents and consequences of intra-organizational knowledge hiding. *Journal of Knowledge Management*, 20(6), 1199–1224. <https://doi.org/10.1108/JKM-05-2016-0203>
- Shen, X.-L., Li, Y.-J., Sun, Y., Chen, J., & Wang, F. (2019). Knowledge withholding in online knowledge spaces: Social deviance behavior and secondary control perspective. *Journal of the Association for Information Science and Technology*, 70(4), 385–401. <https://doi.org/10.1002/asi.24192>
- Siponen, M., & Vance, A. (2010). Neutralization: New Insights into the Problem of Employee Information Systems Security Policy Violations. *MIS Quarterly*, 34(3), 487–A12. <https://doi.org/10.2307/25750688>
- Spaeth, S., Von Krogh, G., & He, F. (2014). Perceived Firm Attributes and Intrinsic Motivation in Sponsored Open Source Software Projects. *Information Systems Research*, 26(1), 224–237. <https://doi.org/10.1287/isre.2014.0539>
- Stenius, M., Hankonen, N., Ravaja, N., & Haukkala, A. (2016). Why share expertise? A closer look at the quality of motivation to share or withhold knowledge. *Journal of Knowledge Management*, 20(2), 181–198. <https://doi.org/10.1108/JKM-03-2015-0124>
- Sun, Y., Shen, X.-L., & Wang, N. (2015). Knowledge Withholding in Online Brand Community: A Neutralization Perspective. *ICIS 2015 Proceedings*. <https://aisel.aisnet.org/icis2015/proceedings/HumanBehaviorIS/27>
- Sun, Y., Zhang, Y., & Shen, X.-L. (2021). Will extrinsic motivation motivate or demotivate knowledge contributors? A moderated mediation analysis. *Journal of Knowledge Management*, 26(9), 2255–2274. <https://doi.org/10.1108/JKM-01-2021-0048>
- Sykes, G. M., & Matza, D. (1957). Techniques of Neutralization: A Theory of Delinquency. *American Sociological Review*, 22(6), 664–670. <https://doi.org/10.2307/2089195>
- Tong, Y., Wang, X., Tan, C.-H., & Teo, H.-H. (2013). An empirical study of information contribution to online feedback systems: A motivation perspective. *Information & Management*, 50(7), 562–570. <https://doi.org/10.1016/j.im.2013.02.009>
- Trinkle, B. S., Warkentin, M., Malimage, K., & Raddatz, N. (2021). High-Risk Deviant Decisions: Does Neutralization Still Play a Role? *Journal of the Association for Information Systems*, 22(3), 797–826. <https://doi.org/10.17705/1jais.00680>
- Tsay, C. H.-H., Lin, T.-C., Yoon, J., & Huang, C.-C. (2014). Knowledge withholding intentions in teams: The roles of normative conformity, affective bonding, rational choice and social cognition. *Decision Support Systems*, 67, 53–65. <https://doi.org/10.1016/j.dss.2014.08.003>
- Wasko, M. M., & Faraj, S. (2000). "It is what one does": Why people participate and help others in electronic communities of practice. *Journal of Strategic Information Systems*.
- Watson, S., & Hewett, K. (2006). A Multi-Theoretical Model of Knowledge Transfer in Organizations: Determinants of Knowledge Contribution and Knowledge Reuse. *Journal of Management Studies*, 43(2), 141–173. <https://doi.org/10.1111/j.1467-6486.2006.00586.x>
- Webster, J., Brown, G., Zweig, D., Connelly, C. E., Brodt, S., & Sitkin, S. (2008). Beyond knowledge sharing: Withholding knowledge at work. In J. J. Martocchio (Ed.), *Research in Personnel and Human Resources Management* (Vol. 27, pp. 1–37). Emerald Group Publishing Limited. [https://doi.org/10.1016/S0742-7301\(08\)27001-5](https://doi.org/10.1016/S0742-7301(08)27001-5)
- Wu, D. (2020). Withholding effort in sharing knowledge in online space: Differential effects of task characteristics. *Journal of Knowledge Management*, 24(10), 2401–2429. <https://doi.org/10.1108/JKM-04-2020-0310>
- Zhao, L., & Detlor, B. (2023). Towards a contingency model of knowledge sharing: Interaction between social capital and social exchange theories. *Knowledge Management Research & Practice*, 21(1), 197–209. <https://doi.org/10.1080/14778238.2020.1866444>
- Zhao, L., Detlor, B., & Connelly, C. E. (2016). Sharing Knowledge in Social Q&A Sites: The Unintended Consequences of Extrinsic Motivation. *Journal of Management Information Systems*, 33(1), 70–100. <https://doi.org/10.1080/07421222.2016.1172459>