Why share expertise? A closer look at the quality of motivation to share or withhold knowledge

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Abstract

Purpose – *The purpose of this study is to investigate the role of motivation for knowledge sharing (KS) by assessing how four qualitatively different motivation types, as per self-determination theory (SDT), predict KS, its quality and its undesirable counterpart, knowledge withholding.*

Design/methodology/approach – *The study was carried out as a survey (*n *= 200) in an expert organization. The analyses were conducted using structural equation modeling.*

Findings – *Autonomous type of extrinsic motivation (identified motivation) was the strongest predictor of KS (in work meetings) and its quality, whereas the other motivation types (intrinsic, introjected and external) had no independent contribution to variance in KS. Knowledge withholding was negatively associated with identified and positively with external KS motivation.*

Research limitations/implications – *Single organization limits the generalizability of the results. Future studies should further investigate the role of identified motivation for various KS behaviors.*

Practical implications – *The findings suggest that autonomy-supportive management practices known to facilitate self-determined behavior can improve KS. Fostering external motivation by incentivizing KS may be both ineffective and have undesirable consequences.*

Originality/value – *Few prior studies investigate KS motivation beyond external and intrinsic motivation or apply SDT to KS using SDT-based scales. This study distinguishes between four different motivation types and is the first to investigate their differential impact on KS and its quality. It is also the first to demonstrate the importance of identified motivation for KS. It further elucidates how the quality of KS motivation is reflected in knowledge withholding, an overall underinvestigated behavior.*

Keywords *Motivation, Knowledge sharing, Autonomous motivation, Knowledge withholding, SDT*

Paper type *Research paper*

1. Introduction

Knowledge sharing (KS) is a critical behavior in knowledge-based organizations and, therefore, a crucial element of knowledge management (KM). The organization is reliant on effective utilization of its collective knowledge pool, particularly its knowledgeable employees, which is why KS is a highly desirable behavior from an organizational perspective (Cabrera and Cabrera, 2005; Ipe, 2003). KS is, however, potentially dilemmatic for an individual. Sharing with others what makes one valuable for the organization is not in every instance rational behavior (Milne, 2007; Riege, 2005). KS contains a lot of discretion, and the more tacit the knowledge is, the more room there is for an individual to make behavioral choices that are meaningful from his/her personal perspective but not necessarily for the organization (Wang, 2004). This stresses the importance of understanding what motivates an individual to share or, alternatively, to withhold knowledge in knowledge-based work environments.

Motivation is a key determinant of any behavior, traditionally thought to vary primarily in strength, affecting a behavior by strengthening or weakening it (Gagné and Deci, 2005). Motivation does, however, also vary in quality, thereby not only influencing the strength but also the quality of a behavior. The quality aspect of motivation is particularly important for

knowledge-based work, which is cognitively demanding and where productivity is more a function of quality than quantity (Gagné and Deci, 2005; Vansteenkiste *et al.*, 2004).

Many prior studies (Jeon *et al.*, 2011; Kankanhalli *et al.*, 2005; Lin, 2007) take the quality aspect of motivation into account but distinguish mainly between intrinsic and extrinsic KS motivation. The study at hand advocates a more nuanced approach to this classic dichotomy and argues that there is a full range of motivational regulations (i.e. qualities of motivation) (Deci and Ryan, 2000) and that these have a differential impact on KS (Gagné, 2009). This is relevant as it has practical implications for management.

The authors further suggest that KS and knowledge withholding are related but separate behaviors, in accordance with Ford and Staples (2008), and that the motivation to share knowledge is reflected in knowledge withholding. By including knowledge withholding in the present study, it also responds to the call by Witherspoon *et al.* (2013), who in their recent meta-analysis into antecedents of KS stress that knowledge withholding is underinvestigated and needs to be better understood.

Using four different qualities of motivation as predictors, the study at hand aims to investigate:

- how the quality of motivation predicts KS;
- how the quality of motivation predicts the quality of KS; and
- whether the quality of motivation to share knowledge is associated with knowledge withholding.

2. The quality of motivation and knowledge sharing

2.1 The human dimension of knowledge management: Knowledge sharing among employees

Dalkir (2005) defines KM as:

> [. . .] the deliberate and systematic coordination of an organization's people, technology, processes, and organizational structure in order to add value through reuse and innovation. This coordination is achieved through creating, sharing, and applying knowledge as well as through feeding the valuable lessons learned and best practices into corporate memory in order to foster continued organizational learning.

While much work has gone into understanding how to codify and capture knowledge from individual employees to organizational repositories, and investing in sophisticated technology to accommodate this, it has over time become quite clear that a crucial element of successful KM is that employees actually want to contribute to these processes (Cabrera *et al.*, 2006; Wang and Noe, 2010). Some argue that value creation, the goal of KM, only takes place when relevant knowledge is shared (Sveiby, 2001), and while information can be stored in repositories, much of the truly valuable, experience-based tacit knowledge is hard to capture and can, therefore, only be shared in interaction with others (Nonaka and Takeuchi, 1995). It has been proposed that the success of KM initiatives depends on KS (Wang and Noe, 2010). KS can take place in many ways, and it entails a range of behaviors and contexts, both with regard to the type of knowledge and the type of behaviors that ideally result in knowledge transfer. Grant (1996) in his contribution to the knowledge-based theory of the firm, stresses coordination as the key for optimal knowledge integration. He suggests that while efficiency is the goal of many simple processes, achieved through rules and routines and by configuring meaningful work patterns, problem solving and collective decision-making require more meaningful interaction among individuals, taking usually place in meetings. These also carry a higher cost.

The study at hand investigates KS that takes place in work meetings, specifically an individual's willingness to contribute ideas, perspectives and solutions to problems in such

work forums. The point of departure is that these are important work forums, and they make most sense when those participating actually engage in KS. More specifically, the study focuses on the quality of motivation and how it drives individual KS and its quality.

2.2 The quality of knowledge sharing motivation and the research to date

According to Weinstein and Cody (2014), "motivational processes are responsible for initiating and directing human activity; they energize behavior, generate and increase task engagement, and direct actions toward certain ends and goals". Reeve (2005) further proposes that these processes "emanate from forces in the individual and in the environment". Traditionally, motivation is thought as something that varies in strength only. There is, however, increasing evidence that motivation also varies in quality (Gagné and Deci, 2005), commonly classified as intrinsic and extrinsic motivation. According to Amabile (1993), "individuals are intrinsically motivated when they seek enjoyment, interest, satisfaction of curiosity, self-expression, or personal challenge in the work", and they are "extrinsically motivated when they engage in the work in order to obtain some goal that is apart from the work itself" (Oudeyer and Kaplan, 2007).

Much of the research into KS motivation operates along this dichotomy. Typically, the studies distinguish between such extrinsic motivators as rewards, reciprocal and/or reputational benefits, whereas intrinsic motivation is often expressed as enjoyment in sharing or helping or both (Kankanhalli *et al.*, 2005; Lin, 2007; Wu and Zhu, 2012). Intrinsic motivation is sometimes labeled altruism (Chang and Chuang, 2011), and in some studies (Kankanhalli *et al.*, 2005; Lin, 2007), KS self-efficacy is treated as an element of intrinsic motivation. Research findings with regard to the various motivators and their impact on KS are mixed, but there are several studies suggesting that intrinsic might predict KS better than extrinsic motivation (Chennamaneni *et al.*, 2011; Jeon *et al.*, 2011; Kankanhalli *et al.*, 2005). There are also studies that seem to operate under the assumption that material incentives are necessary for KS, suggesting that it is more a matter of how they a structured and not whether they are effective (Bartol and Srivastava, 2002; Milne, 2007; Siemsen *et al.*, 2007). Chang and Chuang (2011) distinguished between quantity and quality of KS and showed that trust and identification were important for the quality and reciprocal expectations for the quantity of KS.

Any general conclusions from studies to date should be drawn with care, as KS in the studies has been defined in various different ways. Sometimes KS is defined very generically (with no explanation of what knowledge or sharing might mean) and sometimes more precisely describing the type of knowledge and how it is being shared. Mostly sharing means contributing knowledge, but in some studies, KS contains both contributing and receiving knowledge (Cabrera *et al.*, 2006; Chen and Hung, 2010). Importantly, many studies into KS motivation investigate technology-mediated KS (Chang and Chuang, 2011; Chiu *et al.*, 2006; Kankanhalli *et al.*, 2005), which should be distinguished from face-to-face interaction (Chennamaneni *et al.*, 2011; Foss *et al.*, 2009; Hung *et al.*, 2011). When accumulating findings on KS motivation, it is important to take into account the differences between the studies.

2.3 Self-determination theory

Self-determination theory (SDT) goes beyond the dichotomous view of the quality of motivation. It is an established theory of human motivation, developed over three decades through extensive empirical testing, by Ryan and Deci (2000b). The underlying assumption in SDT is that individuals are innately active and growth-seeking with a natural tendency to adapt to situational challenges appropriately (Ryan and Deci, 2002). In other words, SDT posits that people are naturally inclined to be constructive and collaborative. These natural tendencies, however, operate in social contexts that can either foster or hinder them. According to SDT, effective human functioning necessitates the satisfaction of fundamental psychological needs of competence, relatedness and autonomy. This means that to

behave optimally, an individual needs to feel effective and able, socially safe and connected to other people, and finally, an individual needs to have some degree of authority and sense of volition in the situation. Social contexts that satisfy these needs also facilitate self-determined behavior. (Gagné and Deci, 2005; Ryan and Deci, 2000a, 2000b).

SDT (Deci and Ryan, 2000; Ryan and Deci, 2000b) further postulates that there are three categories of motivation. Amotivation implies an absence of motivation toward an activity, whereas intrinsic motivation is characterized by an interest or enjoyment in the activity for its own sake. The third category, extrinsic motivation, implies that a behavior is performed for an extrinsic reason other than the activity. "Extrinsic" is, however, not a single quality, but it is divided into four sub-types of differing regulatory styles. (Deci and Ryan, 2000; Gagné and Deci, 2005; Ryan and Deci, 2000a).

Table I presents the three types of motivation and the four sub-types of extrinsic motivation. A behavior is *externally* motivated when it is performed to gain an external reward (such as incentives, promotion, reputational or reciprocal benefits, praise) or to avoid something undesirable such as criticism (Deci and Ryan, 2000; Ryan and Deci, 2000b). Extrinsic motivators in prior KS studies mentioned earlier fall essentially into this category. *Introjected* motivation implies that a behavior is performed for internal rewards or punishments. It is performed because of internal self-worth-related pressures, out of guilt, shame or pride (Deci and Ryan, 2000; Ryan and Deci, 2000b). Autonomous types of extrinsic motivation reflect differing degrees of internalization of the goals of a behavior. Internalization means that an externally prompted behavior becomes an internally endorsed one when an individual understands its importance. A behavior is then performed for reasons extrinsic to the behavior, but these reasons reflect neither material or social benefits nor self-worth-related concerns, but genuinely valued and personally important goals that cast a sense of importance to the behavior. *Identified* motivation reflects a strong identification with the goals and value of the behavior, whereas *integrated* motivation implies that the goals are so deeply internalized that they are even aligned with an individual's personal value system. Autonomous motivation contains all of identified, integrated and intrinsic motivation types, whereas introjected and external are forms of controlled motivation (Deci and Ryan, 2000; Ryan and Deci, 2002, 2000b).

Using the SDT conceptualization of motivation types, most KS studies to date operate with intrinsic and *external* motivation, including those that use SDT as the theoretical framework (Wang and Hou, 2015; Wang *et al.*, 2015; Welschen *et al.*, 2012). Only a few studies use the scales that measure motivational regulation as per SDT. For instance, Foss *et al.* (2009) and Reinholt *et al.* (2011) showed that autonomous motivation as per SDT was highly predictive of KS.

In accordance with SDT, the present study advocates a more nuanced approach to motivational quality for a number of reasons. First, whereas the authors concur with the idea that intrinsic motivation represents the purest type of a motivation, an activity is performed because of the intrinsic pleasure it entails (Deci and Ryan, 2000); it is unreasonable to expect this to take place all the time, or even very often, in the work context. It may be an impossible managerial task to make all work challenging, interesting or inherently

Table I A simplified presentation of the various motivation types and their regulatory styles as per self-determination theory

Motivation:	amotivation	extrinsic				intrinsic
Regulatory styles:	non-regulation	external regulation	introjected regulation	identified regulation	integrated regulation	intrinsic regulation
		controlled motivation		autonomous motivation		

Source: Adapted from Ryan and Deci (2000a, 2000b)

enjoyable. Also, there may be substantial individual variations in terms of what is enjoyable or interesting. Hence, understanding how to effectively influence motivation when work is demanding and effortful rather than intrinsically appealing is important. Second, in complex work, where the cognitive processes are central, the quality of motivation is crucial for the quality of work (Amabile, 1993; Gagné and Deci, 2005). This accentuates the importance of the quality of motivation in knowledge-intensive work environments, where essentially all work is cognitively demanding. Third, any behavior is driven by a number of motives and motivations, often simultaneously (Chemolli and Gagné, 2014; Vansteenkiste *et al.*, 2009), but not necessarily with equal impact. Consequently, it is important to understand the differential impact the quality of motivation may have on the actual behavior of interest.

3. Hypotheses and the research model

In their recent article, Chemolli and Gagné (2014) demonstrate with the help of empirical research that the motivation types as per SDT do not fall on a single continuum. Hence, it makes sense to treat the different qualities as distinct motivational regulations and investigate how they might differently influence behavior (Chemolli and Gagné, 2014; Gagné *et al.*, 2014). Similarly, Burton *et al.* (2006) have stressed that while intrinsic and identified motivation may operate in a complementary fashion, they are nevertheless distinct and influence behavior differently, which they also demonstrate in their study. This study distinguishes between external, introjected, identified and intrinsic motivation. Integrated motivation has been difficult to operationalize distinctively from identified motivation, and it was even omitted from the SDT-based work motivation scale (Gagné *et al.*, 2014).

What quality of motivation best predicts behavior depends also to a degree on the behavior (Losier and Koestner, 1999). It makes sense to identify critical KS behaviors in relevant work contexts and study motivation in these specific situations. This study focuses on KS in work meetings, tacit KS (as a proxy for the quality of KS) and knowledge withholding. In knowledge-based organizations, work meetings are a common work form. Input from various experts is needed to resolve problems, develop new ideas or agree on plans and projects. In line with the study by Grant (1996), it is considered a critical forum for KS and one where experience-based knowledge is shared in face-to-face interaction. The measure used captures KS as a range of clearly defined behaviors (e.g. I expressed ideas and views, I proposed solutions to problems, etc.), which helps overcome some of the ambiguities that generic KS measures entail (Stenius *et al.*, 2015). Tacit KS was examined as a proxy for higher-quality KS behavior. Furthermore, KS is a complex behavior, often associated with some degree of knowledge withholding, as demonstrated in a qualitative study by Ford and Staples (2008). They concluded that KS and knowledge withholding are different but to a varying degree associated behaviors. The study therefore further explored how KS motivation was reflected in knowledge withholding.

As a range of different motives and motivations may drive a behavior (Vansteenkiste *et al.*, 2009), it is reasonable to think that any quality of motivation may predict KS. Participating actively and engaging in KS in work meetings is, however, effortful behavior, which characteristically calls for identified motivation as evidenced in prior studies (Burton *et al.*, 2006; Koestner and Losier, 2002). Hence, the argument is made that KS in work meetings is driven more by a sense of importance (identified motivation) than an expectation of a pleasant experience (intrinsic motivation), self-worth-related concerns (introjected motivation) or social and material benefits (external motivation). Accordingly, the authors hypothesize that:

H1. Identified motivation is the best predictor of knowledge sharing in work meetings.

Autonomous motivation has been associated with better performance (Amabile, 1993) and with better quality behavior (Grant *et al.*, 2011). With regard to KS, it is reasonable to consider tacit KS to be better quality KS. For instance, Haas and Hansen (2007) showed that tacit KS predicted better quality performance. Hence, it is reasonable to think that

autonomous motivation, more than controlled, predicts not only KS *per se* but also its quality (tacit KS). Furthermore, in a busy work environment, taking time to share experiences or ideas is often a step away from the more imminent tasks. Whereas enjoying sharing (intrinsic motivation) probably fuels sharing, it is reasonable to think that this effortful behavior, in line with prior studies (Burton *et al.*, 2006; Koestner and Losier, 2002), is driven even more by a sense of importance (identified motivation).

The authors thus hypothesize that:

H2a. Autonomous types of motivation (intrinsic, identified) are better predictors of tacit knowledge sharing than the controlled types of motivation (introjected, external).

H2b. Identified motivation is the best predictor of tacit knowledge sharing.

External motivation to share knowledge implies a presence of external benefits as a prerequisite for sharing. What logically follows is that in the absence of such external benefits, the person is less likely to share knowledge and is likely to sometimes withhold it. Hence, the authors hypothesize that:

H3. External knowledge sharing motivation is associated with knowledge withholding.

The research model is presented in Figure 1.

4. Method

This survey-based study was conducted in a large public sector expert organization in Finland. Its operations are entirely knowledge based, and consequently, KS is critical for its performance, further challenged by external pressures in the sector to improve efficiency. Hence, it was considered ideal for the study.

4.1 Data collection

The data were collected using an online survey. All employees received an email invitation to participate. Of 685 employees, 200 completed the survey, resulting in a response rate of 29.2 per cent. The survey was conducted in February 2014 (over a period of three weeks), using Webropol Online Survey and Analysis Software. The participant demographic information in Table II shows that almost 90 per cent of the respondents had at least a BSc degree (or equivalent) evidencing of high educational level, not surprising in an expert organization. The average age of participants was relatively high (49.3 years), which was also reflected in career length: More than half had been with the organization for over 10 years.

Figure 1 The research model for all three behaviors

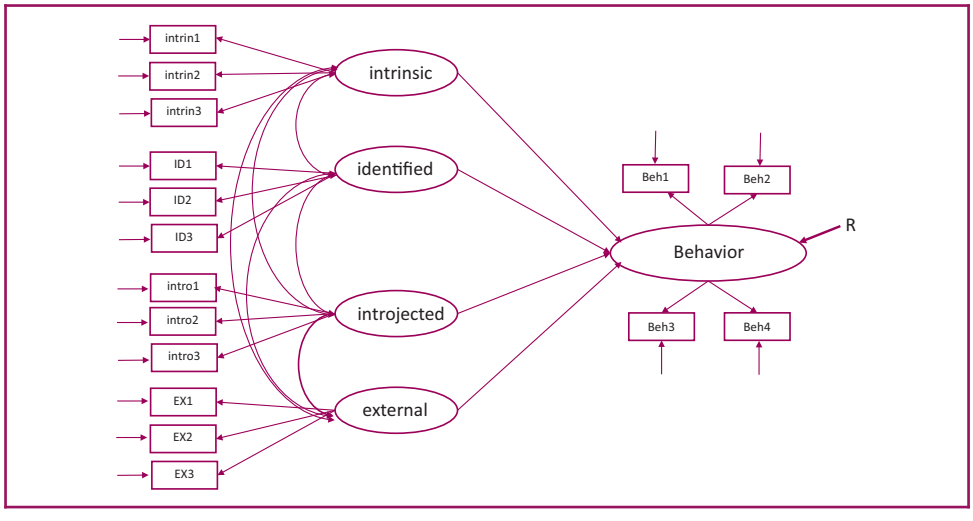


Table II Demographic information (n = 200)

Characteristic	*Category*	*Frequency*	*(%)*
Gender (n = 200)	Male	114	57.0
	Female	86	43.0
Age (n = 198)	30 or less	13	6.6
	31-40	31	15.7
	41-50	54	27.3
	50+	100	50.4
Education (n = 200)	High school or less	21	10.5
	Bachelor's degree or equivalent	63	31.5
	Master's degree or higher	116	58.0
Years in the organization(n = 198)	0-5 years	56	28.3
	5-10 years	33	16.7
	10+ years	109	55.0

4.2 Measures

Three measures of dependent variables were used. For KS in the work context, the measure by Yi (2009) for organizational communications was used. It captures specific KS acts in formal and informal work meetings, which was identified as an important work forum in the organization. It was operationalized by using five items from the study by Yi (2009) scale, for example, "I expressed ideas and views", "I suggested solutions to problems", etc. One item was dropped as its factor loading was below 0.60. The scale of five ranged from "very seldom" to "very often". Composite reliability (CR) at 0.85 indicated of good internal consistency.

For tacit KS, a measure by Bock *et al.* (2005) was used. It contained four items, for example, "I shared my work experiences with my colleagues", "I offer my expertise at the request of my colleagues", etc. One item was subsequently dropped due to its low factor loading (< 0.60). The scale of seven ranged from "completely disagree" to "fully agree". CR of 0.74 suggested satisfactory internal consistency.

There are few validated measures for knowledge withholding. The measures of Peng (2012) for knowledge withholding and Ford and Staples (2008) for partial KS were assessed, and three items to capture knowledge withholding were formed. Considering the sensitivity related to admitting that you might not disclose all you know, the authors had to use judgment on how, in the Nordic culture, these items are best formulated to entice the participants to respond honestly. The items used were "I don't always share all of my know-how with others", "I do not always disclose my ideas to others" and "I do not hoard, but I also do not share all that I know with others". The scale of seven ranged from "completely disagree" to "fully agree". CR of 0.77 evidenced of satisfactory internal consistency.

The SDT scale for KS was designed by using the Exercise Self-Regulation Questionnaire (the format is based on the study by Ryan and Connell, 1989) as the basis because it contains scales for each of intrinsic, identified, introjected and external types of motivation, using three questions for each. The content for each item was further checked against the conceptualizations for each type of motivation from literature (Gagné and Deci, 2005; Ryan and Deci, 2000b). Following a question "Why do you engage in active KS in work meetings?", sample items for each motivation type were "[. . .] because I enjoy it" (intrinsic), "[. . .] because it is an important part of my work" (identified), "[. . .] because I would feel guilty if I didn't" (introjected) and "[. . .] because I want others to think I'm competent" (external). The scale of seven ranged from "completely disagree" to "fully agree". One item from each of identified and introjected motivation types had to be dropped later due to cross-loading. CRs for the sub-scales, ranging between 0.73 and 0.86, were considered satisfactory.

4.3 Statistical analyses

The analyses were conducted using a two-step approach such that the measurement model was first evaluated and, then, the full structural equation modeling (SEM) tested. To investigate the structure of the SDT measure and to ensure that four discriminant factors were extracted, confirmatory factor analyses were done. Convergent and discriminant validity were assessed for all the measures used in the subsequent structural models. *H1-H3* were examined using bivariate correlations and SEM. SPSS22 and MPlus5 software were used for the analyses.

5. Results

5.1 Measurement model evaluation

The SDT scales were assessed first with a confirmatory factor analysis. The modification indices suggested that two items loaded also on other but their intended factors. In this study, it was important that the items load clearly on one factor only, as the aim was to investigate how the different motivation types predict KS. After removing these items, the model exhibited good fit with χ^2 normalized by degrees of freedom (χ^2/df) at 1.86, CFI at 0.97, TLI at 0.95 and RMSEA at 0.066.

Convergent validity of all scales (including the dependent variable) was assessed by the commonly used three criteria and considered satisfactory. All item loadings were significant and deemed sufficient when they exceeded 0.6. One item from the KS construct was dropped to meet the hurdle. Furthermore, the CR exceeded the threshold of 0.7, and average variance extracted (AVE) exceeded the recommended 0.5 (Hair *et al.*, 2010). See Table III for details.

Discriminant validity was also deemed satisfactory. It was assessed by comparing the square root of the AVE for each construct (factor) with the correlations between this construct and other constructs. As Table IV demonstrates, the AVE values on the diagonal exceed the correlations beneath them. As all correlations were < 0.6, the risk for multicollinearity was considered small.

Convergent and discriminant validity were also assessed for the measurement models containing the other dependent variables, tacit KS and knowledge withholding (Appendix 1). Using the above criteria, convergent and discriminant validity were deemed satisfactory for these models also.

5.2 Structural equation model assessment and hypothesis testing

Figure 2 depicts the SEM for KS in work meetings. The model fitted the data well as evidenced by the indicators with χ^2 normalized by degrees of freedom (χ^2/df) at 1.81; CFI

Table III Convergent validity; dependent variable knowledge sharing in work meetings

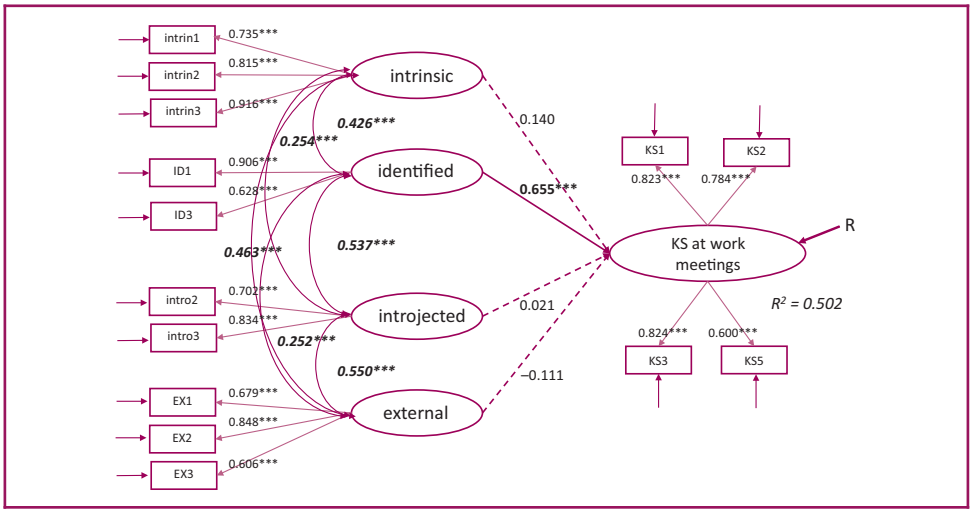
Construct	*Items*	*Factor loading*	*Mean*	*SD*
Intrinsic motivation	intrin1	0.735	4.69	1.38
CR = 0.864; AVE = 0.681	intrin2	0.815	3.86	1.46
	intrin3	0.916	4.05	1.47
Identified motivation	ID1	0.908	5.81	0.93
CR = 0.750; AVE = 0.608	ID3	0.627	5.79	1.00
Introjected motivation	intro2	0.703	3.60	1.48
CR = 0.744; AVE = 0.594	intro3	0.833	4.51	1.46
External motivation	EX1	0.679	3.35	1.46
CR = 0.758; AVE = 0.516	EX2	0.848	3.90	1.42
	EX3	0.606	3.68	1.47
Knowledge sharing	KS1	0.821	3.83	0.78
CR = 0.846; AVE = 0.583	KS2	0.778	3.71	0.85
	KS3	0.825	3.74	0.80
	KS5	0.603	3.68	0.86

Table IV Bivariate correlations and discriminant validity; dependent variable knowledge sharing in work meetings

	Intrinsic	*Identified*	*Introjected*	*External*	*KS behavior*
Intrinsic	*0.826*				
Identified	0.426***	*0.780*			
Introjected	0.254**	0.537***	*0.771*		
External	0.463***	0.252**	0.550***	*0.718*	
KS behavior	0.373***	0.698***	0.348***	0.130	*0.763*

Note: Figures on the diagonal are square roots of average variance extracted for the latent constructs

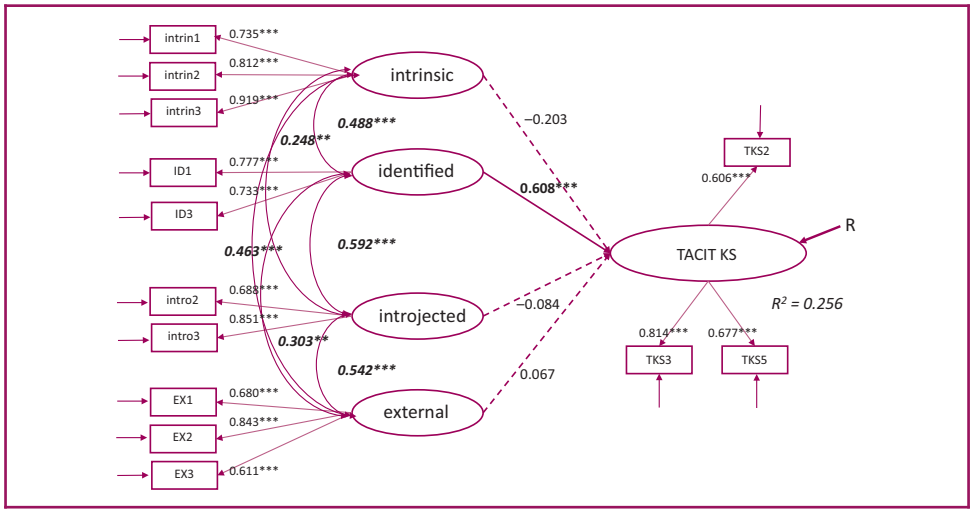
Figure 2 SEM, dependent variable KS in work meetings (n = 200)



at 0.96; TLI at 0.94; and RMSEA at 0.064. The bivariate correlations (Table IV) demonstrate that all other, but external motivation, were positively associated with KS in work meetings, identified motivation more than the others. Steiger's Z-test (Steiger, 1980) affirmed that the correlation coefficients (identified vs other types) were statistically significantly different ($p < 0.001$). The SEM (Figure 2) also suggests that identified motivation was the strongest predictor of KS in work meetings, as it had significant independent variance with KS beyond the shared variance with intrinsic and introjected motivation types. These other two motivation types were rather weakly correlated with one another ($r = 0.25$), suggesting little shared variance among the two, and neither had significant independent variance with KS. Hence, identified motivation was the best predictor of KS in work meetings, and *H1* supported. The coefficient of determination ($R^2 = 0.502$) further shows that approximately 50 per cent of the variance in KS in work meetings was predicted by motivation, most prominently by identified motivation.

Figure 3 presents the SEM for tacit KS. The model fitted the data well as evidenced by the indicators with χ^2 normalized by degrees of freedom (χ^2/df) at 1.64; CFI at 0.96; TLI at 0.95; and RMSEA at 0.057. For bivariate correlations, see Appendix 1. As per Steiger's Z-test (Steiger, 1980), intrinsic motivation did not correlate with tacit KS significantly differently than did either introjected ($p = 0.063$) or external motivation ($p = 0.924$), whereas identified motivation did. It correlated significantly more strongly with tacit KS than did introjected ($p < 0.001$) or external motivation ($p < 0.001$). Consequently, *H2a* is not supported, as it is only true for the part of identified motivation. The correlation matrix (Appendix 1) shows that only identified and introjected motivation types correlated significantly with tacit KS, and the SEM (Figure 3) further demonstrates that identified motivation left no independent

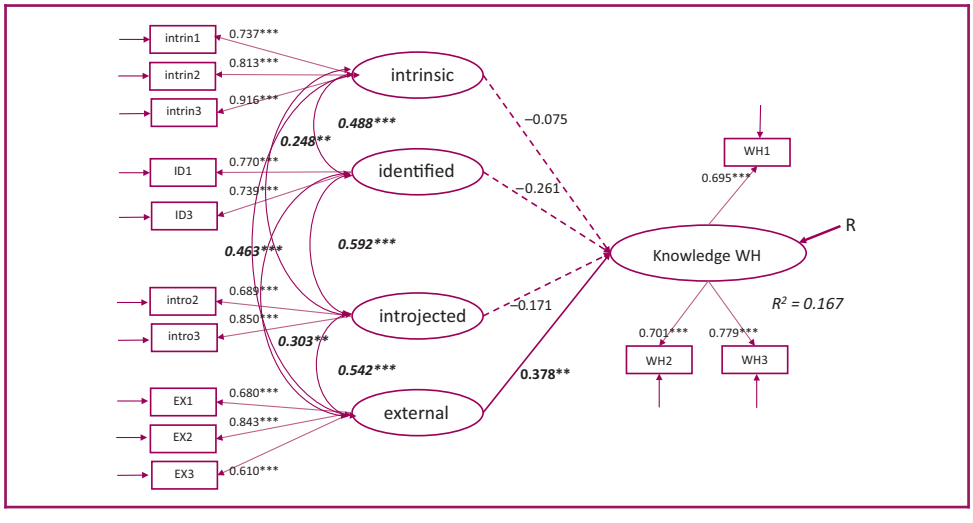
Figure 3 SEM, dependent variable Tacit KS (n = 200)



prediction to introjected motivation, as it alone was statistically significant when all motivation types were in the model. Considering the low correlations of other motivation types with tacit KS, and the SEM, the authors conclude that identified motivation was the best predictor of tacit KS, and hence, *H2b* was supported. Approximately 26 per cent of the variance in tacit KS was predicted by motivation.

Figure 4 depicts the SEM for knowledge withholding. The model fits the data very well as evidenced by the indicators with χ^2 normalized by degrees of freedom (χ^2/df) at 1.48; CFI at 0.97; TLI at 0.96; and RMSEA at 0.049. Correlation matrix (Appendix 1) shows that identified motivation was negatively and external motivation was positively associated with knowledge withholding. The SEM (Figure 4), however, shows that when all types of motivation were in the model, only external KS motivation had significant independent variance with knowledge withholding (R^2 = 0.167). Whereas it can be concluded that external motivation to share was associated with knowledge withholding lending support to *H3*, a further post hoc analysis was conducted to understand the association between identified motivation and knowledge withholding (r = −0.28, p = 0.001). To eliminate any interfering shared variance from intrinsic and introjected motivation, these were excluded

Figure 4 SEM, dependent variable Knowledge Withholding (n = 200)



from the model. The resulting well-fitting SEM (CFI 0.98; TLI 0.97; RMSEA 0.045) showed that both identified ($\beta = -0.37$; $p < 0.001$) and external motivation ($\beta = 0.28$; $p = 0.002$) were significant predictors of knowledge withholding, together accounting for 14.8 per cent of its variance.

6. Discussion

The aim of the study was to shed light on how the quality of motivation predicts KS. More precisely, the authors sought to investigate how different qualities of motivation, beyond the typically used intrinsic and external motivation, might differently drive KS and its quality. The study also investigated how KS motivation may be reflected in its dysfunctional companion, knowledge withholding. The analyses demonstrated that except for external motivation, all qualities of motivation were associated with KS in work meetings. Furthermore, they suggested that identified motivation, the sense of importance, was a clearly better predictor than the other qualities, thereby supporting *H1*. The assumption (*H2a*) that autonomous motivation would better predict the quality of KS (tacit KS) than controlled motivation was not entirely supported. It was only true for identified motivation, which was the best predictor of tacit KS, lending support to *H2b*. It was further established that external KS motivation, sharing to gain something, was associated with knowledge withholding as expected, supporting *H3*. The authors additionally discovered that identified motivation was also associated with knowledge withholding, albeit negatively. To sum up, the analyses suggested that identified motivation, which expresses a sense of personal importance for the goals of an activity, was the best predictor of both KS (at work meetings) and its quality (tacit KS). It was negatively associated with knowledge withholding suggesting that if the sense of importance is missing, then this may result in knowledge withholding.

Importantly, motivation to share knowledge in work meetings explained half of the variance in actual KS in work meetings. It also explained some 25 per cent of the variance in tacit KS, which is substantial with regard to both behaviors. Furthermore, some 15 per cent of the variance in knowledge withholding was explained by motivation to share knowledge (a combination of external KS motivation and lack of identified KS motivation). Not only is this in line with Ford and Staples (2008), who proposed that KS and knowledge withholding are associated behaviors, but also it sheds light on how the two behaviors might be connected.

The finding that identified motivation, the sense of importance, had the strongest impact on actual behavior is in line with Koestner and Losier (2002), who studied political behavior. In their studies, intrinsically motivated kept actively abreast of the media coverage on elections, the fun part, but actual voting, the part requiring an effort, was predicted more by identified motivation. Similarly, Burton *et al.* (2006) showed that students' intrinsic motivation predicted their psychological well-being, whereas identified motivation predicted performance outcomes. Studies using SDT measures in KS research (Foss *et al.*, 2009; Reinholt *et al.*, 2011) lend support for the role of autonomous (intrinsic and identified) motivation for KS, but there are no studies the authors know of that have used all four qualities of motivation as predictors of KS and investigated how they might differently predict behavior.

Identified motivation was also the best predictor of tacit KS, suggesting that identified motivation also drives the quality of KS. Chang and Chuang (2011) also distinguished between quantity and quality of KS in virtual communities. In their study, an item called "participant involvement" was more strongly associated with KS quality than with external or intrinsic motivators. Participant involvement was defined to include interest, importance, a chance to express oneself, etc., and could be viewed as a proxy for autonomous motivation, thereby also supporting the idea that higher-quality motivation predicts higher-quality KS.

Whereas prior studies have focused on the dichotomy between intrinsic and *external* motivation, and focused on the differential impact of a number of external motivators (reputation, reciprocal benefits, rewards), the present study demonstrated that identified motivation can be highly important for KS. Furthermore, external motivation, which reflected both material and social benefits, was neither associated with KS in work meetings nor tacit KS. Introjected motivation, on the other hand, was equally important as intrinsic motivation, implying that self-worth-related considerations may also drive KS in work situations.

The finding that identified motivation was the best predictor of KS might not be generalizable to all KS situations in the work context. In line with, for example, Koestner and Losier (2002) and Gagné *et al.* (2014), the authors, however, suggest that when work is not interesting or enjoyable, instilling a sense of importance becomes very important. Research evidence (Deci *et al.*, 1994; Gagné *et al.*, 2000) suggests that autonomous motivation is best fostered by adopting an autonomy supportive management style that emphasizes communication, choice and empathy. Providing a reasonable rationale and choice and taking employees' perspective into account have been found to be particularly important when work is more demanding than enjoyable, as they facilitate endorsement of appropriate work behaviors (Gagné and Deci, 2005). As a general principle, caring for the basic needs of competence, relatedness and autonomy is essential for self-determined behavior (Ryan and Deci, 2002), thereby presenting further ideas for how to meaningfully develop the work environment.

7. Conclusions

The present study set out to investigate how the quality of motivation might differently predict KS, using four different qualities of motivation as predictors. The findings suggest that identified motivation, the sense of importance, was the most important motivational driver of KS in work meetings. The sense of importance was also the best predictor of the quality of KS, and furthermore, it was negatively associated with the tendency to withhold knowledge. On the contrary, external motivation, an expectation that there must be something to gain from sharing, was not at all associated with KS. It was, however, positively associated with knowledge withholding. These findings were in line with the hypotheses.

The authors have argued that the quality of motivation is particularly important in knowledge-intensive work environments, where work is cognitively demanding, and the quality of performance, rather than quantity, counts. Many studies into KS motivation distinguish only between intrinsic and external motivation, whereas the present study showed that the qualities of motivation that fall between the two, in particular identified motivation, are important to understand in the work context. Theoretically, one could argue that intrinsic, as the purest type of self-determined motivation, should be the best predictor of a behavior. The present study did not support this. Instead, it was the sense of importance that fueled KS in work meetings. Burton *et al.* (2006), whose findings on academic performance were similar, suggested that with effortful behavior the sense of importance, rather than interest, induces persistence and orientation toward the longer-term goals. This is an important point to understand in the work context, where much of what is done, including KS, is effortful and demanding. Rarely is work fun and interesting all the time, but from the perspective of high-quality motivation, it needs not be that either. What it should be is meaningful, and this means that the employees should understand why the work, or certain behaviors such as KS in work meetings, is important. The study further suggested that engagement in KS out of a sense of importance was negatively associated with knowledge withholding. Hence, the authors argue that the sense of personal importance is a critical motivator, not only fueling appropriate behaviors but also enhancing their quality. Furthermore, they seem to keep dysfunctional behaviors at bay. External motivation to share for its part promotes neither KS nor its quality. It was only associated with knowledge withholding.

7.1 Limitations

As most studies into predictors of KS, this study relied on cross-sectional data, which is problematic for causal inferences. Common source may be a further limitation, mitigated however to some extent as two distinct things were measured – reasons for behaving and actual behavior. Single organization limits the generalizability of the results. The response rate at 29.2 per cent is modest but not unusual for these types of studies, and the demographic profile of participants in the study corresponded to that of the organization. Few missing responses suggest good data quality.

A challenge with investigating KS is that sharing alone does not guarantee knowledge transfer to take place. The authors, however, believe that while sharing is not sufficient, it is a necessary condition for knowledge transfer, and it therefore makes sense to first understand what drives KS.

Motivation to share knowledge at work meetings was used as a proxy for a more general KS motivation and used to predict tacit KS. The authors felt that placing the behavior at a common work context is likely to be telltale of the overall KS motivation. Tacit KS is also important in work meetings, and hence, the measure can at least be accepted in this context. KS motivation at work meetings was also used to predict knowledge withholding, which is similar to what Cockrell and Stone (2010) did. They used the motivation to share professional knowledge to predict KS of useless knowledge. Accommodating the SDT scales for knowledge withholding would have been difficult, as they are not well suited for dysfunctional behaviors. Being related behaviors (Ford and Staples, 2008), it is reasonable to assume that the motivation to share is reflected on withholding.

7.2 Implications for practitioners

The common emphasis on intrinsic motivation can be problematic in the work context as not all work is interesting, or fun, and rarely is any work fun all the time. Hence, the finding that the sense of importance, more than interest, promotes KS should be quite interesting for practitioners. The study suggests that managers who wish to fuel KS in work meetings should instill a sense of importance with participants. This can be achieved by adopting an autonomy-supportive management style (Gagné *et al.*, 2000), which entails communicating more clearly why active engagement in KS at work meetings is so important, acknowledging resistance, concerns and emotions and taking into account that participants need sufficient say and choice in the work forums they partake.

Finally, the study demonstrated that external motivation to share was negatively associated with KS but positively with knowledge withholding. In light of these findings, the deeply rooted attraction to material incentives as motivators is puzzling. Not only do they appear to be ineffective, and sometimes directly detrimental, as the case was in this study, but they are also an expensive means of motivation.

7.3 Possible areas for future research

Considering that the quality of motivation is particularly important for knowledge-based work (Gagné, 2009), more research is needed to understand how the quality of motivation influences KS. This study used a range of qualities of motivation and found them to differently predict KS in work meetings. Therefore, a more nuanced conceptualization of motivation to include the presently underinvestigated motivation qualities, identified and introjected motivation is justified in future research. Especially interesting is the finding that identified motivation, the sense of importance, was more important than intrinsic motivation. Whereas the authors believe that the results are applicable to many other KS contexts beyond work meetings, including technology-mediated KS, future research should establish this. Future research should also establish whether the results can be repeated in other geographies. The authors also advocate care in how KS is defined and operationalized and encourage future researchers, especially those relying theoretically on

SDT, to use validated SDT-based measures for the different motivation types, enabling more justified conclusions based on accumulated findings. In addition to investigating their differential impact, future research could also examine their synergistic influences on KS.

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Appendix 1

Table AI Convergent validity; dependent variable tacit knowledge sharing

Construct	*Items*	*Factor loading*	*Mean*	*SD*
Intrinsic motivation	intrin1	0.735	4.69	1.38
CR = 0.864; AVE = 0.681	intrin2	0.812	3.86	1.46
	intrin3	0.919	4.05	1.47
Identified motivation	ID1	0.777	5.81	0.93
CR = 0.726; AVE = 0.574	ID3	0.733	5.79	1.00
Introjected motivation	intro2	0.688	3.60	1.48
CR = 0.747; AVE = 0.599	intro3	0.851	4.51	1.46
External motivation	EX1	0.680	3.35	1.46
CR = 0.758; AVE = 0.515	EX2	0.843	3.90	1.42
	EX3	0.611	3.68	1.47
Tacit KS	TKS2	0.606	6.46	0.60
CR = 0.744; AVE = 0.500	TKS3	0.815	5.87	0.86
	TKS4	0.677	5.68	0.99

Table AII Bivariate correlations and discriminant validity; dependent variable tacit knowledge sharing

	Intrinsic	*Identified*	*Introjected*	*External*	*Tacit KS*
Intrinsic	*0.825*				
Identified	0.488***	*0.755*			
Introjected	0.248**	0.592***	*0.774*		
External	0.463***	0.303**	0.542***	*0.718*	
Tacit KS	0.104	0.480***	0.262**	0.111	*0.705*

Note: Figures on the diagonal are square roots of average variance extracted for the latent constructs

Table AIII Convergent validity; dependent variable knowledge withholding

Construct	*Items*	*Factor loading*	*Mean*	*SD*
Intrinsic motivation	intrin1	0.737	4.69	1.38
CR = 0.864; AVE = 0.681	intrin2	0.813	3.86	1.46
	intrin3	0.916	4.05	1.47
Identified motivation	ID1	0.770	5.81	0.93
CR = 0.726; AVE = 0.570	ID3	0.739	5.79	1.00
Introjected motivation	intro2	0.689	3.60	1.48
CR = 0.747; AVE = 0.599	intro3	0.850	4.51	1.46
External motivation	EX1	0.680	3.35	1.46
CR = 0.758; AVE = 0.515	EX2	0.843	3.90	1.42
	EX3	0.610	3.68	1.47
Knowledge withholding	WH1	0.695	2.32	1.25
CR = 0.769; AVE = 0.527	WH2	0.701	3.22	1.54
	WH3	0.779	3.26	1.52

Table AIV Bivariate correlations and discriminant validity; dependent variable knowledge withholding

	Intrinsic	*Identified*	*Introjected*	*External*	*K withholding*
Intrinsic	*0.826*				
Identified	0.490***	*0.755*			
Introjected	0.249**	0.592***	*0.774*		
External	0.464***	0.304**	0.542	*0.718*	
K withholding	−0.070	−0.283**	−0.139	0.171*[a]	*0.726*

Notes: Figures on the diagonal are square roots of average variance extracted for the latent constructs; [a]$p = 0.05$

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