WHY SHARING INFORMATION IN TEAM? A STUDY ON PROJECT-BASED IS TEAM LEARNING

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ABSTRACT
Appropriate management of the corporations among team members is important to guarantee the teamwork quality. In this study, based on social exchange theory and trust theory, we investigated the relationship between teamwork quality and both team and individual performance. Specifically, we identified two moderators, leader-member exchange (LMX) and perceived organization support (POS), which can moderate the effect from teamwork quality to both team and individual performance. Empirical study was conducted to provide support for our model. The result indicated that LMX has significant moderation effect on the relationship between teamwork quality and individual performance. POS had significant moderation effect on the relationship between teamwork quality and team performance.

Keywords: information sharing, leader-member exchange, perceived organization support, teamwork quality

INTRODUCTION
Organizations are under constant pressure to create synergies in the resources under their control [21]. Among all factors, which can influence a firm’s performance, teams and knowledge management are two areas that are often fruitful in providing increased value to the firms when they are carefully managed. Teams can increase capability, flexibility, and responsiveness [25], while knowledge management is believed to be crucial to organizational performance [1]. Various forms of collaboration between team members within the organizations can provide the foundation of project success [29]. As a result, team study has become a staple of organizational research as companies continue to evolve toward more organic structures [39]. As for the knowledge management, Fama and Jensen [13], [14] suggested that possessing knowledge, particularly if it is hard to come by, can be a source of power and therefore increase the firm’s competitive advantage. As a result, how to facilitate knowledge sharing within team members is an important issue for organizations to improve their efficacy.

Teamwork quality (TWQ) was proved to be an important antecedent of team project success [22]. Although the conclusions of previous studies are quite consistent, depending on the work environment and organization culture, there are also other possible moderators, which could influence the relationship between TWQ and team performance. Trust, for example, can be one of them. Team members need to have confidence that information shared within the team is accurate and that team member providing the information is competent [37]. Under the organization context, there are two types of trust, conditional trust and unconditional trust [24]. While conditional trust mainly depends on favorable attitude toward the outcome of the behavior, unconditional trust mainly depends on shared values and common bond among the team members. Previous studies suggested that people with high unconditional trust tend to have more communication with each other and therefore enhance the efficiency of work flow [8]. The development of a shared understanding of the project is integral to team members’ successful agreement [20]. In other words, although the presence of conditional trust allows a team to work toward a common goal, the existence of unconditional trust can fundamentally change the quality of the ex-change relationship and convert a group of people into a team with commitment.

Therefore, the purpose of this paper is to identify factors which can enhance unconditional trust within the team and therefore moderate the relationships between TWQ and team performance. The theoretical background and hypotheses development will be discussed in the next section followed by the data analysis and discussion.

THEORETICAL BACKGROUND AND HYPOTHESES
The performance of a team is affected by the quality of teamwork. Hoegl and Gemuenden [22] develop six teamwork facets to measure the quality of interactions within team members: communication, coordination, balance of member contributions, mutual support, efforts, and cohesion. Communication indicates the properties of frequency, formality, straightness, and openness to exchange information among team members [31].
Coordination shows the harmonization and synchronization of team members when tasks are distributed to individuals [3]. Balance of member contributions is another factor that detects whether or not each member has contributed specific his or her knowledge or expertise to the team [36]. In addition, during the process of the team project, many tasks are interdependent from each other. Thus, being able to support mutually is also a critical factor to make the team more productive [38]. After the workload of a project is assigned, whether or not the team member can commit to the assigned task is an indicator of the effort of the team members would like to dedicate to the team. Finally, cohesion describes how keen the team members would like to stay in the team. The degree of cohesion is affected by the sense of belonging and can intensify the collaboration [30]. The analysis from [22] had confirmed that the six observed variables mentioned above pertain to the same latent construct and about 72% of variance is explained. Also, the standard regression coefficients of a linear regression between six observed variables and team quality are in the range of 0.16 to 0.22 showing all six variables have similar contribution in measuring the team quality. Thus, we will adopt all six variables as observed indicators in our model. Consistent to the previous study, we hypothesize that:

**H1:** Team Work Quality (TWQ) is positively related to the team performance.

Besides team’s success, individual’s own achievement is also an outcome of high level of TWQ. The two constructs, satisfaction and learning, were suggested to build the category of personal success of each team members [22]. High level of TWQ can lead to team members’ satisfaction with their work situation and provide an opportunity for team members to acquire knowledge and skills [4], [5], [32]. Therefore, higher TWQ will lead to higher personal feeling of achievement. Thus, in light of these theoretical investigations, we hypothesize that:

**H2:** Team Work Quality (TWQ) is positively related to the personal success.

Although, the relationships between TWQ and team and personal success were well established by previous studies, the various moderators that can influence these relationships are not clear. Thus, we would like to go a step forward to identify these factors in our study.

The Leader-Member Exchange (LMX) that was originally derived from the model of leadership called Vertical Dyad Linkage (VDL) to establish a leadership theory [9] that commonly measures the relationship between a team leader and his or her subordinates. LMX addressed the issue from a relationship-based approach. It can involve many extents of the relationships such as (a) all members and their relationships in a system, (b) the interactions between members of a dyad, (c) the interdependent patterns of their behavior, (d) the sharing of outcomes, and (e) the development of conceptions of environments, cause maps, and value [34]. Thus, the theory had been considered for several levels of analysis including group-level effect, dyad-level effect and the combination of dyads into groups [19].

Scandura et al. [33] argued that those subordinates who had high quality of LMXs were found to have high level of decision influence, regardless their superiors’ rating of their expertise. Higher quality LMX resembled social exchanges in that the exchange extends beyond what is specified in the formal job description [26], [27]. In other words, it can help to foster organizational citizenship based on the commitment and trust among the team members. Because high trust, interaction, support, and rewards characterize higher-quality LMX, there is a perceived obligation on the part of subordinates to reciprocate this higher-quality relationship [10]. The behavior of team members will be guided by the common goal of the team. The unconditional trust is higher in such team. In contrast, similar to pure economic exchanges, lower-quality LMX are limited to exchanges that take place according to the employment contract. These relationships are characterized by low trust, interaction, support, and rewards [10]. For these people in the lower-quality LMX environment, the rating from superiors is critical. The behavior of team members will be guided by the monetary reward instead. The trust in such team is conditional. Additionally, better LMX is also treated as respect between leader and subordinates and therefore enhance communication between members (Qaquebeke and Eckloff 2010). LMX was also found to have positive effect on the formation of team members’ common value toward the project and therefore increase the success possibility of the project [23]. To sum up, higher-quality of LMX is an indicator of higher level of unconditional trust. Thus, the quality of LMX can moderate the relationship between TWQ and team performance and personal success.

**H3** LMX positively moderates the relationship between TWQ and team performance.

**H4** LMX positively moderates the relationship between TWQ and Personal Success.

Besides LMX, employee’s performance may also be affected by some other factors. The internal context or culture of an organization can also
influence team performance [8]. Someone believes that when an organization values the contributions from the employees and care about their well-being, such supports can incur the commitment and subsequently increase work effort. Theory of Perceived Organizational Support (POS) basically can be used to confirm this belief. POS refers to global beliefs held by employees regarding the extent to which their organizations value their contributions and care about their well-being [15]. Referring to Blau’s study [2], the perceived organizational support would be influenced by the frequency, extremity, and judged sincerity of statements of praise and approval from the organization. It implied that employees would expect an organization to provide greater reward to match their effort toward organizational goals. This expectancy can develop positive emotional bond to the organization. The social exchange view confirms that the commitment to the organization is strongly influenced by their perception of the organization’s commitment to them [12]. Thus, high level of POS will show the care from the organization and therefore lead to high level of commitment from the team members. Therefore the relationship between TWQ and team and individual’s performance can be enhanced. The team with higher POS will have more commitment to the organization. It will help to build a common value between organization and team members and therefore enhance their performance.

H5 POS positively moderates the relationship between TWQ and team performance.
H6 POS positively moderates the relationship between TWQ and personal success.

The research model is shown in Figure 1.

![Conceptual Research Model](image)

**Figure 1 Conceptual Research Model.**

**MEASUREMENT AND DATA ANALYSIS**

The study was conducted in a university in Hong Kong. Participants were undergraduate students who had registered in a course in business school. The course instructor was defined as the leader to all students’ teams during the data collection process. Students were divided into 13 groups. Each group was asked to find a real-world project to conduct a Web-based information system project. The project lasted for the whole semester. Thus, students had chance to work with the instructor and their clients for 13 weeks. When the project was finished, students were asked to answer a questionnaire about their teams’ quality, performance, LMX, POS, and individuals’ success. The course instructor evaluated the teams' performance as well.

We tried to adopt the existing measurement if they can be found. For LMX, we adopted Graen and Uhl-Bien’s measurement [19] in which a single measurement with seven items is recommended. The same measurement was also used in Schriesheim et al.’s study [35]. The measurement of POS is from Eisenberger et al.’s study [11] that adopts nine items of Survey of Perceived Organizational Support (SPOS). Students were asked to indicate their degree of agreement to these items on five-point scales ranging from "strongly disagree" (1) to "strongly agree" (5). The measurements of TWQ, team performance and personal success were adopted from Hoegl and Gemuenden’s study [22].

Since team quality, team performance and personal success are three formative second-order constructs, while the moderators (LMX and POS) are reflective first-order constructs, we cannot use repeated indicators approach [28]. Instead, here we use factor score approach to construct the second-order factor and analyze the model with all first-order factors instead of the second-order factors in measurement model. The psychometric properties of all order factors (CFA, discriminant validity, reliability) were assessed. We then took the construct score for each first order factor. Finally, we created a new model with the construct scores as the indicators of the second order construct.

For the similar reason, we cannot create moderators by product indicator approach directly. We used two-stage approach instead. (Please refer to [7] for details). We calculated construct level scores for each construct, and multiplied the construct level scores to create single indicator for interaction term.

**RESULTS AND CONCLUSIONS**

PLS (Partial Least Square) uses component-based estimation to maximize the variance explained in the dependent variable. It does not require multivariate normality of the data and is less demanding on sample size [6]. Compared to covariance based structural models, PLS methods are more flexible and are more appropriate for
exploratory study aiming at finding new theory or extending current literature to new context [16]. Considering that our study is exploratory and conducted in a new context, we select PLS method to implement data analysis. SmartPLS 2.0.M3 was used for the data analysis. For the measurement model, Teamwork Quality (TWO) was modeled as a formative second-order construct with six reflective first-order constructs. Team Performance (TP) and Personal Success (PS) were modeled as formative second-order with two reflective first-order constructs. The two moderators, Leader-Member Exchange (LMX) and Perceived Organizational Support (POS) were modeled as reflective first-order constructs. The descriptive statistics is shown in Table 1.

Table 1. Descriptive Statistics

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean (STD)</th>
<th>Composite Reliability</th>
<th>AVE</th>
<th>Cronbach’ Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>COM (Communication)</td>
<td>4.19 (.64)</td>
<td>0.8681</td>
<td>0.63</td>
<td>27</td>
</tr>
<tr>
<td>COO (Coordination)</td>
<td>4.09 (.73)</td>
<td>0.8753</td>
<td>0.64</td>
<td>24</td>
</tr>
<tr>
<td>BMC (Balance of Member Contributions)</td>
<td>4.10 (.70)</td>
<td>0.8445</td>
<td>0.64</td>
<td>44</td>
</tr>
<tr>
<td>MS (Mutual Support)</td>
<td>4.22 (.60)</td>
<td>0.8888</td>
<td>0.57</td>
<td>24</td>
</tr>
<tr>
<td>EFF (Effort)</td>
<td>3.77 (.89)</td>
<td>0.8807</td>
<td>0.71</td>
<td>28</td>
</tr>
<tr>
<td>COH (Cohesion)</td>
<td>4.18 (.67)</td>
<td>0.9227</td>
<td>0.63</td>
<td>27</td>
</tr>
<tr>
<td>Q (Quality)</td>
<td>4.02 (.77)</td>
<td>0.8647</td>
<td>0.68</td>
<td>25</td>
</tr>
<tr>
<td>TPE (Evaluation)</td>
<td>4.33 (.76)</td>
<td>0.9413</td>
<td>0.84</td>
<td>25</td>
</tr>
<tr>
<td>WS (Work Satisfaction)</td>
<td>4.09 (.73)</td>
<td>0.8890</td>
<td>0.72</td>
<td>78</td>
</tr>
<tr>
<td>L (Learning)</td>
<td>4.19 (.67)</td>
<td>0.8980</td>
<td>0.69</td>
<td>06</td>
</tr>
<tr>
<td>LMX (Leader-Member Exchange)</td>
<td>3.48 (.53)</td>
<td>0.8050</td>
<td>0.52</td>
<td>61</td>
</tr>
</tbody>
</table>

For all constructs, the internal consistency and convergent validity were evaluated by examining the item construct loading, average variance extracted (AVE), composite reliability, and Cronbach’ Alpha value. Convergent and discriminant validity is inferred when the PLS indicators (1) load much higher on their hypothesized factor than on other factors (own-loadings are higher than cross-loadings), and (2) when the square root of each construct’s average variance extracted (AVE) is larger than its correlations with other constructs [16].

For individual item reliability, item loadings are higher than 0.60. The Alpha values are higher than 0.72. We also calculated item cross-loadings based on the procedure recommended for PLS [17]. Each item loaded higher on its principal construct than on other constructs (please see Table 2). While cross-loadings derived from this procedure will be inevitably higher than from typical exploratory factor analysis, the cross-loading differences were much higher than the suggested threshold of 0.1 [17]. All AVE were larger than 0.53 except LMX which is 0.45. The convergent validity of all constructs except LMX was good.

Table 2 Correlation Matrix and Average Variance Extracted for Principal Constructs.

<table>
<thead>
<tr>
<th>Construct</th>
<th>BM</th>
<th>CO</th>
<th>O</th>
<th>CE</th>
<th>MO</th>
<th>EF</th>
<th>L</th>
<th>MS</th>
<th>P</th>
<th>O</th>
<th>WS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BM</td>
<td>1.00</td>
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<tr>
<td>CO</td>
<td>0.00</td>
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<td>O</td>
<td>0.00</td>
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<td>CE</td>
<td>0.00</td>
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<td>MO</td>
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<td>0.00</td>
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<tr>
<td>EF</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
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<tr>
<td>L</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>MS</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<td>P</td>
<td>0.00</td>
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</tbody>
</table>

The convergent validity of all constructs except LMX was good.
The diagonal elements represent the square root of the AVE. For discriminant validity, diagonal elements should be larger than off-diagonal elements.

The PLS path coefficients are shown in Figure 2. For better presentation, the item loadings of each construct are omitted. A bootstrap analysis was performed with 500 subsamples. The R square for TP and IS are 0.553 and 0.691. The significant testing results were shown in the Table 3 where H1, H2, H4, and H5 are supported, but H3 and H6 are not supported.

![Figure 2 PLS Path Coefficient.](image)

**Table 3 The bootstrap analysis results.**

<table>
<thead>
<tr>
<th></th>
<th>T Statistics</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMX x TWQ -&gt; IS</td>
<td>3.6480</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>LMX x TWQ -&gt; TP</td>
<td>0.8487</td>
<td>0.2374</td>
</tr>
<tr>
<td>POS x TWQ -&gt; IS</td>
<td>0.7516</td>
<td>0.9729</td>
</tr>
<tr>
<td>POS x TWQ -&gt; TP</td>
<td>2.9475</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>TWQ -&gt; IS</td>
<td>9.7688</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>TWQ -&gt; TP</td>
<td>3.5722</td>
<td>&lt; 0.1</td>
</tr>
</tbody>
</table>

Consistent to the previous studies on team performance, we found that TWQ has significant effect on both team and individual’s success. The result confirmed that TWQ is a fundamental factor to team project success. The individual members can also learn from the success process and therefore enhance their own perceived achievement.

Although LMX moderated the relationship between TWQ and individual success, the moderating effect on the relationship between TWQ and team performance was not significant. This might be due to that LMX is dyad relationship between supervisor and team member. It is personal orientated and indicated the relationship between individuals. If a team member cannot feel be appreciated by his/her supervisor, the perceived achievement can be lowered. However, since the goal of the team project is clear, low LMX will not influence the whole team’s performance.

POS was found to moderate the relationship between TWQ and team performance but not the relationship between TWQ and individual success. The perceived organization support was mainly from project’s client. The support was offered to accomplish the project. Therefore, it was project orientated. Lack of such support will make the project process slower down. However, if the project failed in this way, the individual will perceive that the reason of failure is because the lack of support from client rather than lacking essential of himself/herself. As a result, lack of POS will not influence individual’s own evaluation.

**DISCUSSIONS AND CONCLUSIONS**

This study identified two moderators, LMX and POS, for the relationship between TWQ and team and individual’s success. Specifically, LMX moderated the association between TWQ and individual success while POS moderated the one between TWQ and team performance. The results had higher generalization since the students were asked to conduct real-world projects rather than a course project during data collection process.

Based on the results, there are some implications to industry. First, since TWQ is a fundamental factor of team project success, an organization needs to consider providing more friendly environment and organization culture to enhance TWQ. Secondly, since LMX can moderate the relationship between TWQ and individual success, a team leader should interact with members patiently to link the corporate goal to individual goal. Finally, the organizational support is always important for team members to dedicate themselves for better team performance.

**REFERENCE**


