A Moderated Mediation Model of the Relationship between Perceived Leader Support and Creativity

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Abstract. Given numerous calls for further investigation on understanding the theoretical mechanisms between perceived leader support (PLS) and creativity, this study divided creativity into two phases—idea generation and idea development, and focused on how team member’s knowledge activity mediated the relationship between PLS and the two phases. It also looked at how team member’s motivation orientation might moderate the mediated relationships. 236 individual data gathered from two Undergraduate Entrepreneurship Competitions were used to test this moderated mediation model. Results show that knowledge acquisition and knowledge sharing mediate PLS-idea generation, PLS-idea development relationships separately. In addition, intrinsic and extrinsic motivation synergistically moderated the indirect PLS-idea generation relationship via knowledge acquisition, while only intrinsic motivation moderates the indirect PLS-idea development relationship.

Introduction
Successful innovation derives from the production of novel and useful creative ideas [1]. This has led to abundant theoretical and empirical literature on the antecedents of creativity, among which the leader support might be the most prominent one because of its direct influence on employees [2]. Perceived leader support (PLS) refers to the perceptual reactions of subordinate to the support behaviors of immediate supervisor [2]. Although prior research have confirmed a positive association between PLS and creativity [3], two questions have been neglected. First, creativity in most literature was defined as an outcome variable, namely, reflecting the production of novel and useful ideas. In fact, creativity is a complex process involving several different stages, in which individual’s creativity performs differently. More recent studies have adopted a process view of creativity from idea generation to idea development, and demonstrated different stage has different antecedents and impact mechanism [4]. Second, though much attention has been paid to PLS-creativity relationship, we know very little about the theoretical mechanisms that may underlie this relationship. To fill these two voids, this study aims to investigate how perceived leader support affect idea generation and idea development by adopting a process view of creativity.
Past research has reported that idea generation and idea development are inherently embedded in social knowledge activities [5]. Among those knowledge activities, knowledge acquisition (KA) and knowledge sharing (KS) were verified to be positively related to creativity [6]. In idea generation stage, domain-relevant and creativity-relevant knowledge must be acquired to generate ideas as many as possible. In idea development stage, the main task is to implement those ideas selected by team, thus collaborative behavior, such as knowledge sharing, makes a critical difference. Consequently, this study tries to make it clear that PLS affects idea generation and idea development through different knowledge activity.
If PLS affects idea generation and idea development through KA and KS separately, how to enhance this mediating effect? Motivation orientations, both intrinsic motivation (IM) and extrinsic motivation (EM), have long been known to facilitate knowledge activities and creativity. They are
significantly related to individuals’ willingness to do their work, the level of efforts they are likely to make, and the quality of their performance. Thus, this study also examines the possible moderating effects of motivation orientations on the relationship between PLS and creativity through knowledge activities.

**Hypotheses**

**The Mediating Role of KA in the Relationship between PLS and Idea Generation**

By definition, idea generation refers to the thoughts and ideas in subordinates’ minds. If subordinate perceives that the leader encourages him or her to come up with creative ideas, gives him job autonomy, and provides him with accessible sources, his idea generating process would be more active. As a result, the thoughts and ideas in subordinates’ mind would be more.

Furthermore, based on knowledge management theory, individual creativity could be enhanced by KA—acquiring knowledge from the existing instrument [7]. Meanwhile, KA could be facilitated if there is abundant available knowledge and information. When subordinate perceives that his or her leader makes effort to provide them with knowledge and information, e.g. sending them to training, their KA behaviors could be enhanced. In turn, their creative ability is improved. Consequently, they will generate more high quality creative ideas. Thus, we hypothesize:

- **Hypothesis 1a**: PLS is positively related to idea generation.
- **Hypothesis 1b**: KA mediates the relationship between PLS and idea generation.

**The Mediating Role of KS in the Relationship between PLS and Idea Development**

In idea development stage, those selected ideas are developed through cooperation among subordinates. It is a socialization process in which subordinates interact, exchange, cooperate with each other. The key lies in how to motivate subordinates to cooperate and exchange knowledge. If subordinates perceive a harmonious and sharing work environment built by the leader, they will be glad to devote into knowledge exchange [8]. In addition, the rational organization structure and communication channel built by the leader also make subordinates feel that they are supported to exchange knowledge [9]. In turn, individuals’ creativity will be promoted by KS. Thus, we hypothesize:

- **Hypothesis 2a**: PLS is positively related to idea development.
- **Hypothesis 2b**: KS mediates the relationship between PLS and idea development.

**The Moderating Roles of IM and EM**

Motivation refers to individuals’ willingness to do their work, the level of efforts they are likely to expend, and the quality of their performance [2]. Individuals are intrinsically motivated when they seek enjoyment, interest, satisfaction of curiosity, or personal challenge in the work; and extrinsically motivated when they are engaged in the work in order to obtain some goals that are apart from the work itself e.g. evaluation, money or other tangible incentives. Previous research found that the interaction of high IM and EM has a positive effect on creativity [2]. They play mediator roles between leadership and creativity, or at least intervening roles [10]. In addition, individual with different motivations shows different knowledge behaviors. Thus, we hypothesize:

- **Hypothesis 3a**: Both IM and EM will moderate the relationship between PLS and idea generation through KA such that the PLS-KA path will be stronger when both motivations are higher than lower.
- **Hypothesis 3b**: Both IM and EM will moderate the relationship between PLS and idea development through KS such that the PLS-KS path will be stronger when both motivations are higher than lower.
Methods

Participants

Data were collected during two Undergraduate Entrepreneurship Competitions in two Chinese well-known universities. The final research sample consisted of 236 individual from 42 teams. The member of respondents per team ranged from 2 to 13, with the average of 5.6 members. All participants were between 18 and 28 years old. About 75% participants majored in natural science and 25% majored in social science.

Data were gathered from multiple sources. The first survey was conducted after teams registered the competitions, team members were asked to complete questionnaires on IM and EM about this entrepreneurship competition. And they were also asked to record their initial ideas in a special sheet. The second survey was conducted at the final presentation day, each member was asked to finish a questionnaire on the PLS, KA and KS for this competition. Team leaders were asked to measure how much each member contributes to the idea development process.

Measures

PLS, KA, KS, IM and EM were measured through 5-point scales ranging from 1 (strongly disagree) to 5 (strongly agree). PLS was self-reported and assessed with three items adopted from Amabile et al. (2004)[2]. KA was assessed with a four-item scale developed by authors. Those items were extracted from previous measurement of knowledge seeking intention and cost [11]. KS was assessed with four item adopted form Carmeli et al. (2013)[12]. IM was measured with a six-item item scale adopted from Amabile et al. (1994)[10]. EM was measured with a four-item scale adopted from Amabile et al. (1994).

Idea generation was measured by counting numbers of ideas one came up with. Idea development was measured by leader’s assessment on their contribution in idea development process ranking from 1 (no contribution at all) to 5 (contribute greatly).

Results

Table 1 presents the descriptive statistics for the variables and correlations among them.

<table>
<thead>
<tr>
<th></th>
<th>PLS</th>
<th>KA</th>
<th>KS</th>
<th>IM</th>
<th>EM</th>
<th>IG</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLS</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KA</td>
<td>0.185**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KS</td>
<td>0.381**</td>
<td>0.176**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IM</td>
<td>0.015</td>
<td>0.177**</td>
<td>0.070</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EM</td>
<td>0.010</td>
<td>0.235**</td>
<td>0.054</td>
<td>0.262**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IG</td>
<td>0.317**</td>
<td>0.374**</td>
<td>0.211**</td>
<td>0.190**</td>
<td>0.182**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>0.439**</td>
<td>0.106</td>
<td>0.702**</td>
<td>0.151*</td>
<td>0.113</td>
<td>0.169**</td>
<td>-</td>
</tr>
<tr>
<td>Mean</td>
<td>3.74</td>
<td>3.82</td>
<td>3.84</td>
<td>3.82</td>
<td>3.82</td>
<td>7.49</td>
<td>3.55</td>
</tr>
<tr>
<td>SD</td>
<td>0.85</td>
<td>0.88</td>
<td>0.99</td>
<td>0.76</td>
<td>0.85</td>
<td>4.88</td>
<td>1.42</td>
</tr>
</tbody>
</table>

Note: ** p<0.01, * p<0.05, two tail

Cronbach’s alpha for all the variables are above 0.8 indicating a high internal consistency.. Exploratory factor analysis showed a dominant 5-factor solution based on eigenvalue larger than 1. Five factors explained 70.612 percent of variance. Each item loaded on its hypothesized factors with factor loading ranging from 0.690 to 0.901, and cross-loading less than 0.219, which indicated the convergent and discriminant validity of variables.

A two-step method which had used by Cole, Walter, and Bruch (2008) was employed to test hypotheses here [13]. First, we examine the simple mediation (H1a, H1b, H2a, H2b). Second, we test
the overall moderated mediation model (H3a, H3b). Prior to analysis, all continuous variables were mean-centered.

**Tests of Mediation**

To test mediation, an SPSS macro developed by Preacher and Hayes (2004) was adopted [14]. Their SPSS macro estimates the indirect effect with a bootstrap approach to obtain confidence intervals (CIs). Table 2 has shown the results for H1a, H1b, H2a, H2b. Table 3 has shown the bootstrap results for indirect effects.

Table 2. Regression Results for Simple Mediation.

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Model I KA</th>
<th>Model II Idea generation</th>
<th>Model III KS</th>
<th>Model IV Idea development</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLS</td>
<td>0.185**</td>
<td>0.234***</td>
<td>0.380***</td>
<td>0.207***</td>
</tr>
<tr>
<td>KA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KS</td>
<td></td>
<td>0.065</td>
<td>0.631***</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.034</td>
<td>0.208</td>
<td>0.144</td>
<td>0.529</td>
</tr>
<tr>
<td>F</td>
<td>8.281**</td>
<td>20.257***</td>
<td>39.383***</td>
<td>86.819***</td>
</tr>
</tbody>
</table>

Note: N=236. Standardized regression coefficients are reported. *** p<0.001, **p<0.01, * p<0.05.

Supporting hypothesis 1a, PLS was positively associated with idea generation (Model II, $\beta=0.234$, t=3.668, P<0.001). Also, supporting hypothesis 2a, PLS was positively associated with idea development (Model IV, $\beta=0.207$, t=4.222, P<0.001). KS is not significantly related to idea generation (Model II, $\beta=0.065$, t=1.020, P=0.309), thus, KS does not perform a mediating role on PLS-idea generation relationship. KA is not significantly related to idea development (Model II, $\beta=-0.044$, t=-0.963, P=0.336), thus, KA does not perform a mediating role on PLS-idea development relationship.

Table 3. Bootstrap Results for Indirect Effects.

<table>
<thead>
<tr>
<th>Indirect path</th>
<th>Effect</th>
<th>Boot SE</th>
<th>LL 95% CI</th>
<th>UL 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLS-KA-idea generation</td>
<td>0.348</td>
<td>0.147</td>
<td>0.091</td>
<td>0.685</td>
</tr>
<tr>
<td>PLA-KS-idea development</td>
<td>0.398</td>
<td>0.086</td>
<td>0.245</td>
<td>0.579</td>
</tr>
</tbody>
</table>

Note: N=236. Bootstrap sample size=1000, LL=lower limit; CI=confidence interval; UL=upper limit

From table 3, we can see that PLS was found to have an indirect effect on idea generation via knowledge acquisition (indirect effect=0.348). The hypothesis 1b was supported by the bootstrap results, with a bootstrapped 95% CI around the indirect effect not containing zero (0.091, 0.685). Also, PLS was found to have an indirect effect on idea development via knowledge sharing (indirect effect=0.398). The hypothesis 2b was supported by the bootstrap results, with a bootstrapped 95% CI around the indirect effect not containing zero (0.245, 0.579).

**Tests of Moderated Mediation**

Before testing the moderated mediation model, we first examined the simple moderating effects of motivation orientation on PLS-KA, and PLS-KS relationships. Table 4 presents the results of simple moderating effects. Results indicated that the cross-production term between PLS and IM was significantly positive related to KA ($\beta=0.211$, t=3.021, P<0.01), and KS ($\beta=0.211$, t=2.676, P<0.01). However, the cross-production term between PLS and EM was only significantly positive related to KA ($\beta=0.133$, t=1.857, P<0.1), not related to KS ($\beta=0.046$, t=0.569, P=0.570). Thus, the EM will not moderate the indirect relationship between PLS and idea development through KS.
Table 4. The Moderating Effects of IM and EM on PLS-KA, PLS-KS Relationships.

<table>
<thead>
<tr>
<th>Variables</th>
<th>KA</th>
<th>KS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.003</td>
<td>0.001</td>
</tr>
<tr>
<td>PLS</td>
<td>0.212***</td>
<td>0.463***</td>
</tr>
<tr>
<td>IM</td>
<td>0.157*</td>
<td>0.087</td>
</tr>
<tr>
<td>EM</td>
<td>0.201**</td>
<td>0.044</td>
</tr>
<tr>
<td>PLS*IM</td>
<td>0.211**</td>
<td>0.211**</td>
</tr>
<tr>
<td>PLS*EM</td>
<td>0.133+</td>
<td>0.046</td>
</tr>
<tr>
<td>R²</td>
<td>0.175</td>
<td>0.186</td>
</tr>
<tr>
<td>F</td>
<td>9.753***</td>
<td>10.540***</td>
</tr>
</tbody>
</table>

Note: N=236. Standardized regression coefficients are reported. *** p<0.001, ** p<0.01, * p<0.05.

To test the moderated mediation, Preacher, Rucker & Hayes’s (2007) moderated mediation macro was adopted[30]. For Hypothesis 3a, we examined the conditional indirect effects of PLS on idea generation (through KA) at two values (one standard deviation above the mean, and one standard deviation below the mean) of IM and EM. Results are shown in table 5. When IM was low (no matter EM was low or high), a bootstrapped 95% CI around the indirect effect contained zero. When IM was high (no matter EM was low or high), a bootstrapped 95% CI around the indirect effect did not contain zero. Thus, hypothesis 3a was supported.

Table 5. Conditional Indirect Effects of PLS on Idea Generation via KA at Values of IM and EM.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>IM</th>
<th>EM</th>
<th>Effect</th>
<th>Boot SE</th>
<th>Boot LL95% CI</th>
<th>Boot UL95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>KA</td>
<td>-0.76</td>
<td>-0.85</td>
<td>-0.11</td>
<td>0.16</td>
<td>-0.43</td>
<td>0.22</td>
</tr>
<tr>
<td>KA</td>
<td>-0.76</td>
<td>0.85</td>
<td>0.30</td>
<td>0.30</td>
<td>-0.33</td>
<td>0.90</td>
</tr>
<tr>
<td>KA</td>
<td>0.76</td>
<td>-0.85</td>
<td>0.47</td>
<td>0.25</td>
<td>0.00</td>
<td>1.04</td>
</tr>
<tr>
<td>KA</td>
<td>0.76</td>
<td>0.85</td>
<td>0.88</td>
<td>0.27</td>
<td>0.42</td>
<td>1.51</td>
</tr>
</tbody>
</table>

Note: N=236. Bootstrap sample size=1000, LL=lower limit; CI=confidence interval; UL=upper limit.

For hypothesis 3b, we examine the indirect effects of PLS on idea development (through KS) two values (one standard deviation above the mean, and one standard deviation below the mean) of IM. Results are shown in Table 6. No matter IM was low or high, a bootstrapped 95% CI around the indirect effect did not contain zero. The indirect relationship between PLS and idea development via KS was more positive for individuals with high IM than individuals with low IM. Thus, the hypothesis 3b was partially supported.

Table 6. Conditional Indirect Effects of PLS on Idea Development via KS at Values of IM.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>IM</th>
<th>Effect</th>
<th>Boot SE</th>
<th>Boot LL95% CI</th>
<th>Boot UL95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>KS</td>
<td>-0.75</td>
<td>0.26</td>
<td>0.10</td>
<td>0.11</td>
<td>0.51</td>
</tr>
<tr>
<td>KS</td>
<td>0.75</td>
<td>0.56</td>
<td>0.11</td>
<td>0.37</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Note: N=236. Bootstrap sample size=1000, LL=lower limit; CI=confidence interval; UL=upper limit.

Discussion

Based on a process view of creativity, this paper examined how PLS affected idea generation, idea development. Initially, we predicted that knowledge acquisition, knowledge sharing mediated the PLS-idea generation, PLS-idea development relationships, respectively. We then examined if intrinsic and extrinsic motivations could synergistically moderate the indirect PLS-idea generation, PLS-idea development relationship. Study results supported our moderated mediation model.

We believe that our study makes two theoretical contributions at least. First, based on a process
view of creativity, we extend previous literature on PLS-creativity association by demonstrating the
effects of PLS on idea generation and idea development through different knowledge activity
mechanisms. This finding is important because it makes clear which knowledge activity should be
focused on in different phases of creativity. Second, our findings also contribute to the motivation
literature. This paper, to some extent, confirms the view of Amabile (1993) empirically. Recognizing
the relevance of both intrinsic and extrinsic motivation to creativity and their presence in any
individual, this research identifies both motivations as joint moderators of the PLS-idea generation
relationship.

For managerial implications, first, our results suggest that, for managers to promote employee idea
generation and idea development performance, they should exhibit supportive behaviors toward their
employees and their work. Second, our results also indicate that different knowledge activity should
be addressed at different stage of creativity. Third, our results show that internal motivation is much
more important than external motivation for those employees conducting creative tasks.

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