The Effects of Competition and Time Constraints on Knowledge Transfer: Exploratory Findings from Two Experiments

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Abstract

This paper presents two experiments that examine the possible effects of competition (individual and team), and time constraints on knowledge hiding and knowledge sharing. Results suggest that competition plays a stronger role in knowledge sharing behaviors, but less of a role in knowledge hiding behaviors, while time, although a common excuse for not sharing, is not associated with knowledge hiding or sharing behaviors. Implications for research and practice are discussed.

1. Introduction

Despite the introduction of specialized information systems designed to facilitate knowledge transfer among colleagues, many organizations continue to struggle in their efforts to increase knowledge sharing among their employees [e.g., 1, 2, 3]. It is generally recognized that an increase in knowledge sharing among employees will make them more productive and enhance the overall performance of the organization [e.g., 4, 5-8]. However, knowledge sharing is difficult to implement in organizations.

Thus far, the emphasis in much of the research on knowledge transfer in organizations has focused on how workers’ attitudes and behaviors contribute to knowledge sharing in organizations [e.g., 1, 9, 10, 11] or situational factors such as organizational culture and management support [e.g., 12, 13]. However, there has been little regard for some of the practical issues that may prevent an individual from sharing knowledge with another worker. These practical considerations are important, because even when there is an efficient knowledge sharing infrastructure in place (e.g., a knowledge management system), employees may still consider a range of situational factors before they decide to willingly use the infrastructure and transfer their knowledge to others in the organization.

This paper considers two important situational variables that may affect individuals’ knowledge transfer behaviors: the amount of competition at the individual and team levels, and the amount of time constraints. We also build upon the work of Webster et al. [14] by considering a broader spectrum of knowledge transfer behaviors; we consider both knowledge sharing and knowledge hiding at the dyadic level. To do this, we conducted two independent simple experiments to test for main effects with these factors (time and competition). The findings of this paper may help organizations to design better knowledge sharing infrastructure, and allow organizations to design more effective knowledge management policies and practices.

2. Background and Theory

2.1 Knowledge Transfer among Coworkers

In recent years we have seen a dramatic increase in the number of academic and practitioner articles about the transfer of knowledge between employees in organizational settings. In this paper, we focus on knowledge transfer at the dyadic level, between individuals. We have chosen this perspective to be consistent with prior research [15, 16], and because these requests are the main ways in which tacit knowledge is shared in organizations [17, 18].

Knowledge transfer encompasses two separate yet related behaviors, knowledge sharing and knowledge hiding. Knowledge sharing refers to a set of behaviors in which an individual provides assistance by imparting his or her expertise, insight or understanding to a recipient; this includes either tacit or explicit knowledge [19-21]. In contrast, knowledge hiding is an intentional attempt to withhold or conceal knowledge that has been requested by another individual [22]. That is, it captures dyadic situations in which knowledge is requested by one employee and that knowledge is hidden by another employee [14]. Although one might expect that knowledge sharing and hiding are opposite ends of a single spectrum of behavior, there is recent evidence that these behaviors are in fact moderately negatively correlated [22]. In a qualitative study, Ford and Staples [23] found that knowledge sharing and hiding behaviors mapped more meaningfully along a 2x2 dimension than a single behavioral continuum and they proposed that the resulting behaviors (full knowledge sharing, partial knowledge sharing, knowledge hiding and

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disengagement) would have separate predictors. In a recent qualitative study, Ford [24] confirmed that there were different predictors for the different knowledge sharing, hiding and disengagement behaviors. Indeed, Connelly, et al. [22] suggest that it is important to consider both types of behaviors in order to deepen our understanding of the reasons why individuals transfer their knowledge to their coworkers, or keep important information to themselves. In their study, they found both qualitative and quantitative support that knowledge sharing and knowledge hiding are distinct behaviors with separate predictors and outcomes [25].

3. Experiment 1: The Effect of Competition on Knowledge Transfer

Competition among employees for scarce resources has been established as a possible barrier to knowledge sharing in organizations [25]. Simply put, employees who are competing against each other may be less likely to provide assistance to rivals. Indeed, Ford and Staples [23] illustrated a case in which an individual intentionally withheld knowledge from peers with whom competition for promotion existed, although he would openly share knowledge with individuals who were junior in status, and who therefore did not represent a threat.

In contrast, competition against other teams has been shown to be associated with benefits for the individuals within the team, such as information sharing [26]. Because individuals may behave differently towards fellow team-members and rivals, we distinguish three experimental conditions in first experiment: no competition, team competition (whereby a team of two individuals compete against other teams), and individual competition (each individual competes against all others).

In the case of team competition, we expect all team members to anticipate a range of intrinsic (e.g., recognition, achievement) and extrinsic (e.g., financial rewards) benefits for all individuals within a winning team, and thus engage in knowledge sharing while refraining from knowledge hiding. Simply put, it is in their best interest to optimize their knowledge transfer behaviors such that their team outperforms other teams.

In the no-competition condition, we expect that individuals will only consider intrinsic benefits (i.e., there are no extrinsic rewards available). Thus, these participants are more likely to engage in knowledge sharing, and avoid knowledge hiding, but to a lesser extent than those in the team competition condition.

In contrast to the abovementioned scenarios, in an individual competition setting, participants would consider both intrinsic and extrinsic benefits. Thus, they may feel that they need to outperform their teammates in order to enhance satisfaction with self (intrinsic) and to win the financial reward (extrinsic). Low levels of knowledge sharing and high levels of knowledge hiding can help individuals obtain these benefits. We therefore suggest the following hypotheses:

Hypothesis 1: Competition will influence knowledge sharing, such that individuals in the team competition condition will exhibit more knowledge sharing than individuals in the no competition condition, and people in the individual competition condition will exhibit less knowledge sharing than those in the no competition condition.

Hypothesis 2: Competition will influence knowledge hiding, such that people in the individual competition condition will exhibit more knowledge hiding than people in the no competition condition, and individuals in the team competition condition will exhibit less knowledge hiding than those in the no competition condition.

3.1 Method

Much of the existing research on knowledge transfer uses self-report surveys or qualitative interviews. Despite the strengths of these different methods, our goal was to directly examine the influence of competition on knowledge transfer behaviors. Because this can be manipulated directly, we chose to use an experiment. This method is appropriate as it would allow us to make conclusions regarding a causal relationship between competition and knowledge sharing and hiding, provided extraneous variables are controlled.

The first experiment, involved 152 second-year undergraduate business students in a communications course. The response rate was 91% as not all students submitted completed, usable surveys, yielding a sample of 138 participants. Business students were selected for this experiment because they are expected to present behaviors that are typical of junior management. The final sample included 48 women (35%) and 90 men (65%). Most respondents were not working at the time of the experiment (68%); however, many had previous full-time and part-time work experience. Participant part-time experience ranged from none to eight years with a mean experience of about two and a half years. Their full-time working experience ranged from none to five years, with a mean of about six months.

This research used a student population for which part of the experimental task was a mandatory class assignment. Nevertheless, the students’ completion of
the post-experiment survey was voluntary. The survey completion was encouraged with small monetary incentives. The task and the post-task survey were paper and pencil based.

The exercise was presented to the participants as a managerial aptitude assessment. They were asked to solve a series of multiple-choice GMAT-style math problems individually. The reasons for choosing these types of math problems were because participants were expected to be familiar with them, and it was believed they could be used as the basis for knowledge sharing and hiding behaviors for the participants. Attention was given to the selection of the math problems such that they were not too easy and could be completed in a 15 minute timeframe. A preliminary set of 20 GMAT questions was given to several PhD students, with a GMAT formula sheet. Based on their solutions, timing, and recommendations, a set of six questions was selected for this exercise. This set of questions was then tested with another group of PhD students to ensure it was solvable in the defined timeframe (20 minutes for all conditions). The final task was comprised of six GMAT questions and a formula sheet. Participants were given a copy of the relevant instructions as per their experimental condition group and the exercise. They were also randomly assigned into teams of two (dyads) as they entered the class. The instructions were read to the participants, after which they began working on the task.

In the instructions, individuals were told that they must ask their counterparts one (and only one) written question. They were further told that the question should pertain to something in the exercise they do not know, are not sure about, or would like to get a second opinion on. For this, they were asked to use an enclosed “question and answer” sheet that contained question and answer areas. Participants were told that (1) their counterpart is not under any obligation to answer their question, and (2) communicating with their counterpart, using the Q&A sheet, is not considered cheating in this exercise. They were further instructed that they may (but are not required to) answer their counterparts’ questions and use the enclosed formula sheet. Other materials, such as calculators, that were not enclosed in the exercise handouts were not allowed. Verbal communications were also forbidden.

Paper and pen communication was chosen because the experimental setting was not conducive to electronic communications due to the unavailability of sufficient computers. Further, verbal communications could confound the experimental condition by introducing noise to the other participants (i.e., impact ability to concentrate thus potentially impacting perceived time pressure) and noise level would not be controllable or consistent necessarily across the experimental conditions.

After completing the exercise, participants were given copies of the survey. Completed exercises and surveys were put in envelopes and handed to the researchers. Students where then debriefed on the study, the manipulations, and the expected outcomes.

The survey instrument had two parts. The first part included items (in the following order) for the assessment of: (1) the dependent variables (knowledge sharing, and knowledge hiding), (2) manipulation check measures (perceived competition, and control variables (math self-efficacy, trait competitiveness, and perceived time pressure). These items used a one to seven Likert scale, anchored with “strongly disagree” (1) and “strongly agree” (7). The second part solicited demographic information such as age, sex, and work experience.

The survey was given to students and academics for review prior to the experiment. As a result, several minor changes were made. The measures included in the first part, their sources and sample items are outlined in Table 1. The measures’ reliability were acceptable for this study (see Table 1), and the discriminant validity was tested with a factor analysis using Direct Oblimin Rotation in SPSS. The measures’ items loaded on their respective factors ($\chi^2 = 651.766, df = 455, p<.001$). Due to space limitations, the loadings for the items are not reported here and are available from the authors upon request.

There were three experimental conditions based on the manipulation of competition: No Competition (n=61), Individual-based Competition (n=34), Team-based Competition (n=43). The situational competitiveness was manipulated via the rewards system, with iPod Nanos as prizes. The No Competition group was told that they would receive prizes for their participation, based on a random draw, regardless of their scores on the task. The Individual Competition group was told that all prizes would be based on their individual score on the task. Finally, the Team-Based Competition group was told that prizes would be allocated based on aggregated team performance. Classes were randomly assigned to the conditions, which is why the three conditions are not equal in size. Thus, while individual assignment was not random as students chose the class for which they registered, the classes themselves were randomly assigned.

Since assignment to conditions was not completely random at the individual level, we tested for differences; as such, a multivariate analysis of variance (MANOVA) was conducted. For this, a full factorial MANOVA model with experiment condition as the fixed factor, and full-time and part-time working experience, trait
competitiveness, and math self efficacy items as the dependent variables was defined. A $p$-value for Wilk’s Lambda of 0.22 reveals that there are no omnibus differences among the treatment groups, in terms of the population attributes. Thus, we may assume the assignment of individuals to the different conditions was sufficiently random to control for possible individual differences.

3.2 Results

The competition manipulation was checked using the perceived competition measure [26]. It was expected that individuals in competition conditions (i.e., team and individual competition groups) would report higher perceived levels of competition than the no competition group. The results demonstrated a significant difference in perceived competition level ($F(2, 136) = 23.402, p < .001$). The no competition group (mean = 2.823, s.d. = 1.605) was significantly lower than individual competition (mean = 4.691, s.d. = 1.422; $p < .001$) and team competition (mean = 4.611, s.d. = 1.607; $p < .001$). There was no significant difference between team and individual competition groups ($p = .822$). Thus, these two groups only differed in terms of the targets of the competition, not the level of competition.

To test Hypotheses 1 and 2, a regression analysis was conducted using experimental condition as a dummy variable, and control variables (sex, age, trait competitiveness and math self-efficacy) included for each of the dependent variables. (See Table 2 for the descriptive measures for the four dependent variables for the three experimental conditions.)

### Table 1. Constructs and Measures

<table>
<thead>
<tr>
<th>Construct (source)</th>
<th># of Items</th>
<th>Alpha</th>
<th>Sample Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Sharing [27]</td>
<td>5</td>
<td>.793</td>
<td>Told my counterpart everything s/he needed to know.</td>
</tr>
<tr>
<td>Knowledge Hiding [27]</td>
<td>11</td>
<td>.844</td>
<td>- When my partner asked me the question, I pretended that I didn’t know the information. [Playing dumb dimension.] - When my partner asked me the question, I offered him/her some other information instead of what he/she really needed. [Evasive hiding dimension.] - When my partner asked me the question, I said that I was too busy to answer. [Rational hiding dimension.]</td>
</tr>
<tr>
<td>Math Self Efficacy [28]</td>
<td>8</td>
<td>.907</td>
<td>A similar set of math problems is well within the scope of my abilities.</td>
</tr>
<tr>
<td>Trait Competitiveness [29]</td>
<td>4</td>
<td>.853</td>
<td>It is important to me to perform better than others on a task.</td>
</tr>
<tr>
<td>Perceived Competition [26]</td>
<td>4</td>
<td>.921</td>
<td>Students were aggressively trying to outperform others during the exercise.</td>
</tr>
<tr>
<td>Perceived Time Pressure [30]</td>
<td>5</td>
<td>.899</td>
<td>I found myself pressed for time when I solved the problems.</td>
</tr>
</tbody>
</table>

### Table 2. Descriptive Statistics for Experiment 1

<table>
<thead>
<tr>
<th>Experimental Condition</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Sharing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Competition</td>
<td>62</td>
<td>4.43</td>
<td>1.32</td>
</tr>
<tr>
<td>Individual Comp.</td>
<td>34</td>
<td>4.59</td>
<td>1.41</td>
</tr>
<tr>
<td>Team Competition</td>
<td>43</td>
<td>5.02</td>
<td>1.24</td>
</tr>
<tr>
<td>Knowledge Hiding</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Competition</td>
<td>62</td>
<td>1.23</td>
<td>0.55</td>
</tr>
<tr>
<td>Individual Comp.</td>
<td>34</td>
<td>1.23</td>
<td>0.48</td>
</tr>
<tr>
<td>Team Competition</td>
<td>43</td>
<td>1.17</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Both of the regressions were significant: knowledge sharing ($F_{(5, 133)} = 2.311, p < .05$, $R^2 = .080$), knowledge hiding ($F_{(5, 132)} = 5.028, p < .001$, $R^2 = .160$). When the significant regressions were examined, however, only knowledge sharing approached significance for the experiment condition ($B = .155, p = .069$). In other words, team competition was associated with higher knowledge sharing than no competition. All of the other control variables were non-significant. For knowledge hiding, the experimental condition was non-significant. However, trait competitiveness was significant ($B = .166, p < .05$) as was age ($B = .337, p < .001$). In other words, as trait competitiveness increased for the participants, knowledge hiding decreased, independent of experimental condition. Further, as age increased, so too did knowledge hiding, independent of experimental condition. An important issue to note with the age finding was the small age range of the participants in this experiment (17-25 years of age), thus this regression should not be extrapolated to individuals older than 25 (or younger than 17).

An additional analysis without the control variables was conducted to further test the hypotheses. An ANOVA for each dependent variable was run with experimental groups as the independent variable. Only the knowledge sharing ANOVA approached significance ($F_{(2, 136)} = 2.587, p = .079$) and only one post hoc pairwise comparison was significant: team competition was significantly higher in knowledge sharing than no competition ($p = .026$). Individual competition was not significantly different from either team or no competition. The knowledge hiding ANOVA was non-significant ($F_{(2, 135)} = .223, p = .800$). Thus we can stipulate that the non-significant findings of the experimental condition were not a by-product of including the control variables in the ordinary least squares regression (i.e., a
3.3 Discussion

In this experiment, we expected that team-based competition would lead to more knowledge sharing, and individual based competition would lead to less knowledge sharing (Hypothesis 1). We found partial support for this hypothesis in that the experimental condition was a significant predictor for knowledge sharing, and team competition was significantly higher than no competition. However, individual competition was not significantly lower than the control group (no competition) and the team-based competition group.

Hypothesis 2 predicted that competition would lead to more knowledge hiding. This hypothesis was not supported as the experimental condition (type and presence of competition) was not significantly related to knowledge hiding. When the means for knowledge hiding are examined, it appears as though there might have been a floor-effect with the data, in which, on average, participants reported very low rates of knowledge hiding behaviors.

The floor-effect might have occurred for a few reasons: social desirability in terms of self-reported behavior for the participants, an implicit desire to comply either with anticipated expectations of the researcher for sharing or with the knowledge seeker’s request, or the lack of opportunity for knowledge hiding.

Social desirability is often an issue with self-reports on potentially socially unacceptable behaviors. It is possible that knowledge hiding, as seen by students, is an undesirable behavior. One way to measure knowledge hiding without requiring self-reports that are vulnerable to social desirability bias is through another experimental design where the potential informers are given knowledge that they may choose to share or hide. Then the content of what is requested and shared could be analyzed by the researcher to ascertain if any relevant and requested knowledge was hidden. Future research should examine this with the three competition conditions to extend the findings presented here. Furthermore, previous research has identified that knowledge hiding occurs in organizations [25, 31]. However, similar to other deviant organizational behaviors, knowledge hiding is not a high base-rate behavior. That being said, using experience sampling methodologies to track knowledge hiding behaviors on a daily basis, Zweig and Trougakos [31] found significant amounts of knowledge hiding behaviors among organizational employees, so our low rate here might not be atypical from the natural setting.

Type II error due to any possible multicollinearity issues in the OLS regression).

There may have been a lack of opportunity for knowledge hiding if knowledge hiding is usually done verbally or requires a richer media than pencil and paper. By using pencil and paper design, it is possible participants were constrained in their knowledge hiding. To date, there has not been sufficient research examining the relationship between knowledge hiding and communication media choices. Ford and Staples [23] examined the relationship between knowledge sharing behaviors and communication media, and they concluded that behaviors that were high in knowledge sharing (e.g., full and partial knowledge sharing) were associated with a plethora of choices of communication media; whereas, it appeared as though behaviors that were lower on knowledge sharing (such as hinting) required a rich communication media channel such as face-to-face. Future research should examine this relationship for knowledge hiding. If it does require a rich communication media, then this experimental study may not have the proper context to allow for knowledge hiding to occur as much as it might have been otherwise.

Similarly, by constraining participants to a single question, it is possible that, again, there was insufficient opportunity to hide knowledge. For example, hiding a little bit of knowledge repeatedly would lead to more hiding overall than hiding a small amount of information just once. However, the single question may also have limited the knowledge sharing behavior. For example, Sarker, Sarker, Nicholson and Joshi [32] found that communication volume is associated with the (perceived) amount to be shared by the informer, such that the more the informer communicates electronically (even babbling or redundantly) the more that individual is perceived to have shared. In other words, by only having one question, the participants would not have the opportunity to share (or hide) as much as they would with multiple questions.

We should note that the participants’ knowledge sharing was not constrained by the single question, we expect the more plausible alternative explanation to be the communication media involved, social desirability, or the natural low rate of this behavior. We had limited the participants to a single question during the experiment to ensure that every participant would receive a request for knowledge, and thus have an opportunity to share or hide knowledge. Given the time constraint of the exercise, we felt that one question would be sufficient. Future research should be conducted to examine if the number of knowledge requests are associated with knowledge hiding behaviors.

4. Experiment 2: The Effect of Time Constraints on Knowledge Transfer
There are further practical considerations for employees who are considering transferring their knowledge to a colleague who has requested assistance. Although prior research has established certain necessary conditions for knowledge transfer (e.g., motivation to share, having the requisite knowledge available), these conditions may not be sufficient for the knowledge transfer to occur successfully.

Haldin-Herrgard [33] suggests that time is an important barrier to knowledge sharing in organizations. Because exchanging and internalizing information is so time consuming, it is possible that individuals with numerous other demands on their time will “triage” and focus solely on work demands for which they have primary accountability. As such, answering requests for information from colleagues may have a low priority, unless managers specifically allocate their workers time to share their knowledge with coworkers [25]. There has also been some qualitative evidence to suggest that individuals who choose not to share their knowledge with coworkers do so because of a lack of time [34, 35].

In our second experiment, we therefore examined how time constraints affect individuals’ knowledge sharing and hiding.

The Theory of Planned Behavior stipulates that behavioral control (which includes ability, opportunity, and time) is positively associated with behaviors [36]. If participants are given opportunity in this experiment in the form of the request and ability controlled through the random assignment to conditions, then the effect of time should become apparent. Thus, the more time an individual has, the more sharing s/he should be able to do. Conversely, as time becomes limited, so too would the actual behavior (and as perceptions of time limitations increase, the intentions for knowledge sharing should similarly decrease, which would also decrease knowledge sharing) [36].

It is reasonable to assume that individuals under time pressure will focus on their immediate tasks, and avoid spending precious time on knowledge sharing efforts. Thus, the following hypothesis is suggested:

**Hypothesis 3:** Time will influence knowledge sharing, such that individuals in the time pressure condition will exhibit less knowledge sharing than individuals in the no time pressure condition.

The same reasoning, however, does not apply for knowledge hiding as these are separate behaviors. Instead, an information request that occurs when the individuals are experiencing high levels of time pressure could be perceived as a competitive act in a limited resource setting (zero-sum game). That is, one may perceive that his or her partner is promoting his or her own interests at the expense of their colleagues’ performance because of the limited time for them to complete their assigned task. When time pressure is high and individuals’ partners are being perceived as threats, individuals may become more goal-centric. Given that knowledge hiding is a goal-driven behavior [22], it is therefore reasonable to assume that individuals who face time pressure will actively engage in knowledge hiding strategies. One strategy for knowledge hiding is rationalized hiding, where the individual justifies their hiding behavior. It is possible that with time constraints, hiding becomes justifiable and a rational choice. Thus, the following hypothesis is suggested:

**Hypothesis 4:** Time will influence knowledge hiding, such that individuals in the time pressure condition will exhibit more knowledge hiding than individuals in the no time pressure condition.

### 4.1 Method

The same experimental protocol and instruments (e.g., all the same measures, and same GMAT-style math questions) were used for our second study, with some notable exceptions. There were two experimental conditions based on the manipulation of time pressure perceptions: No Time Pressure (n=59) and High Time Pressure (n=64). To manipulate time pressure perceptions, the time allowance for task completion was altered in two groups. One group of participants had 20 minutes for solving the problems (no time pressure), and the other was permitted only 12 minutes to complete the task (high time pressure). There were no manipulations done regarding competition in this study. All participants in this study were told that prizes based on a random draw, regardless of their scores on the task, would be given.

This experiment involved 136 second-year undergraduate business students enrolled in the same communications course as described in the first experiment. A 90% response rate has yielded a usable sample of 123 responses. The final sample included 50 women (41%) and 73 men (59%). Most respondents were not working at the time of the experiment (77%); however, many had previous full-time and part-time work experience. Participant part-time experience ranged from none to eight years with a mean experience of about three years. Their full-time working experience ranged from none to twenty years, with a mean of about ten months. Again, we tested for differences between the experimental conditions on the control variables, which there were none (p>0.05).
4.2 Results

We assessed the time pressure manipulation by asking participants to rate the extent to which they felt pressured for time. To test this, an independent samples means test was run. Indeed, the perceived time pressure in the experimental group (High Time Pressure: mean (sd) = 5.75(1.19)) was significantly higher than the perceived time pressure reported by the control group (mean (sd) = 4.10(1.55))

To test Hypotheses 3 and 4, a regression was conducted for each of the dependent variables, with the four control variables (sex, age, math self-efficacy and trait competitiveness) and the experimental condition. The only regression that was significant was the one for knowledge sharing (F (5,117) = 2.243, p = .05, R^2 = .087); however, the only significant variable was trait competitiveness (B = .232, p < .05). Interestingly, while trait competitiveness was positively related to knowledge hiding, independent of the experimental conditions in Experiment 1, in Experiment 2, it was positively related to knowledge sharing not hiding. Experimental condition was non-significant (B=-.100, p = .265). The regression for knowledge hiding was non-significant (F(5,117) = 0.685, p = .636, R^2 = .028). (See Table 3 for the descriptive measures for the two dependent variables for the two experimental conditions.)

Table 3. Descriptive Statistics for Experiment 2

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Experimental Condition</th>
<th>N</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Sharing</td>
<td>No Time Pressure</td>
<td>59</td>
<td>4.12</td>
<td>1.58</td>
</tr>
<tr>
<td></td>
<td>High Time Pressure</td>
<td>64</td>
<td>3.83</td>
<td>1.72</td>
</tr>
<tr>
<td>Knowledge Hiding</td>
<td>No Time Pressure</td>
<td>59</td>
<td>1.39</td>
<td>0.67</td>
</tr>
<tr>
<td></td>
<td>High Time Pressure</td>
<td>64</td>
<td>1.26</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Two independent sample means tests were also run to compare the high time pressure group to the no time pressure group, without the control variables included, for the two dependent variables. There were no significant differences in the means for the two groups for both dependent variables. Again, we can conclude that the non-significant findings of the experimental condition were not a by-product of including the control variables in the regression analysis.

4.3 Discussion

Hypotheses 3 and 4 were not supported. There are several possible reasons for this. Some alternative explanations may be that time pressure was not sufficiently manipulated, in that there was no “extreme” time pressure. It may be that in an extreme time pressure condition, knowledge hiding becomes more prevalent due to increased threats to one’s goals. Future research should examine this by replicating with an additional time pressure condition (e.g., 7 minutes to complete the task). Similarly, future research may want to include an “excess time” condition to see if more time increases knowledge sharing opportunities, as suggested by an increase in behavioral control. An important note should be that it is likely the perceived time pressure that is relevant, not actual time pressure. Although our experiment successfully manipulated time pressure in that there were differences between the two groups, it might be that there needs to be more variance between the groups to capture the effect of time on knowledge sharing and knowledge hiding.

Again, the alternative explanation regarding knowledge hiding requiring a richer communication media may also explain why knowledge hiding was not affected by the time pressure condition. Similarly, the artificial limit of a single request may have limited the opportunities for knowledge sharing and knowledge hiding. An important note to make, however, is that should future research examine this and include multiple requests, then the impact of multiple requests and perceptions of time pressure should be taken into consideration as well.

It is furthermore important to consider the possibility that participants’ knowledge transfer behaviors are entirely spontaneous. In this case, participants may have been sensitive to the framing of the knowledge hiding measures, which imply a certain degree of premeditation (e.g., intentional withholding of information). However, we should note that the specific items that were used to assess knowledge hiding (e.g., “said that I was too busy to answer” do not specifically raise the issue of intentionality.

Finally, it may also be that time actually does not impact knowledge sharing or knowledge hiding. Indeed, given the wide variety of other situational, interpersonal, and individual factors that explain knowledge transfer behavior in groups and organizations (e.g., knowledge sharing climate [19], propensity to share and value of knowledge [9], individual differences [37]), “time” may simply be too distal a variable to have an appreciable impact. For example, in another study, it was found that perceived behavioral control, which includes a perception of available time to share knowledge along with opportunity and ability, does not have a significant relationship with full knowledge sharing behaviors [7].

Does this mean that time does not play a role at all with knowledge transfer within organizations? Another possibility to consider is that time availability and time urgency may affect other knowledge transfer behaviors than those that we examined in this study, such as the concept of “Disengagement from knowledge sharing” [23]. Disengagement is defined as “the simultaneous
withdrawal and defense of a person’s preferred self in behaviors that promote a lack of connections, physical, cognitive and emotional absence, and passive, incomplete role performances… To defend the self is to hide true identity thoughts, and feelings during role performances” [38, p. 701]. While engagement and disengagement have been discussed with respect to role performance (i.e., job performance) [39, 40], it has also been applied to the knowledge sharing roles that individuals may play within the organization [24].

Kahn proposed three antecedents for engagement (and conversely, disengagement): meaningfulness, safety and availability. Availability implies that the individual has sufficient psychological, emotional and physical resources at his/her disposal to be fully present within the role. If the individual is stressed, tired, distracted with other matters, then s/he would not be engaged in the role [41]. Ford [24] found that these three antecedents applied to disengagement from knowledge sharing roles, and in particular, availability was the most relevant predictor. Among the factors for availability was available time or “being too busy with other tasks” [24]. She also found that approximately 70% of the incidents of lack of knowledge sharing were incidents that match the criteria for disengagement, the other 30% fit the criteria for partial hiding or full hiding, and only 7% of the incidents were self-motivated (e.g., protection of oneself, power). Thus, if time does play a role in disengagement, it would be a key factor for removing the lack of knowledge sharing within organizations via disengagement.

Thus, it is possible that time does not impact knowledge sharing or knowledge hiding, per se, but rather it may impact the disengagement from knowledge sharing, where the individual is neither intentionally sharing nor intentionally withholding knowledge. Future research should examine this further by measuring disengagement as well as knowledge hiding and sharing.

5. Discussion

In the two experiments, we hypothesized that time pressure and competition would impact knowledge sharing and knowledge hiding behaviors. We manipulated competition in Experiment 1, and time pressure in Experiment 2.

The findings of these two experiments offer potentially important implications for practitioners. Given that the participants in the “team competition” condition were more likely to share knowledge than those who were competing individually or who were not competing, managers should consider how they can introduce a “team” aspect to the work environment. The findings also provide some insight for the designers of knowledge management systems. It is already known that knowledge management systems should provide the means for eliciting, transferring, storing and retrieving knowledge. The findings of this study emphasize the need to consider the contextual environment in which the system will be used. Given the abovementioned results, employees may accept and use knowledge management systems when they feel a sense of a “team,” and when there is an implicit or explicit team competition. Nevertheless, it would be important that these teams have shared rewards, rather than a superficial “team” label, shared work space, or similarity in job description.

The finding that time urgency or time availability may not significantly affect the actual incidence of knowledge transfer behaviors is also of interest to practitioners, given the popularity of “a lack of time” as an excuse for a failure to share knowledge with colleagues. Managers who hear this rationale from employees will need to consider if there are other factors (e.g., interpersonal issues, competition for scarce resources, perceived lack of management commitment to knowledge sharing) that may be affecting their employees’ behaviors. Similarly, it may be that there is the issue with disengagement; however, more research is required before conclusions may be made regarding this possibility.

5.1 Limitations & Future Research

This research has some limitations that future research should seek to address. Our sample was comprised of undergraduate Commerce students. Although most students had some work experience, it is possible that an older sample with more work experience or with more or less education would behave differently. The fact that age was correlated with knowledge hiding behaviors is somewhat troubling in this regard.

Furthermore, it is possible that the experimental setting did not approximate the work environment sufficiently. In an organizational setting, workers can communicate via a wide variety of means, and other contextual factors (such as interpersonal relationships) may further affect workers’ knowledge transfer behaviors. However, because we were interested in the effects of competition and time urgency on knowledge transfer, and because these conditions can be readily manipulated (unlike interpersonal relationships), an experimental research design was suitable for this investigation. Nonetheless, we encourage further research that uses complementary research methods and that may be more generalizable.

In addition, the experimental manipulation may not have been strong enough. Thus, other ranges of allotted times as well as other competition incentives may be
used in future research for generating stronger effects. Finally, it should be noted that the measure of knowledge hiding may be an under-estimate of actual knowledge hiding, because individuals, in accordance with the attribution theory [42], tend to under-report negative behaviors. Thus, future research may seek ways for more accurately observing and measuring knowledge hiding behaviors.

Although our research has investigated the effects of time pressure and competition separately, it is possible that an interaction effect would be significant. For example, when individuals face high time pressure they may be more likely to hide knowledge than individuals under less time pressure when competition is individually-based. It would be interesting to see how time pressure influences knowledge sharing within teams when competition is team-based. Future experiments can address this possibility by designing a 2x3 experiment to allow for this type of analysis. We chose to not do a 2x3 experiment initially as this was the first time knowledge hiding was examined experimentally together with knowledge sharing. Thus, we chose to limit the complexity of the experimental designs to focus on the primary variables of interest. Future research may also want to include propensity to share knowledge or other individual factors into the study, and that alternative modes of communication be used (e.g., voice, email) with all KS/KH behaviors (full knowledge sharing, partial knowledge sharing, knowledge hiding and disengagement).

It would be furthermore interesting to test whether intrinsic or extrinsic motivation mediates the relationship between competition and knowledge transfer. Finally, to improve on the experimental design, it would be best if requests came from a confederate as opposed to other participants so the nature and type of request could be controlled as well.

6. Conclusion

In many organizations, the competition between employees is intense. Few employees have high levels of job security, as an increasing number of tasks are being outsourced or off-shored. In such conditions, knowledge transfer among supply chain members, and even among members of distributed teams from the same organization, is essential for success. Nevertheless, anecdotal evidence shows that even when the appropriate technical infrastructure is in place, employees may be reluctant to transfer their knowledge and use the infrastructure. In this study, we posited that environmental factors, some of which managers can control, can promote knowledge transfers in the forms of increased knowledge sharing and reduced knowledge hiding.

Our findings suggest that there are several distinct knowledge transfer behaviors that need to be considered, and that they may be affected by employee attributes (i.e., trait competitiveness and age) as well as by situational factors (team-based competition versus no or individual based competition). Thus, it is hoped that future research sheds more light on the roles situational and personal factors play in knowledge transfers. More research on a broad spectrum of knowledge transfer behaviors, their predictors and outcomes is certainly warranted.

8. References


