

Knowledge Sharing Behavior and Cognitive Dissonance: The Influence of Assertive Conflict Management Strategy and Team Psychological Safety

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Abstract—Today's workers face more numerous and complex challenges and are required to be increasingly interdependent and faster learners. Knowledge sharing activities between people have been understood as a significant element affecting organizational innovation performance. While they do have the potential to spark cognitive conflict, disagreement is important from an organizational perspective because it can stimulate the development of new ideas and perhaps pave the way for creativity, innovation, and competitive advantage. How teams cope with the cognitive conflict dimension of knowledge sharing and the associated interpersonal risk is what captures our attention. Specifically, assertive conflict management strategies have a positive influence on knowledge sharing behaviors, and team psychological safety has a positive influence on knowledge sharing intention. This paper focuses on explaining the impact that these factors have on the shaping of an individual's decision to engage or not in knowledge sharing activities. To accomplish this, we performed an empirical analysis on the results of our questionnaire about knowledge-sharing related conflict management and team psychological safety in pharmaceutical enterprises located in North America, Europe, and Asia. First, univariate analysis is used to characterize behavior regarding conflict management strategy into two groups. Group 1 presents assertive conflict management strategies and group 2 shows unassertive ones. Then, by using SEM methodology, we evaluated the relationships between them and the team psychological safety construct with the knowledge sharing process. The results of the SEM analysis show that assertive conflict management strategies affect the knowledge sharing process the most with a small, but significant effect from team psychological safety. The findings suggest that assertive conflict management strategies are just as important as knowledge sharing intentions for encouraging knowledge sharing behavior. This paper provides clear insights into how employees manage the sharing of their knowledge in the face of conflict and interpersonal risk and the relative importance of these factors in sustaining productive knowledge sharing activities.

Keywords—Cognitive dissonance, conflict management, knowledge sharing, organizational behavior, psychological safety.

I. INTRODUCTION

THE rise of knowledge as the main driver of the new world economy is in full-force. However, organizations that lack the ability to exploit their creative potential will undoubtedly fall behind their competitors. In a work context, knowledge sharing permits colleagues the opportunity to learn about one another's experiences and beliefs usually for problem solving

and/or decision making with the natural risk to have perceived differences in cognition and subsequent periods of conflict. Cognitive dissonance is important from an organizational perspective because disagreement likely facilitates the creation of new ideas which then contribute to creativity, innovation and the ultimate competitive advantage of the firm.

This paper offers an empirical investigation of the effect of team psychological safety (TPS) and assertive cognitive conflict management strategy (aCMS) on workforce knowledge sharing behavior. Its purpose is to provide a better understanding of the role that these variables play in knowledge sharing behavior, how positive knowledge sharing behavior can be encouraged and sustained and provide clues as to why even the most positive knowledge sharing attitudes and intentions do not always translate into positive knowledge sharing behaviors. In an effort to enrich the literature and perhaps spark further interest, this paper shares our experience of evaluating the roles of TPS and aCMS within the context of knowledge sharing by work teams of several multinational pharmaceutical companies located primarily in North America, France and Thailand.

II. LITERATURE REVIEW

The literature indicates the vital importance of knowledge and knowledge sharing as a critical organizational resource that provides a sustainable competitive advantage [1]-[5]. Furthermore, the literature shows an existence of many motivational factors of knowledge sharing that can be easily organized into two major classes: environmental motivators and personal motivators, with several sub-factors in each class that may affect one another. For an individual to be inspired to perform a certain behavior, they require various motivators from their environment and from within themselves that either drives them or stops them from performing the behavior. Knowledge sharing is a dynamic process involving continuous reflection on multiple environmental and personal motivators which work to shape and re-shape intention and behavior. Previous empirical research shows that trust, organizational climate and evaluation apprehension are the most critical, environmentally-derived positive influencers of knowledge sharing [1], [6]-[14].

Frequent collaboration in organizational settings always harbors a risk for conflict. The complexity and interdependence of organizational life is one of the main reasons for episodes of conflict between employees from time to time and organizations are increasingly moving to team-

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based structures in response to ever higher demands for efficiency and flexibility [15], [16]. Knowledge sharing is a common team activity that can involve intense discussion of differing beliefs which may trigger conflict. As soon as individuals communicate freely with one another, disagreement is bound to occur and the problem is not the occurrence of conflict, but rather the spontaneous sense-making executed by each actor [17].

We identified TPS and conflict management strategy as the constructs which best incorporate the most popular environmental and personal influencing factors on knowledge sharing. TPS is a learning-oriented type of interpersonal climate characterized by a collective belief that a team is safe for interpersonal risk taking such as expressing their ideas, asking questions, and bringing up concerns early and often [18]. It is important to note that several studies were unable to identify any significant relationship between extrinsic motivation and knowledge sharing intentions or attitudes toward knowledge sharing [19]-[21] with their negative findings suggesting that a positive work climate alone may not be enough to facilitate knowledge sharing.

Conflict management is the general and consistent orientation that individuals and teams use to handle interpersonal conflicts [22], [23]. The five most common conflict management strategies are manifested through five related behaviors with each having an associated level of assertiveness: avoiding, accommodating, compromising, controlling, and collaborating [24]. These principles are linked to our research where individuals use the same strategies when dealing with the conflict dimension of knowledge sharing.

The positive relationships between knowledge sharing attitude, knowledge sharing intention and knowledge sharing behavior are well documented in the literature [1] with few studies investigating the impact of conflict management on knowledge sharing [25] and no studies investigating the collective effect of TPS and conflict management strategy on knowledge sharing.

III. RESEARCH MODEL AND HYPOTHESIS DEVELOPMENT

A. Theory of Reasoned Action and Team Learning

This research follows the principles outlined in the Theory of Reasoned Action (TRA), where the beliefs and attitudes of individuals can explain most human behaviors and that behavior is controlled by the intention to produce the behavior [26]. Two major factors such as a personal or "attitudinal" factor and a social or "normative" factor influence behavioral intention. The first factor involves a person's feelings toward a specific behavior and is a function of the relevant behavioral beliefs about the perceived consequences of performing the behavior and the person's outcome evaluation of the consequences [26]. The second factor deals with an individual's perceived social pressure to perform or not perform a specific behavior [27]; however, the pressure's weight is in terms of how they value each of the others' opinions and the motivation to comply with them [26]. Behavioral intention is a "blueprint" for action which is

influenced by an individual's attitudes toward the behavior and the subjective norm for performing the behavior.

Modern organizational objectives are increasingly harder for individuals to accomplish on their own requiring team learning to facilitate problem solving, decision making, process improvements, and innovation. Knowledge sharing is a type of learning behavior characterized by group interaction activities where individuals acquire, share and combine knowledge [28]. Likewise, one would expect that a learning-oriented climate also encourages knowledge sharing; however, mixed empirical results have been found [29]-[32].

B. Research Conceptual Model and Hypotheses

Hypothesis and model development follows the principles outlined in the Theory of Reasoned Action incorporating the constructs of TPS and conflict management strategy. To the authors' knowledge, no study has yet to investigate the collective effects of TPS and conflict management strategy on knowledge sharing behavior. Empirical research has partially investigated this however there remain some gray areas in understanding the relationships involved, especially when including the conflict component.

Please remember that behavioral intention is determined by personal and environmental incentives. Here, TPS represents the environmental component which includes the combined effects of organizational climate, evaluation apprehension and trust. Even though these phenomena are individually perceived, the experience comes from the environment. Construction of our conceptual model begins with the TRA-based core including attitude towards knowledge sharing followed by TPS with both having a direct effect on knowledge sharing intention that then has a direct effect on knowledge sharing behavior. The model is finalized by the addition of the second personal incentive of conflict management strategy.

TPS is significantly and positively related to learning behavior in organizational work teams [33]. Furthermore, an organizational climate conducive to knowledge sharing exerts a strong influence on the formation of subjective norms and directly affects individuals' intentions to participate in knowledge sharing behaviors [27].

H1. Team psychological safety (TPS) is positively associated with knowledge sharing intention.

According to Theory of Reasoned Action (TRA), the attitude towards a behavior has a direct effect on the intention of performing it which then has a direct effect on the actual behavior. Bock and Kim [34] noted that knowledge sharing intention serves as an immediate predictor of knowledge sharing behavior. This paper does not explore these relationships in great detail as the literature sufficiently documents the phenomena. Rather, the authors include them as a way to form a more comprehensive TRA-based research model and provide additional support for their associations.

H2. Attitude towards knowledge sharing (KSA) is positively associated with knowledge sharing intention.

H3. Knowledge sharing intention (KSI) is positively associated with knowledge sharing behavior.

We assume that most working professionals have an idea of what knowledge sharing is and that it includes the possibility of cognitive conflict creating a need for management of it. This need activates the selection of a conflict management strategy and related level of assertiveness which then affects a person's knowledge sharing behavior. We are interested in how conflict management strategy and its related characteristic of assertiveness relate to knowledge sharing behavior. The identification of study participant conflict management strategy suggests if they are generally assertive or not when managing conflict and how it affects their knowledge sharing behavior.

Studies have argued that conflict management strategies are both group and individual characteristics and that a person's overall situation depends on both external conditions and their approach to people and problems [23], [35]. This suggests that the problem of cognitive conflict within knowledge sharing activities is not just a function of the external environment, but also that of a separate conflict management strategy that people bring in to handle the situation. Furthermore, the impact of conflict management strategies is much broader than just affecting the quality of agreement during negotiations and resolution of conflict with personal reasons to engage or not in a certain behavior remaining more powerful than extrinsic ones [36]. Likewise, we conclude that conflict management strategies may serve as a "final say" in governing knowledge sharing behavior and could help to explain at least partially why sometimes knowledge is not shared in spite of positive attitudes, positive intentions and positive TPS. Even though unassertive conflict management strategies (uCMS) probably have a negative impact on knowledge sharing behavior, for practical reasons we limit our focus on assertive strategies. H4. Assertive conflict management strategy (aCMS) is positively associated with knowledge sharing behavior.

Fig. 1 represents our research conceptual model based on the reviews of the literature and the relationships between the major social and personal issues revealed as a consequence. Therefore, this research argues that assertive conflict management strategy and TPS have a positive impact on knowledge sharing in work teams.

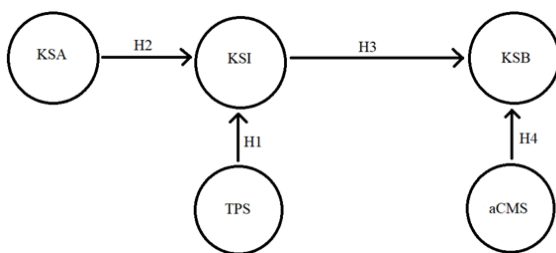


Fig. 1 Research Conceptual Model

IV. RESEARCH METHODOLOGY

A quantitative approach was used to investigate the relationships between knowledge sharing attitude, TPS, knowledge sharing intention, assertive conflict management strategy and knowledge sharing behavior. Data were collected

using a structured survey questionnaire presented to pharmaceutical research and development (R&D) employees to rate their perceptions of TPS, conflict management strategy and engagement in knowledge sharing. The pharmaceutical sector was chosen primarily because R&D professionals are typically considered pioneers of innovation, but also due to the primary researcher's work experience and professional contacts within the industry.

Our structured survey was assembled using previously validated empirical statements with minimal changes permitted to question wording to allow for context. Measurement items for KSA [27], KSI [20], [27] and [41], KSB [41], TPS [33] and CMS [42] were all sourced from the referenced studies. Exhaustive response categories were constructed using a six-point Likert-type scale ranging from "strongly disagree" to "strongly agree".

A pilot study was conducted over the course of five weeks at a subsidiary of a large, multinational pharmaceutical company located in Bangkok, Thailand. Even though random sampling is preferred, simple and cost-effective convenience sampling was performed since it overcomes the difficulty of obtaining a random sample and high number of employee responses by selecting the most accessible subjects. As feared, the pilot study raised questions requiring some adjustments to the target population and to the survey itself. For example, even with a response rate of 27%, the study yielded only 13 completed surveys. Furthermore, the statements relating to the conflict management strategies were given context at the beginning and the definitions for "team" and "conflicting ideas" were clarified and unnecessary demographics questions were eliminated. Perhaps the biggest change was moving from a paper survey to an electronic, online format while using SurveyMonkey® as the execution tool. The final research instrument consisted of 50 statements with the hyperlink distributed to employees in one R&D department at the same pharmaceutical company however at a different branch located in the New York Metropolitan Area of the United States. Data collection occurred over a period of several months with a response rate of 30%.

Unfortunately, focusing on collecting enough data from the R&D function of a single particular pharmaceutical company proved infeasible, as only 34 completed surveys were collected forcing the expansion of the population of interest to R&D departments at several different pharmaceutical companies. Due to the primary researcher's physical location in France, a French version of the survey was created and distributed with the English version first to the main researcher's personal, professional contacts and then posting the two versions of the survey into pharmaceutical R&D-specific, closed groups on the professional social network LinkedIn. This phase of data collection occurred over a period of five months with periodic re-posting of the original recruitment post in the chosen groups. For statistical purposes, the minimum number of respondents was set at 100 however due to time constraints the data collection was halted when 140 completed surveys were obtained. Finally, the data were complemented by descriptive and inferential statistical

methods using SPSS® and Amos™ SEM for evaluation of the model as a whole.

V. FINDINGS

The paper offers empirical insights about how team psychological safety (TPS) and assertive conflict management strategy (aCMS) effect employee engagement in knowledge sharing. Structural equation modeling (SEM) was used in this research to investigate the hypothesized relationships between knowledge sharing attitude (KSA), knowledge sharing intention (KSI), TPS, aCMS and knowledge sharing behavior (KSB). First, the model reliability is assessed and is followed by an evaluation of the hypothetical relationships with the unobserved variables and a specification of the uni-directional and bi-directional direct relationships between them.

A. Statistical Analyses

Our research produced results consistent with existing research however, the incorporation of the additional two variables and subsequent SEM analyses provide insights never before seen. Table I shows that the measures used in this research demonstrate internal reliability for pharmaceutical R&D employees and are consistent with those found in the literature. Additionally, it was determined that data collected was approximately normally distributed and free of extreme contamination, thus making it suitable for statistical manipulation.

Variable	n	Cronbach's α	Number of Items
KSI	139	0.961	5
KSA	140	0.952	5
KSB	138	0.904	5
TPS	139	0.954	7
aCMS	109	0.938	16
uCMS	31	0.949	12

Note: n = the number of samples from the population

Statistical analysis revealed an over-identified research model with 3 degrees of freedom, an acceptably small chi-square value (3.854) and an insignificant probability value of (0.278). Descriptive statistics and simultaneous multivariate analyses of structural equation modeling (SEM) with SPSS® and AMOS™ v.22 software was used to test the hypothesized relationships. The frequency analyses indicates that more than half of our study participants felt psychologically safe within their team (68.6%, n=96), use mostly assertive conflict management strategies (77.9%, n=109), have positive knowledge sharing attitudes (82.9%, n=116), positive knowledge sharing intentions (82.9%, n=116) and have engaged in positive knowledge sharing behaviors (87.9%, n=123). Our empirical structural equation model, as shown in Fig. 2, clearly shows the variable relations, effect sizes and significance levels ($\alpha = 0.05$). Study participants who identified with unassertive conflict management strategy (uCMS) were used as an internal control as a dummy variable while running the SEM. Hypotheses were tested using the

traditional null hypothesis approach.

High quality SEM research cannot be ensured by any single measure of fit or any specific set of measures of model fit. While differences in agreement exist, the following represents the most widely used collection of indices: root mean square residual (RMR), comparative fit index (CFI), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), parsimony normed fit index (PNFI) and root mean square error of approximation (RMSEA). These indices are preferred since they are the most insensitive to sample size, model misspecification and parameter estimates. The results shown in Table II indicate that the data acceptably fit the SEM empirical model.

TABLE II
RESULTS OF SEM MODEL FIT INDICES

Model Fit Index	Default Model	Saturated Model	Independence Model
RMR	0.018	0.000	0.515
CFI	0.997	1.000	0.000
GFI	0.989	1.000	0.469
AGFI	0.947	---	0.204
PNFI	0.297	0.000	0.000
RMSEA	0.045	---	0.494

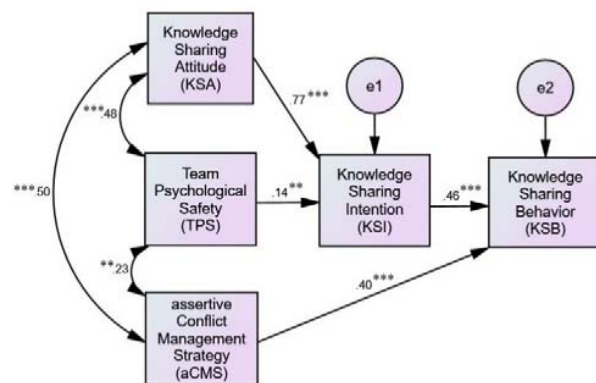


Fig. 2 Empirical structural equation model (SEM) Note: $p^{**} < 0.01$, $p^{***} < 0.001$

While the results are not presented here, the researchers thought it could be interesting to run a one-way ANOVA to evaluate if team size had any influence or relationship with any of the studied variables. For example, it could be logically expected that in teams with a larger number of members, psychological safety scores could be lower than those of smaller teams. Unfortunately, not enough evidence was found to support the claim that team size has an influence on any other of our variable(s) and is in fact, independent of them. In addition, the researchers ran independent samples t-test to compare participant knowledge sharing behavior in assertive and unassertive conflict management strategy conditions. A significant difference was noted in the scores for assertive ($M = 5.03$, $SD = 0.74$) and unassertive conflict management strategy ($M = 3.63$, $SD = 1.35$) conditions; $t(37) = 6.50$, $p = \leq 0.001$

B. Hypotheses Testing

Proposed hypotheses were tested using the traditional null hypothesis approach. Following the results of the AMOS reports for the SEM, the structural model fit the data as all fit indices fall within the recommended criteria. Table III shows that TPS and knowledge sharing attitude (KSA) have a positive influence on knowledge sharing intention (KSI) with path coefficients of 0.142 and 0.771, respectively, as predicted in hypothesis H1 and hypothesis H2. Furthermore, the results show that knowledge sharing intention (KSI) and assertive conflict management strategy (aCMS) have a positive impact on knowledge sharing behavior (KSB) with path coefficients of 0.463 and 0.400, respectively, as predicted in hypothesis H3 and hypothesis H4.

TABLE III
RESULTS FOR THE DIRECT EFFECTS IN THE MODEL

Hypothesis	Hypothesis path	Path coefficient	Results
H1	TPS → KSI	0.142**	Supported
H2	KSA → KSI	0.771***	Supported
H3	KSI → KSB	0.463***	Supported
H4	aCMS → KSB	0.400***	Supported

Note: p**<0.01, p***<0.001

VI. DISCUSSION AND CONCLUSIONS

The SEM results indicated good support for the proposed relationships. The findings indicate that, in the case of pharmaceutical R&D work teams, TPS has a positive, statistically significant impact on knowledge sharing intention and assertive conflict management strategy has a positive, statistically significant influence on knowledge sharing behavior. The important impact of assertive conflict management strategies is supported by the results of the independent t-test. Environments supporting the development of positive knowledge sharing attitude and intention and pharmaceutical R&D workers who associate more with an assertive conflict management strategy contribute more to positive knowledge sharing behavior.

The standardized weights are in most cases greater than or equal to 0.400; however, the variables are sufficiently significant to justify leaving all of them in the model. The finding that immediately grabs our attention is the significant explanation of variance in knowledge sharing attitude, intention, and behavior, as shown in our empirical SEM. For example, significantly 98% of variance in knowledge sharing attitude, 91% of variance in knowledge sharing intention, and 86% of variance in knowledge sharing behavior is explained by the constructs.

The critical role of TPS is also demonstrated by the significant standardized weights of the relationships impacting three out of the model's five variables. Furthermore, the overall complexity of the SEM model reflects the overall complexity of the knowledge sharing process.

While a collaborative conflict management strategy was identified as the most dominant strategy (63%, n=88), it is necessary to note that the initial distribution (281) was more than the number of participants (n=140) indicating response

overlap as some participants identified with more than one general strategy. Respondents could have considered the following when responding to the questionnaire: accommodating behaviors are cooperative and could be used when collaborating with others; who were involved in the conflict, the issue at hand, and even multiple conflict events. Fortunately, after minor re-adjustment of the distribution, one dominant strategy was revealed for each participant.

Using an alpha level of 0.05, our t-test evaluated whether the average engagement in knowledge sharing behaviors differs significantly as a function of whether participants are characterized as displaying assertive or unassertive conflict management strategies. The results indicate a significant difference in the mean knowledge sharing behavior of the two groups, and just by looking at them, we can see a huge gap. This supports the claim that overall, the two groups probably do not behave the same way and probably do not have the same impact on knowledge sharing behavior. Furthermore, there is likely a good influence of conflict management strategy on knowledge sharing behavior or that knowledge sharing behavior is dependent on conflict management strategy. As the mean values indicate, the assertive group (M = 5.028) engaged more significantly in knowledge sharing behaviors than the unassertive group (M = 3.626). This could be expected as the two groups' behaviors are opposite in nature. Finally, the results suggest that a difference in the mean score of knowledge sharing behavior is found because of the influence of conflict management strategy.

Based on the foregoing, it is concluded that pharmaceutical R&D employees who address cognitive conflict with more assertive strategies contribute more to positive knowledge sharing behavior, whether the organizational climate encourages it or not. This suggests that they may also be more likely involved with knowledge creation, creativity and innovation.

To conclude, this work makes new contributions and extends the literature on patterns of behavior with regard to cognitive dissonance in a knowledge sharing context. In addition, the study provides further proof of the positive effect of knowledge management and the necessity of having a good understanding of the antecedents of knowledge sharing behavior.

VII. LIMITATIONS AND FUTURE DIRECTIONS

While the results of the work are very encouraging, every study has its limitations. For example, the findings cannot be applied to the general, pharmaceutical R&D population due to the chosen sampling technique. In addition, use of the classical null hypothesis approach is frowned upon and incorrect interpretation of *p*-values with respect to dichotomous significance testing and sample size. In our case, we determined that our sample size is not large enough to consider these warnings and believe that our observed effects occurred not by chance, but through a real relationship between the variables. Furthermore, even when statistical significance is achieved, it provides no guarantee that a result is real. Some proportion of false positives (Type I error) that

arise from sampling error is unavoidable. The best way to determine if a result is real is by replicating the experiment at different times and in different settings and then performing a meta-analysis to compare results for similarity.

Despite the limitations, this study represents a first step into investigating the relationship between psychological safety and conflict management strategy with knowledge sharing. This mandates a need to replicate our findings. As such, we strongly encourage others to examine our findings through more rigorous research designs and with other organizations outside of the pharmaceutical industry.

An individual's conflict management strategy is most likely not the same when dealing with cognitive disagreement between everyone or in every context and even has the ability to be switched during the course of the knowledge sharing process. As problems are discussed and decisions are forming, each person involved argues their case in an attempt to persuade others to validate their point of view. People are also able to learn from others' points of view and adapt to changing situations as the knowledge sharing process evolves by adjusting their attitude accordingly. For example, a new belief can be added in the form of new knowledge, a belief's valuation can be changed by convincing others to accept or reject knowledge or a belief's strength can be altered by providing more or less supporting evidence. Future more, qualitative, longitudinal studies may be able to capture this.

The above was demonstrated in our study as some participants agreed with more than one conflict management strategy. This could be partially explained by the probability that participants' considered one or more of the above circumstances and even an unclear presentation of the survey statements. In future studies, the survey instrument should include more specific questions and/or be designed differently to clearly capture the dominant strategy used most of the time for each participant. It may also prove interesting to investigate the separate influence of each conflict management strategy on knowledge sharing behavior.

On a final note, it could be useful to investigate if there is a link from our model to the process of strategic decision making and/or team creativity/innovation outcomes. Previous research has demonstrated that knowledge sharing has a positive effect on the decision-making process and that "cognitive conflict surrounding appropriate paths of action is essential for effective strategic choice" optimal decision choices can be made when unique information is shared between group members [37]-[40].

In the least, the authors hope to provide a comprehensive tool to evaluate workforce engagement in knowledge sharing when confronted with cognitive dissonance.

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