Understanding knowledge sharing in the work context by applying a belief elicitation study

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Received 20 December 2014
Revised 31 January 2015
5 February 2015
Accepted 6 February 2015

This study was supported by The Emil Aaltonen Foundation, Finland, for the part of the corresponding author's doctoral work.

Abstract

Purpose – *This paper aims to investigate cognitive antecedents of knowledge sharing (KS) by applying a belief elicitation study and embedding KS in an organizationally relevant context, work meetings.*

Design/methodology/approach – *The study was carried out in two phases: an elicitation study (*n *= 18), and a survey (*n *= 200) based on its findings. The method, which combines a qualitative and a quantitative approach, is frequently used in the study of other behaviors (e.g. health behaviors) when applying the theory of planned behavior (TPB).*

Findings – *Belief-based measures, informed by the elicitation study, were meaningful predictors of KS intentions. In line with TPB, attitudes, subjective norms and perceived behavioral control explained 47.7 per cent of the variance in KS intentions, which together with perceived behavioral control explained 55.2 per cent of the variance in KS behavior. Behavioral beliefs reflecting positive collective outcomes (new perspectives, knowledge diffusion/collective learning, increased interaction) were the most important predictors.*

Research limitations/implications – *Single organization and the study design limit generalizability of the results.*

Practical implications – *The findings suggest that by eliciting shared beliefs relating to specific KS behaviors, organizations may come a long way in understanding and subsequently influencing these behaviors.*

Originality/value – *This is the first study to apply TPB on KS by investigating the underlying beliefs using an elicitation study. By demonstrating its utility, the study not only lays avenue for evidence-based interventions to improve KS in organizations, but also presents a method that bridges the gap between quantitative and qualitative approaches to KS.*

Keywords *Behavior, TPB, Knowledge sharing, Intention, Theory of planned behavior, Elicitation study*

Paper type *Research paper*

1. Introduction

Organizations are increasingly dependent on knowledge for success, and consequently, knowledge is considered a critical organizational resource in today's knowledge-based economy (Grant, 1996; Nahapiet and Ghoshal, 1998; Yi, 2009). The key concern is how to best utilize the collective knowledge pool, as there is abundant evidence that efficient knowledge use can result in positive organizational outcomes, such as enhanced performance, productivity or innovation capabilities (Cummings, 2004; Lin, 2007b; Mesmer-Magnus and DeChurch, 2009). From an organizational perspective, value creation takes place when relevant knowledge is shared (Sveiby, 2001), but whereas the emphasis has long been on finding ways to capture and distribute knowledge through systems, it is today clear that crucial for knowledge-based work is how knowledgeable individuals interact (Wang and Noe, 2010). Hence, it is increasingly important to understand what drives meaningful behavior in knowledge-intensive environments, specifically knowledge sharing (KS).

> **"The study suggests that belief elicitation is a feasible approach to understanding predictors of Knowledge Sharing."**

Research has shed light on various aspects of KS, across a wide variety of disciplines (Witherspoon *et al.*, 2013), but many challenges remain. Even if evidence on numerous plausible antecedents of KS (Witherspoon *et al.*, 2013) has accumulated, what continues to be problematic is the multitude of definitions of, and the lack of validated measures for KS. It is generally appreciated that the behavior is complex and may take many forms, be related to various types of knowledge or occur in a number of different forums (Wang and Noe, 2010; Yi, 2009), but this has not always been acknowledged in the research or the conclusions drawn based on the research. Some recent discussions (Crane and Bontis, 2014) have revitalized earlier debates on the nature of individual and organizational knowledge (Grant, 1996; Nonaka and Takeuchi, 1995; Spender, 1996; Tsoukas, 1996), and despite different epistemologies, there seems to be a growing number of advocates for the view that KS is best understood in the relevant work context or practice (Crane and Bontis, 2014; McIver *et al.*, 2012; von Krogh *et al.*, 2012).

One of the most used theories in KS research has been the theory of planned behavior (TPB; Ajzen, 1988), or its predecessor the theory of reasoned action (TRA; Ajzen and Fishbein, 1980) (Bock *et al.*, 2002; Chennamaneni *et al.*, 2011; Lin, 2007a). To our knowledge, the study at hand is, however, the first to explore the utility of a belief elicitation study, as strongly recommended by the developers of the theory (Fishbein and Ajzen, 2010). Also in line with the theory, KS is defined as a range of tangible behaviors embedded in a relevant context. Hence, the present study contributes to KS research by investigating how shared beliefs, elicited in a separate qualitative study, predict KS intentions and behavior in the larger organization. It also demonstrates that TPB continues to present a viable approach to KS, in particular for understanding KS in context.

2. Approaches to KS

Davenport and Prusak (1998) define knowledge as "a fluid mix of framed experiences, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms". This elucidates the complex nature and extensive scope of the term knowledge. It becomes even more challenging, when combined with sharing, which may refer to both donating and receiving (Cabrera *et al.*, 2006; van den Hooff and de Ridder, 2004), or just the former (Bock *et al.*, 2002; Chennamaneni *et al.*, 2011), and take many forms and mean many things in terms of behavior. As we advocate a more hands-on approach to KS in organizations, revisiting some key discussions in the literature makes sense.

The key pursuit in knowledge management (KM) research has been to understand how value can be created from the collective knowledge pool in organizations. In his contribution to the knowledge-based theory of the firm, Grant (1996) emphasized the role of coordination for optimal knowledge integration, and proposed four ways to accomplish this: rules and directives; routines; sequencing; and, finally, group problem-solving and decision-making, which take place in meetings. The first three mechanisms focus on efficiency, whereas the last recognizes that some group processes in a firm carry a higher cost and require more meaningful interaction (Grant, 1996). These forums, also the focus of this study, can only be successful if those participating engage in them.

Spender (1996) posits that much of what we know is socially constructed. As a social being, an individual internalizes his social surroundings, the knowledge embedded in work, ways to work and interactional patterns. Tsoukas (1996) argues that individual knowledge is possible only because of the social practices individuals engage in. Nonaka and Takeuchi (1995) stress socialization as the process where tacit knowledge is learned in social interaction. However, we understand organizationally relevant knowledge, there seems to be an agreement that individuals come to know the work-related knowledge in social interaction, including the shared beliefs. Hence, it is important to understand the social context where individuals learn and apply existing knowledge in interaction with others.

The distinction between explicit and tacit knowledge (Polanyi, 1962) has been very important in the contemporary KM literature, specifically the interpretation of Nonaka and Takeuchi (1995). Their popular SECI model explains how knowledge is transformed from tacit to explicit and vice versa in circular processes in interaction with others and in the simultaneous mental processes. Explicit here refers to easily verbalized knowledge, whereas tacit is hard to express with words (Nonaka and Takeuchi, 1995). The distinction is, however, elusive as all knowing, in line with Polanyi (1962), necessitates a tacit element, a human ability to make sense of even explicit knowledge (Crane and Bontis, 2014; McIver *et al.*, 2012). Knowing is inseparable from individuals and its value emerges from actions of people. Hence, the focus should move onto the specific things that people do in work situations (McIver *et al.*, 2012; Sveiby, 2001). This brings us closer to the organizational reality, where it is neither possible nor practical to operate with concepts such as tacit and explicit knowledge, but where it is important to understand what drives the behavioral acts that result in the best possible utilization of collective experience. It moves the focus away from what people might know to what they do with what they know (McIver *et al.*, 2012). A related topic is how this is best studied in terms of methodology. Some advocate qualitative methods and the study of speech acts (Crane and Bontis, 2014). The present study suggests that a qualitative study into the underlying beliefs is combined with a quantitative survey, and the focus moved on to behavioral acts in the selected work context.

The above suggests that what people do with what they know in specific contexts should be center stage in KS research. The study at hand uses the definition of Yi (2009), who defines KS as "a set of individual behaviors involving sharing one's work-related knowledge and expertise with other members within one's organization, which can contribute to the ultimate effectiveness of the organization". Of the four different KS behaviors she identifies, the present study focuses on KS in formal interactions, and operationalizes it as tangible behaviors (e.g. I proposed solutions to problems) embedded in a regular work context (in work meetings). It therefore presents a reasonable approach to KS and is also in line with the tenets of the TPB.

3. Antecedents of KS based on TPB

Two major reviews (Wang and Noe, 2010; Witherspoon *et al.*, 2013) map the present state of research into the antecedents of KS rather comprehensively. In their meta-analysis of 46 studies, Witherspoon *et al.* (2013) found 14 antecedents, including those generally associated with KS when TPB is used (i.e. attitudes, subjective norms, control perceptions). They encouraged future research to focus on the idiosyncratic predictors of KS in specific contexts.

"For managers the only Knowledge Sharing drivers of interest are typically those that concern their own organization."

> **"Instead of attempting to influence employee beliefs directly, one approach is to develop the work context or conditions that these beliefs concern."**

Studies applying TPB have to date either measured attitudes only (Chen, 2011; Kuo and Young, 2008), or made educated assumptions on what might underlie these attitudes (Bock *et al.*, 2002; Chennamaneni *et al.*, 2011; Chow and Chan, 2008). The weakness of measuring direct attitudes only is that we are not informed of what belief structures might underlie them. *Ad hoc* or general attitudinal antecedents may again result in poorly justified causal inferences, especially when analyzed with cross-sectional data. Also, as evidenced in a number of studies (Chen and Hung, 2010; Lin, 2007b), perceived behavioral control seems to predict KS, but the beliefs influencing these perceptions are not well-understood. The present study makes an inquiry into these beliefs.

3.1 The theory of planned behavior

The TPB (Ajzen, 1988), previously the TRA (Ajzen and Fishbein, 1980) and today also the reasoned action approach (Fishbein and Ajzen, 2010), is an expectancy value theory developed over nearly half a century to explain and predict any social behavior (Fishbein and Ajzen, 2010). TPB posits that three factors, namely, attitudes, subjective norms and perceived behavioral control, predict any behavioral intentions, which in turn predict the actual behavior. Attitudes, norms and perceived behavioral control are guided by beliefs, and it is at this level of inquiry that most insight into the reasons behind a specific behavior can be gained. According to TPB, an underlying mix of beliefs operates in the background guiding an individual's behavioral intentions and subsequent behavior in a logical, predictable and consistent fashion (Fishbein and Ajzen, 2010).

Attitudes have been a major target for investigation for decades due to their assumed relationship with behavior. Empirical research has, however, not lent strong support to the intuitively appealing assumption that general attitudes predict behavior. For Fishbein and Ajzen (2010), attitude refers to a specific attitude toward performing a specific behavior, based on an evaluation of the believed outcomes resulting from the behavior. It is these outcome expectances, salient behavioral beliefs, that are of interest, and which in combination determine an individual's attitude toward performing the behavior. Only a small number of beliefs, those that come readily to mind, however, influence the behavior (Fishbein and Ajzen, 2010).

Subjective norms reflect normative beliefs, an individual's subjective assessment of how significant others expect one to behave (injunctive norms), or how they themselves behave in similar situations (descriptive norms). There may be specific groups, usually peers and superiors in the work context, who exercise more pressure than others (Fishbein and Ajzen, 2010).

In addition to a favorable attitude and social pressure, individuals need a degree of certainty that they are able to perform a behavior successfully. Control beliefs reflect beliefs about personal and external factors that either facilitate or impede action. They underlie perceived behavioral control, which is conceptually similar to the sense of self-efficacy (Bandura, 1997). There are essentially two elements. One relates to the sense of capacity, the degree of ease or difficulty to perform a behavior, and the other to the sense of autonomy, the degree of authority or the presence of obstacles, to perform a behavior (Fishbein and Ajzen, 2010).

3.2 TACT principle

One of the key tenets of TPB is that the behavior of interest is defined clearly. All beliefs are elicited, and all constructs in the survey defined, in reference to this behavior. The definition should capture four elements: Target, Action, Context and Time (i.e. the TACT principle). Most behaviors are directed at some target, imply behavioral acts, take place in a context and at a certain time (Fishbein and Ajzen, 2010; Francis *et al.*, 2004).

Any behavior is difficult to define in very precise terms while continuing to make sense for the larger research goals. It is, however, particularly challenging for a complex behavior such as KS (Yi, 2009), which may mean a range of both behaviors and targets of behavior. Measuring KS with items such as "I will try to share knowledge with my colleagues" is problematic in the TPB framework. It is unclear what sharing in terms of behavior means, and knowledge again may mean different things to different people. Ideally KS should be translated into concrete behaviors taking place in a context, ideally one where KS is particularly desirable, and within a time frame.

3.3 Elicitation of beliefs

As the theory proposes a strong link between underlying behavioral beliefs and the behavior, a recommended approach is to elicit such beliefs from a representative sample, either as an individual or focus-group interview, or through a questionnaire (Francis *et al.*, 2004). There are standardized procedures for how to conduct an elicitation study (Francis *et al.*, 2004). The participants are, for instance, asked to name advantages and disadvantages of personally performing the behavior, or factors that make it easier or harder to perform the behavior. Once the beliefs are elicited, the most frequently shared ones (modal salient beliefs) are identified and used to develop the belief-based survey items (Fishbein and Ajzen, 2010; Francis *et al.*, 2004), as was done in the present study.

3.4 Research model and hypotheses

The research model (Figure 1) is based on TPB and derived from the schematic presentation of the TPB model (Fishbein and Ajzen, 2010) with some modifications. As per the basic postulates of TPB, attitudes, subjective norms and perceived behavioral control predict behavioral intentions. Their relative importance may vary from behavior to behavior, but it is reasonable to assume that each shares some unique variance with KS intentions. Hence, we hypothesize that:

H1. Attitudes (based on the elicited outcome beliefs), subjective norms (containing both injunctive and descriptive items, and capturing both superior/peer pressure) and perceived behavioral control each have unique predictive utility for KS intentions.

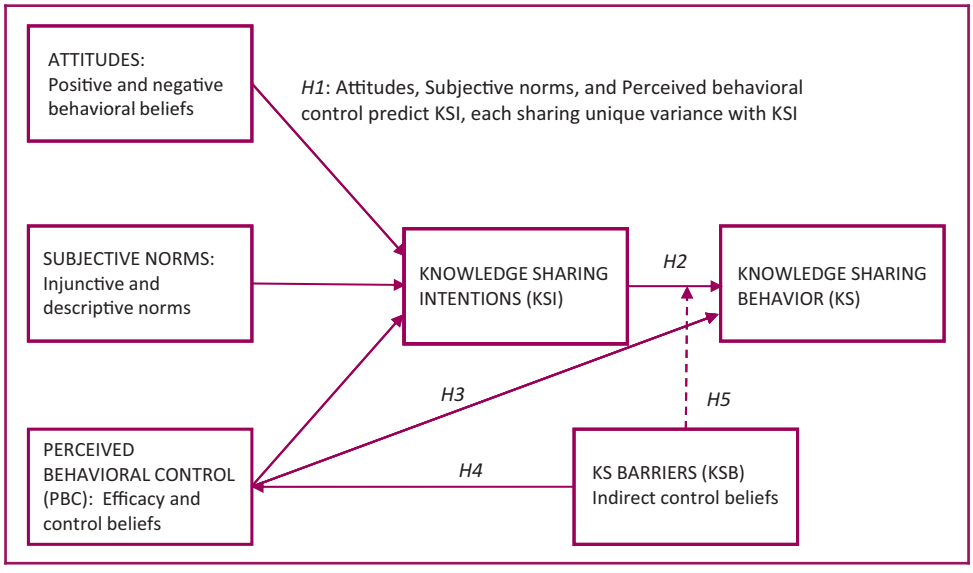
Furthermore, a basic assumption in TPB is that intentions to perform a behavior are highly predictive of actual behavior. Ajzen (1991) further posits that no matter how strong the intention to perform a behavior, it still to some degree depends on personal and external control factors. Accordingly, we hypothesize that:

H2. KS intentions are positively related to KS behavior, and mediate the effects of attitudes, subjective norms and perceived behavioral control.

H3. Perceived behavioral control is also, independently of KS intentions, positively related to KS behavior.

"Identifying the behavioral influencers that prevail in a particular work context, and acting upon them rather than a set of assumed influences could be highly effective."

Figure 1 The research model



Perceived behavioral control essentially contains beliefs that relate to one's personal sense of efficacy to perform a behavior and one's perception of control in the situation. It is assumed that KS barriers identified in the elicitation study reflect the indirect control beliefs behind perceived behavioral control, and thus we hypothesize that:

H4. KS barriers (based on elicited control beliefs) are negatively related to perceived behavioral control.

Usually the control beliefs are schematically placed behind perceived behavioral control. As these beliefs in terms of content reflect external barriers, we have assumed their role to be more complicated. In accordance with Fishbein and Ajzen (2010), KS barriers may interfere with the relationship between KS intentions and KS behavior. We therefore hypothesize that:

H5. KS barriers (based on elicited control beliefs) moderate the relationship between KS intentions and KS behavior.

A further aim is to understand what the elicited beliefs underlying attitudes, norms and control perceptions are in terms of content in the present study.

4. Method

This survey-based study was conducted in a major public sector organization in Finland. It was selected because all employees in this entirely knowledge-based organization are experts, operating in a sector under tremendous external pressure to become more efficient. In consequence, KS is crucially important for its continual performance.

4.1 Data collection

The data collection was carried out in two phases: the elicitation study and the survey. Francis *et al.* (2004) recommend a sample size of 25, and thus 30 employees in various functions and locations in the organization were invited to partake in the elicitation study, whose findings would be utilized for a company-wide survey. Eighteen complete questionnaire responses were received back. These were content analyzed, and used to formulate the survey items. Subsequently, all employees in the organization were invited, by an email, to participate in the survey. From 685 employees, 200 completed the survey, corresponding to a response rate of 29.2 per cent. The elicitation study was conducted in

October 2013 and the survey in February 2014 (over a period of three weeks), using Webropol Online Survey and Analysis Software.

4.2 Measures

4.2.1 Elicitation study. The study followed the procedures by Francis *et al.* (2004). The questionnaire started with a definition of KS, outlining specifically what was meant in terms of behavioral acts, as follows: "Active KS in work meetings refers to the extent that one presents ideas, views, suggestions and e.g. solutions to problems, and offers one's own experience-based knowledge for the benefit of others in team- and other work meetings. It also refers to the degree that one responds to the questions of others, encourages others to participate and present their views in the meetings". The definition was derived from Yi's (2009) validated measure for KS in formal interactions (used in the survey to measure KS). Work meeting was further defined to mean any work-related get-together, formal and informal. Importantly, beliefs should be elicited for the same specific behavior(s) as investigated in the survey.

The respondents were then asked a range of open-ended questions regarding the expected positive and negative outcomes resulting from the behavior, normative concerns and conditions facilitating versus impeding the behavior. To elicit outcome beliefs, those explaining attitudes, the question was phrased "What in your mind are the advantages (disadvantages) of active KS in work meetings?". To elicit normative beliefs, those explaining subjective norms, the question was "Are there any groups of individuals that would approve (disapprove) of your active KS in work meetings?". To elicit control beliefs, those explaining perceived behavioral control, the question phrased was "What factors would facilitate (impede) your active KS in work meetings?".

4.2.2 Survey. All measures were formulated with regard to the same specific definitions of KS and work meeting as in the elicitation study. The measure for KS behavior captured the specific acts in its definition by using five items from Yi's (2009) scale, e.g. "I expressed ideas and views", or "I suggested solutions to problems", etc. The scale of five ranged from "very seldom" to "very often" and had good internal consistency at $\alpha = 0.83$. The intention to share knowledge ($\alpha = 0.92$) was measured with three items, i.e. "I intend to [. . .]", "I expect to [. . .]" and "I want to [. . .]", and making a reference to the definition of KS. These were measured with a scale of seven ranging from "completely disagree" to "completely agree". The time frame used was two months.

The survey included both direct and indirect measures of beliefs, as per Francis *et al.* (2004). The indirect measures were based on the most frequently mentioned beliefs in the elicitation study by turning them into personalized items such as: "If I engage in active KS in work meeting, I inspire others and the interaction improves", or "My active KS is impeded if the atmosphere is poor". These were measured with a scale of seven ranging from "completely disagree" to "completely agree". In this study, belief strength was not separately measured, as we assumed it to be captured in the overall degree of agreement with a statement.

No direct measures were used for attitudes. A positive attitudinal construct was created from the positive behavioral beliefs and a negative one from the negative beliefs. The direct measure for subjective norms included two items for injunctive and one for descriptive norms, and both peers and superiors as significant others. The direct measure of perceived behavioral control included two measures: efficacy beliefs and control beliefs, in line with TPB (Fishbein and Ajzen, 2010). Efficacy beliefs contained two items for self-efficacy (Bandura, 1997) and three items for knowledge self-efficacy (Spreitzer, 1995). Furthermore, two items measuring the sense of situational control were included (one was omitted later to improve internal consistency). Indirect control beliefs, subsequently labeled KS barriers, were based on the elicitation study. All items used in the survey are found in Appendix 1.

4.3 Content and statistical analyses

The elicitation study was content analyzed as per instructions by Francis *et al.* (2004). Ideas brought up by the respondents were coded and counted, and similar ideas grouped thematically. The most frequently mentioned ideas were used for belief-based items in the survey. Virtually, all ideas could be somehow captured, as there were not that many different ones.

All quantitative analyses were conducted using the SPSS22 software. To investigate the survey item structure, exploratory factor analyses were conducted using maximum likelihood method with Varimax rotation. *H1-H4* were examined using bivariate correlations and linear hierarchical regression analyses. The moderation hypothesized in *H5* was tested by creating an interaction term, which was done by multiplying the moderator variable with the independent variable. The test was conducted without additional variables.

5. Results

The findings of the elicitations study were used for the survey items and are therefore presented first.

5.1 Elicitation study

In terms of positive behavioral beliefs, the study (n = 18) elicited five beliefs that were to some degree overlapping. Bringing new perspectives to the issues at hand (n = 13; 72 per cent), promoting knowledge diffusion (n = 7; 39 per cent) and activating others to increase interaction (n = 7; 39 per cent) were the most frequently mentioned positive beliefs. Some also mentioned the importance of giving everyone a say, and some that active KS fosters progress and decision making. Four items capturing the essence of the ideas raised were formed for the survey.

In terms of negative behavioral beliefs, the study elicited two themes: time concerns (n = 8; 44 per cent) and the worry over meandering to wrong topics (n = 8; 44 per cent). Two items were formed from these for the survey. Generally fewer negative outcomes were identified; half of the respondents instead pointed out that dominating participants prevent others from participating. Being a barrier to KS, this was included in the items measuring indirect control beliefs.

No specific groups of people exercising normative pressure on KS were identified in the elicitation study and hence these were assumed to be superiors and peers in the subsequent survey.

Positive and negative control beliefs largely mirrored each other. The most frequently mentioned was how the chair of the meeting treated others. A facilitating chair encouraged active participation, was fair but determined (n = 11; 61 per cent), whereas an impeding chair was either too weak or too strong, or lacked the necessary skills (n = 10; 55 per cent). Too many or wrong participants impeded activity (n = 7; 39 per cent). Good preparedness facilitated (n = 10; 55 per cent) and poor prohibited (n = 9; 50 per cent) active KS, whereas good atmosphere fuelled (n = 5; 28 per cent) and poor discouraged (n = 5; 28 per cent) active KS. Altogether six KS barriers were formulated from these beliefs.

5.2 Survey

Demographic information is presented in Table I. Two items stand out: the relatively high average age at 49.3 years, and the very high level of education. Some 58.0 per cent of the participants had a higher academic degree and a further 31.5 per cent a bachelor's degree or equivalent. Furthermore, over half (55.0 per cent) of the participants had been with the organization for over 10 years. Only the managerial position and years in the current job correlated significantly, albeit weakly, with KS intentions and/or KS behavior, and were therefore used as control variables, while the others were omitted.

Table I Respondent demographic characteristics

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 above	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
Years in current job (n = 185)	0-1 years	54	29.2
	1-5 years	73	36.5
	5+ years	58	31.4
Job role (n = 200)	Specialist	168	84.0
	Team leader (also specialist)	26	13.0
	Manager position	6	3.0

An exploratory factor analysis (EFA) was conducted to ensure that all items, specifically those created from the elicitation study, loaded on the constructs as expected, which they did (KMO = 0.718; Bartlett's sphericity $p < 0.001$). Factors were extracted using maximum likelihood method with Varimax rotation. The EFA (see Appendix 2) was used as the basis for the composite variables: positive attitude (PA; α = 0.81), negative attitude (NA; α = 0.72), subjective norms (SN; $\alpha = 0.73$), efficacy beliefs ($\alpha = 0.77$), control beliefs ($\alpha = 0.56$) and KS barriers ($\alpha = 0.70$). KS barriers loaded onto two different factors, but only one (with five items) was used due to low internal consistency of the other (α = 0.53). A further composite variable was formed for perceived behavioral control by combining efficacy beliefs and a single item (due to low α) from control beliefs (α = 0.75).

Table II presents means and standard deviations of the study variables and correlations between them. The means of all variables with KS supportive content exceeded clearly the scale midpoint, suggesting a relatively KS-friendly organization. All independent variables except negative attitudes correlated significantly with KS intentions. Multiple regression analyses were conducted to further examine the relationships. When simultaneously in the model (Table III), positive attitudes, subjective norms and perceived behavioral control each demonstrated unique predictive utility for KS intentions, lending support to *H1*. Perceived behavioral control was clearly the strongest predictor ($\beta = 0.46$, $p < 0.001$), but both positive attitudes ($\beta = 0.24$, $p < 0.001$) and subjective norms ($\beta = 0.20$, $p < 0.001$) carried a substantial weight as well. Overall, the model explained 47.7 per cent (R_a^2 = 0.477, $F(4,189) = 45.042$, $p < 0.001$) of the variance in KS intentions.

KS intentions and KS behavior were highly correlated ($r = 0.71$, $p < 0.001$), as assumed by TPB, lending support to *H2*. Table IV presents an analysis where KS behavior is regressed on all independent variables, and on the last step also on KS intentions. In line with TPB, KS intentions subsumed all shared variance of the other predictors except for perceived behavioral control, which also shared independent variance with KS behavior. Consequently, *H3* was supported. Overall, the model explained 55.2 per cent ($R_a^2 = 0.552$, $F(5,188) = 48.504$, $p < 0.001$) of the variance in KS behavior, lending strong support to the utility of a TPB-based research model.

The correlation between KS barriers and perceived behavioral control was negative and significant ($r = -0.30$, $p < 0.001$), lending support to *H4*. An additional post hoc analysis showed that one item, dominating participants, correlated more strongly than the others ($r = -0.35$, $p < 0.001$) with perceived behavioral control. The other items correlated weakly or not at all. The experience that some individuals dominate the meeting with strong views

Table II Pearson correlation coefficients (n = 194), all variables

Variables	*Mean*	*SD*	*KS*	*KSI*	*PA*	*NA*	*SN*	*PBC*
KS	3.80	0.61						
KSI	5.90	0.88	0.71**					
Positive attitude	5.72	0.68	0.46**	0.49**				
Negative attitude	3.78	1.34	−0.18*	−0.14	−0.12			
Subjective norms	5.07	1.04	0.31**	0.42**	0.28**	−0.15*		
Perceived BC	5.33	0.79	0.62**	0.62**	0.42**	−0.20**	0.33**	
KS barriers	5.40	0.85	−0.04	−0.14*	0.00	0.20**	−0.07	−0.30**

Notes: KS = knowledge sharing behavior (scale 1-5, all others 1-7); KSI = knowledge sharing intentions; PA = positive attitude; NA = negative attitude; SN = subjective norms; PCB = perceived behavioral control; KSB = KS barriers; **correlation is significant at the 0.01 level; *correlation is significant at the 0.05 level (two-tailed)

Table III Predictors of KS intentions (n = 194)

	Step 1		*Step 2*		*Step 3*	
Variables	*β*	p	*β*	p	*β*	p
Positive attitude	0.48	< 0.001	0.40	< 0.001	0.24	< 0.001
Negative attitude	−0.08	0.201	−0.04	0.469	0.01	0.803
Subjective norms			0.30	< 0.001	0.20	< 0.001
Perceived behavioral control					0.46	< 0.001
R^2	0.247		0.327		0.488	
R^{a2}	0.239		0.316		0.477	

Table IV Predictors of KS behavior (n = 194)

	Step 1		*Step 2*		*Step 3*		*Step 4*	
Variables	*β*	p	*β*	p	*β*	p	*β*	p
Positive attitude	0.44	< 0.001	0.40	< 0.001	0.23	< 0.001	0.11	0.060
Negative attitude	−0.12	0.064	−0.10	0.130	−0.04	0.803	−0.04	0.387
Subjective norms			0.19	0.005	0.08	< 0.001	−0.02	0.784
Perceived behavioral control					0.48	< 0.001	0.26	< 0.001
KS intentions							0.50	< 0.001
R^2	0.224		0.257		0.436		0.563	
R^{a2}	0.216		0.245		0.424		0.552	

was repeatedly brought up in the elicitation study. The role of KS barriers was explored further by including it in a regression model where KS behavior was regressed on attitudes, subjective norms, perceived behavioral control and KS barriers. Even if KS barriers did not correlate with KS behavior, the beta of KS barriers became significant and positive. A plausible explanation is suppression. It appears that while correlating with perceived behavioral control, KS barriers adds variance to it, reducing thereby its relationship with KS behavior. When added to the model, KS barriers suppresses this unwanted variance and the relationship between perceived behavioral control and KS behavior strengthens (Cohen *et al.*, 2003). This additional finding will be elaborated in the Discussion section.

KS barriers did not moderate the relationship between KS intentions and KS behavior (p = 0.189) and thus *H5* was not supported.

When the control variables, managerial position and time in current job, were added to the regression models, they had virtually no impact on the results.

6. Discussion

The present study is the first to investigate cognitive antecedents of KS in the context of work meetings by applying a combination of a belief elicitation study and a subsequent survey. Work meetings were identified as a critical KS forum in the organization studied. As hypothesized,

positive attitudes (but not negative), subjective norms and perceived behavioral control each predicted KS intentions independently (*H1*). Furthermore, KS intentions were positively related to KS behavior, and mediated the effects of attitudes, subjective norms and perceived behavioral control (*H2*), but perceived behavioral control predicted KS behavior also independently (*H3*). KS barriers were negatively related to perceived behavioral control (*H4*), but did not moderate the relationship between KS intentions and KS behavior (*H5*). All hypotheses were supported, with the exception of *H5*, and the negative attitudes in *H1*.

Positive attitudes, based on separately elicited behavioral beliefs, predicted KS intentions remarkably well. In terms of content, these elicited beliefs were essentially collective concerns. Respondents believed that KS in work meetings implied a better process, as new perspectives were brought up. KS was also thought to fuel interaction, thereby fostering knowledge diffusion and collective learning. This resonates with the findings of Titi Amayah (2013), whose study demonstrated that community-related considerations were highly predictive of KS. Chow and Chan (2008) found that shared goals, also a collective concern similar to ours, was a strong predictor of attitudes to KS. The elicitation study did not raise any individualistic or instrumental concerns, unlike many other studies that suggest that, e.g., perceived reciprocal benefits (Lin, 2007a), reputation enhancement and loss of knowledge power (Wu and Zhu, 2012) explain attitudes to KS. The absence of individualistic concerns in the present study may be a reflection of a healthy work environment, good morale or leadership. Over half of the respondents had been with the organization for over 10 years, which may be tell-tale of the same. Alternatively, they were not concerns in the particular context.

As in other studies (Chennamaneni *et al.*, 2011; Chow and Chan, 2008; Wu and Zhu, 2012), subjective norms also predicted KS intentions. Perceived behavioral control, essentially self-efficacy and knowledge self-efficacy, predicted both KS intentions and KS behavior, in line with TPB, and in line with various prior studies (Chennamaneni *et al.*, 2011; Lin, 2007a). The indirect control beliefs, elicited separately, correlated only moderately with perceived behavioral control ($r = -0.30$, $p < 0.001$). In terms of content, they reflected external KS barriers, which presumably explains this. Interestingly, even if over 90 per cent of the respondents agreed that these were barriers to their active KS in work meetings, they correlated only weakly with KS intentions and not at all with KS behavior. One possibility is that even if perceived as KS barriers, they did not occur frequently enough to show in the reports of actual behavior. A further examination, however, indicated suppression, i.e. that KS barriers suppress the relationship between perceived behavioral control and KS behavior. This means that the identified KS barriers operate by niggling at individuals' perceptions of behavioral control, which for its part was highly predictive of KS behavior. A single item, dominating individuals, appeared to be the most important impediment to other people's sense of control to actively contribute at work meetings. The experience that work meetings were typically dominated by someone was also negatively and directly associated with KS.

To sum up, positive attitudes reflecting a good understanding of the collective benefits of KS and interaction, subjective norms favoring sharing and perceived behavioral control predicted KS intentions remarkably well ($R_a^2 = 47.7$ per cent), which in turn predicted KS behavior together with perceived behavioral control ($R_a^2 = 55.2$ per cent). TPB with its emphasis on attitudinal, normative and control elements as the key antecedent conditions proved once again to be an effective framework to predict KS, this time with emphasis on readily accessible shared beliefs. As the approach focuses on conscious cognitive constructs, it is not able to capture all antecedents of any behavior. The more distal influencers, such as organizational culture, are assumed to be reflected in the shared beliefs even if their nature is not examined in the study.

The study demonstrated that elicitation of beliefs can be a meaningful way to explore predictors of KS -enabling-targeted interventions. The approach is frequently used, for instance, in health psychology, where belief elicitation is used as the basis for evidence-based development of behavior change interventions (Epton *et al.*, 2014; Sutton, 2010). Notwithstanding the contributions of studies using *ad hoc* or general predictors, what the belief elicitation may do is

capture those beliefs that are widely shared and genuinely influence behavior in a particular organization and context, thereby reflecting the idiosyncratic mix of influences and everyday concerns that exist in a particular work environment. The present study generated concrete ideas for the organization on how to develop their meeting culture and what to focus future management training on. Such training should address the shared concerns (e.g. develop the skills to run effective meetings, manage dominating individuals and foster the sense of self-efficacy of all participants, raise awareness of the collective benefits of active participation and tackle the identified KS barriers). These ideas may not be directly transferable to other contexts, or organizations, but the method to elicit shared beliefs underlying KS in the relevant work context is.

6.1 Limitations

Translating elicited beliefs into survey items was not entirely easy. In this study, we also did not ask the respondents to weigh the beliefs for concerns over survey length, which, however, might have made a difference for the control beliefs. The work context, which now referred to any kind of a work meeting, could have also benefited from a narrower definition. It is possible that the respondents understand "knowledge" differently. The detailed definition of KS as specific behaviors (as recommended by Ajzen and Fishbein, Fishbein and Ajzen, 2010) should have, however, guided the respondents to think about KS in a similar way.

As most (or all) studies into predictors of KS, the study relied on cross-sectional data. This is problematic for causal inferences, but it presents a further problem when intentions and behavior are measured at the same time. Intentions are by definition forward-looking, whereas behavior is something that has already happened. As we operated within a relatively short time frame, two months, it is not unreasonable to assume that a measure of current behavior is largely reflective of what this behavior will be two months later. Using common source may strengthen the relationships between similar constructs. The study design focusing on a specific context and 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. High frequency of surveys in this organization is a plausible reason for the somewhat lackluster participation. The demographic profile in the study corresponds to that of the organization, and very few missing responses suggests an overall good data quality.

7. Conclusions

Elicitation of behavior-related beliefs offers an interesting alternative to *ad hoc* or general antecedents of KS when TPB is used as the general framework. The study at hand introduces a promising start. The approach necessitates rigor in identifying critical behaviors and a relevant work context where these behaviors are particularly desirable. Behavior always takes place in a context and exposing the affordances and limitations in a particular work environment may prove useful. Whereas the generalizability of the findings to other contexts may be limited, what we gain is actionable information that can be used to develop the particular work context. Even with its limitations, this study was an attempt toward a more rigorous approach to TPB and the TACT principle, also demonstrating that TPB is particularly suitable for studying KS in context.

7.1 Research implications

The study suggests that belief elicitation is a feasible approach to understanding predictors of KS. Future studies into KS could establish whether the predictive utility established in the present study (and other fields) is applicable elsewhere or in other KS behaviors. It may even present a way to expose beliefs and reasons underlying knowledge withholding. The procedure from elicited beliefs to measurable survey items benefited from the clear procedure laid out by Francis *et al.* (2004), but it also highlighted the more general challenge with all KS research, namely, that KS is very difficult to operationalize. The elicitation procedures may need to be developed over time to better suit KS, which is rarely

a single behavior but a range of behaviors. When a behavior is presented as a group of behaviors, it becomes burdensome for the respondents to hold the definition in mind while responding to the many questions. In future studies, it could make sense to develop strategies to, e.g., use different samples to elicit beliefs for different specific KS behaviors.

7.2 Managerial implications

For managers, the only KS drivers of interest are typically those that concern their own organization. An elicitation study, when correctly applied, can be an effective, fast and inexpensive way to generate relevant actionable information about the drivers of specific behaviors in their own environment, thereby presenting opportunities to make improvements. Instead of attempting to influence employee beliefs directly, one approach is to develop the work context or conditions that these beliefs concern. The approach also encourages managers to identify forums and behaviors that are particularly important in terms of KS in their own organization. These behaviors and contexts may vary from one organization to the next reflecting the prevailing culture, industry or management style. Identifying the behavioral influencers that prevail in a particular work context, and acting on them rather than a set of assumed influences could be highly effective. If, for instance, concerns over knowledge ownership, or loss of power, are not concerns, as the case in the present study was, they should not guide management action either.

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Appendix 1

Table AI The survey items (in all items "active KS" is defined to mean yi, 2009, KS acts below)

Construct	*Items*	*Source*
Positive attitude		
"What are the advantages of active KS in work meetings?"	If I am active [. . .]	*Elicited*
	new perspectives are brought to the issues at hand	*Elicited*
	I inspire others and the interaction increases	*Elicited*
	I foster knowledge diffusion	*Elicited*
	I activate others and the quality of process improves	*Elicited*
Negative attitude		
"What are the disadvantages of active KS in work meetings?"	If I am active [. . .]	
	the meeting extends which adds to time pressure	*Elicited*
	we may meander to wrong topics	*Elicited*
Subjective norms	My superiors think I should engage in active KS in work meetings	Francis *et al.* (2004)[a]
	My colleagues think I should engage in active KS in work meetings	Francis *et al.* (2004)
	My colleagues engage in active KS in work meetings	Francis *et al.* (2004)
Self-efficacy	Active KS in work meetings is easy for me	Francis *et al.* (2004)
	I can engage in active KS in work meetings whenever I want to	Francis *et al.* (2004)
Knowledge self-efficacy	I am confident in my ability to provide knowledge that others in my organization consider valuable	Spreitzer (1995)
	I have the expertise required to provide valuable knowledge for my organization	Spreitzer (1995)
	It does not really make any difference whether I share my knowledge with colleagues. (reversed)	Spreitzer (1995)
Control beliefs	My active KS in work meetings is not entirely up to me	Francis *et al.* (2004)
	My active KS in work meetings is primarily influenced by things that I cannot myself influence	Francis *et al.* (2004)
Barriers to KS		
"My active KS in work meetings is impeded [. . .]"	If the chair is not up to the job, or does not take the role	*Elicited*
	by poor preparation	*Elicited*
	If some individuals dominate the meeting with long speeches or strong views	*Elicited*
	If the atmosphere is poor	*Elicited*
	If there is a rushed feeling	*Elicited*
	If the opportunities to speak up or address the meeting are divided unequally	*Elicited*
	if there are too many participants	*Elicited*
KS intentions	I intend to engage in active KS in work meetings	Francis *et al.* (2004)
	I expect to engage in active KS in work meetings	Francis *et al.* (2004)
	I want to engage in active KS in work meetings	Francis *et al.* (2004)
Knowledge sharing	I expressed ideas and thoughts in work meetings	Yi (2009)
	I participated fully in idea generation in work meetings	Yi (2009)
	I proposed solutions to problems in work meetings	Yi (2009)
	I answered questions of others in work meetings	Yi (2009)
	I asked questions to elicit others' thinking and discussion in work meetings	Yi (2009)

Note: [a]The measures used by Francis *et al.* (2004) originate from the work of Ajzen and Fishbein, and Bandura

Appendix 2

Table AII EFA on all independent variables; total variance explained 49.5 per cent, loadings of absolute value < 0.3 not included

	Positive attitude	*Negative attitude*	*Subjective norms*	*Efficacy beliefs*	*Control beliefs*	*KS barriers "poor interaction"*	*KS barriers "poor process"*	*Communality*
I inspire others and interaction grows	0.79							0.654
I foster knowledge diffusion	0.70							0.558
I activate others; process quality improves	0.70							0.588
I bring new perspectives to issues at hand	0.62							0.433
Meeting extends; time pressure mounts		0.79						0.687
Meandering to wrong topics		0.67						0.500
My colleagues think I should engage in active KS			0.97					0.999
My superiors think I should engage in active KS			0.76					0.660
My colleagues engage in active KS			0.34					0.202
Based on my expertise I have valuable knowledge [. . .]				0.77				0.610
I'm convinced I have knowledge others value	0.31			0.77				0.706
Active KS is easy for me				0.51				0.443
It makes no difference if I share my knowledge (R)				0.46				0.278
I can engage in active KS whenever I want to				0.41				0.431
My active KS is influenced by things I cannot influence					0.72			0.642
My active KS is not up to me only					0.67			0.290
My active KS is impeded by a strong sense of urgency						0.66		0.460
My active KS is impeded if the atmosphere is poor						0.66		0.500
My active KS is impeded if opportunities to speak or address the meetings are unequally divided						0.55		0.350
My active KS is impeded by too many participants						0.41		0.213
My active KS is impeded if some dominate [. . .]						0.48	0.31	0.431
My active KS is impeded by poor preparation							0.59	0.388
My active KS is impeded if chair is not up to the job							0.57	0.352

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