

The Moderating Effect of Bottleneck on the Relationship between Group Efficacy and Group Performance

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Abstract

While research has found the positive relationship between group efficacy and group performance, scholars have argued that this relationship is more complex than it seems. In this study, we propose that least competent group member is a moderator on this relationship. We argue that this member may play as a “bottleneck” of the group, which weakens the positive influence of group efficacy on group performance. Using data from 427 employees from 47 work groups in a manufacturing company in South Korea, we found that group efficacy is positively related to members’ perceptions of group performance, but not to actual group performance. Moreover, the relationship between group efficacy and its actual performance is moderated by group minimum of competency, which reflect the competency of the least competent member.

Introduction

Social cognitive theory (Bandura, 1997) holds that group efficacy, which refers to “a group’s shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments” (p. 477), enhances members’ work motivation. Supporting this theory, a meta-analysis demonstrated that group efficacy is positively related to group performance ($\rho = .39$) (Stajkovic, Lee, & Nyberg, 2009). Although the positive relationship between group efficacy and its performance seems to be straightforward, it is more complex than it seems. Indeed, scholars employed nuanced approaches on the relationship. The scholars have explored the contextual moderators in this relationship (see Stajkovic et al., 2009 for review) and found an inverted-U shaped relationship (Rapp, Bachrach, Rapp, & Mullins, 2014). However, it is unclear whether a distinctive member may affect this relationship.

The current study elucidates *when* the relationship differs. Specifically, we focus on an incompetent member who potentially hampers the group processes. To determine the least competent member, we employed group minimum of competency, which indicates the competency of the least competent member. Competency reflects the member’s organization-specific potential and ability, which predicts their performance and success in the organization (Bartram, Robertson, & Callinan, 2002; Stoof, Martens, Merrienboer, & Bastiaens, 2002). A high group minimum of competency indicates the least competent member of the group is not

necessarily a poor performer that impedes the group process. On the other hand, a low group minimum of competency shows that the group should have a significant bottleneck.

Theoretical Background and Hypotheses

According to the social cognitive theory (Bandura, 1997), group efficacy affects its performance both directly by improving members' work motivation, and indirectly by encouraging members to pursue more challenging goals (Locke & Latham, 1990). Based on this theoretical rationale, our first hypothesis is following:

Hypothesis 1. Group efficacy is positively related to (a) group performance as perceived by members and (b) actual group performance.

In regards to members' ability, generalized mental ability (GMA) has been frequently discussed. Bell's meta-analysis (2007) demonstrated that group members' GMA positively related to group performance. She found that the group maximum, group minimum and group mean of GMA are significantly related to group performance. However, the group minimum of GMA (i.e. GMA of the member with the lowest GMA within the group) is not significantly related to group performance among field studies where researchers have minimal latitudes for controlling situations. This means, GMA may not be the best indicator of group members' ability to perform their tasks in the organization, may interact with other factors, or both. In order to investigate these possibilities, we focus on the least competent member' competency.

Organizations value different employees' characteristics according to their unique circumstances. Scholars and practitioners highlighted the value of context-specific individual characteristics that directly contribute to the organizations' competitive advantages (Barney, 1986; Barney & Wright, 1998). Competency reflects individuals' potential and capability that are not necessarily limited to their behaviors that are considered to be desirable in the organization. Employees with high competency display skills, attitudes and behaviors that are considered to be effective in the organization (Mansfield, 1996). On the other hand, those with low competency may be far from an exemplar employee in the organization. In fact, these employees are perceived to be incompetent and even perform poorly.

Having an incompetent member in the group may weaken the positive relationship between group efficacy and group performance. In order to achieve high performance, the group should adopt high standards for their tasks and have capability to perform at that level. Indeed, group efficacy facilitates the members to set challenging goals and pursue them (Bandura, 1989). However, when there is an incompetent member who deteriorates the process of achieving the goals, group efficacy would not be sufficient to achieve high performance. This member may interfere the coordination of each individual's performance behaviors, which is essential for group performance. Thus, the relationship between group efficacy and its performance is weaker when group minimum of competency is high than low.

The research on social loafing further supports that the incompetent member may deteriorates productivity of the group (Kerr, 1983; Liden, Wayne, Jaworski, & Bennett, 2004; Schnake, 1991). When a member engages in social loafing, the other members reduce their work effort to avoid being taken for a "sucker" (Kerr, 1983; Schnake, 1991). This tendency does not necessarily occur when the member actually displays social loafing. Regardless of actual behavior, the perception of coworkers' social loafing influences members' motivation loss

(Mulvey & Klein, 1998; Liden et al., 2004). As such, when there is a member who contributes only little amount due to his or her low competency, the rest of group members are likely to reduce their work motivation. When the least competent member's competency is low, other members tend to have more complaints about this member's contribution and reduce their work effort even with group efficacy. On the other hand, when the least competent member's competency is still reasonably high, the rest of members are less likely to feel the member is free riding. Hence, we hypothesize the relationship between group efficacy and group performance differs according to the least competent member's competency.

Hypothesis 2. The competency of the least competent member within the group attenuates the positive relationship between collective efficacy and group performance as rated by group members.

Hypothesis 3. The competency of the least competent member within the group attenuates the positive relationship between collective efficacy and actual group performance.

Methods

Data collection

Data for this study were obtained from a manufacturing company in South Korea. The 462 employees in 52 work groups participated in the survey. All teams are considered to be traditional work teams that pursue the same group task goal and managed by the team leader. The response rate was 100%. We included the 427 employees from 47 intact work groups that have more than three members in the group in the analysis. Of the respondents, 96.9% were male and the average age was 32 years. In terms of the highest education level received, 61% reported a bachelor's degree and 16% reported a master's degree or higher.

Data were collected from multi-sources in three waves. First, team leaders evaluated their employees' competency. After 5 months, group members rated group efficacy and their own performance as a group. Finally, the upper-management assessed actual group performance based on organization-specific criteria after 7 months of the second wave.

Measure

Competency. Following Boyatzis's (1982) framework, the company has its own competency scale that reflects organization-specific characteristics. The immediate supervisor assessed their subordinates' competencies with a 5-point scale. The least competent member's competency is the group minimum of competency.

Group efficacy. Seven items of group efficacy were used ($\alpha = .84$). Group members responded in a 7-point scale.

Perceived group performance. Four items from Brannick, Salas, and Prince (1997) were employed to measure member-rated group performance ($\alpha = .85$). Group members responded in a 7-point scale.

Actual group performance. The company has its own measure for evaluating group performance. The criteria for team performance included fulfillment of tasks, completion of projects, and degree of innovation. The upper-management rated each group's performance with this measure. The ratings range from 0 to 100 points.

Control variables. We controlled two variables that are theoretically linked to the relationships of interest (Carlson & Wu, 2012). According to the social cognitive theory (Bandura, 1997), the past performance and capability for performing tasks are relevant to members' efficacy. As such, we controlled group mean of competency, which reflects the average level of members' competency, and group performance of the previous year.

Data Analysis

The variables of interests were rated in different scales and potentially have multicollinearity between variables. To alleviate these issues, we standardized the variables. Moreover, we aggregated each member's subjective ratings of group efficacy and group performance to form measures for each group. In order to justify the aggregation, we assessed within-group agreement, r_{wg} . Group performance was indexed as the average ratings of group performance across the members of each team and exhibited a high degree of $r_{wg} = .85$. Similarly, group efficacy was aggregated by the members of each team and exhibited a high degree of $r_{wg} = .93$.

Results

Table 1 presents the means, standard deviations, and correlations among the variables of interest.

Table 1. Means, Standard Deviations, and Correlations among Study Variables

	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Previous year's actual group performance	76.83	11.36					
2. Group mean of competency	3.97	.18	-.09				
3. Group efficacy	5.74	.46	.25	-.03			
4. Group minimum of Competency	3.58	.38	-.02	.77**	.10		
5. Perceived group performance	5.26	.66	.65**	-.05	.56**	.17	
6. Actual group performance	90.70	10.76	.31	.01	.05	-.01	.23

Note. $N=47$. * $p < .05$, ** $p < .01$

Hypothesis 1 proposes a positive relationship between group efficacy and group performance. As shown in Model 2 in Table 2 and 3, group efficacy was significantly related to perceived peer-rated group performance ($\beta = .53$, $p < .01$). However, group efficacy was not significantly related to actual group performance ($\beta = .01$, *n.s.*). These results indicate that high group efficacy promotes members to have a favorable evaluation on their own performance, even though it does not actually improve actual group performance.

Table 2. Results of the Relationships Between Group efficacy, Group Minimum of Competency, and Group Performance as perceived by members

Variables	Model1	Model2	Model3	Model 4
Step 1: Controls				
Previous year's actual group performance	.656**	.520**	.519	.511**
Group mean of competency	.027	-.046	-.058	-.081
Step2: Main effect				
Group efficacy		.530**	.527**	-.426
Group minimum of competency			.016	-.914
Step 3: Moderating effect				
Group efficacy*Group minimum of competency				1.494
Overall F	10.864**	20.465**	14.807**	11.798**
R^2	.428	.687	.687	.694
F change	10.864**	23.105**	.009	.612
R^2 change	.428	.258	.000	.007

Note. N=47. * $p < .05$, ** $p < .01$

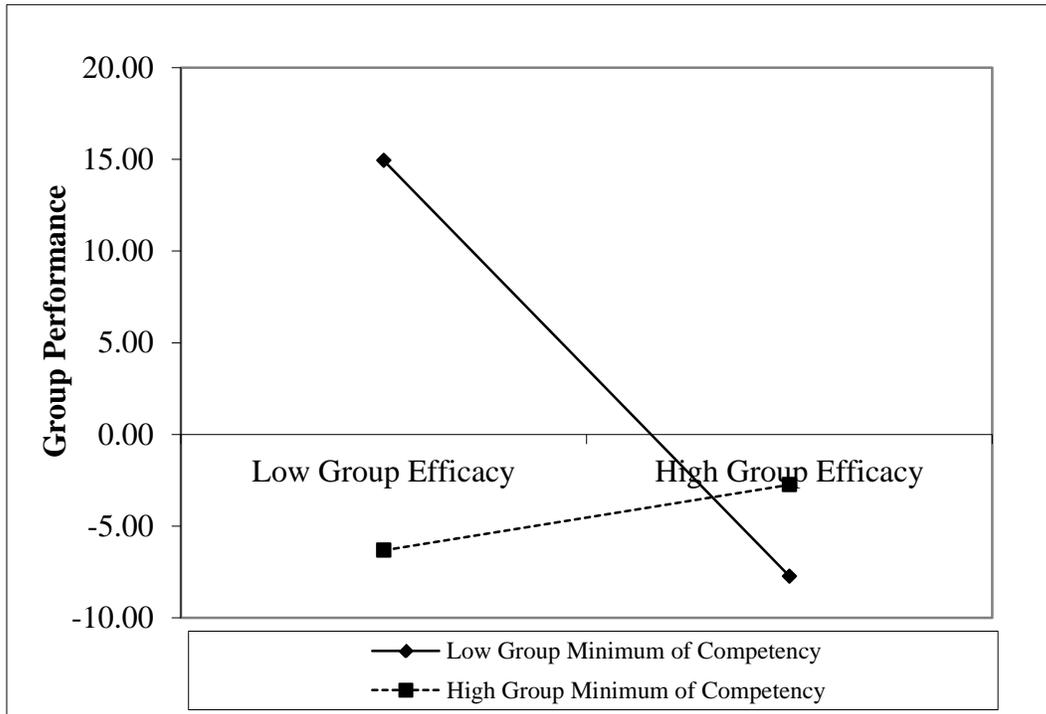
Table 3. Results of the Relationships Between Group efficacy, Group Minimum of Competency, and Actual Group Performance

Variables	Model1	Model2	Model3	Model 4
Step 1: Controls				
Actual group performance (Previous year)	.332 [†]	.330 [†]	.332 [†]	.295 [†]
Group mean of competency	.185	.184	.232	.131
Step2: Main effect				
Group efficacy		.008	.017	-4.016 [*]
Group minimum of competency			-.065	-4.019 [*]
Step 3: Moderating effect				
Group efficacy*Group minimum of competency				6.318 [*]
Overall F	2.088	1.343	.984	1.777
R ²	.130	.130	1.31	.262
F change	2.088	.002	.050	4.428 [*]
R ² change	.130	.000	.002	.131

Note. N=47. [†]p<.10, ^{*}p<.05, ^{**}p<.01

Hypothesis 2 suggests the moderating effect of the least competent member's competency on the relationship between group efficacy and performance. The results in Model 3 in Table 2 show that the interaction between group efficacy and the group minimum of competency is not significant for predicting group performance rated by group members ($\beta = 1.49, n.s$). On the other hand, as shown in Model 3 in Table 3, the least competent member's competency moderates the relationship between group efficacy and actual group performance rated by the upper management ($\beta = 6.32, p < .05$). The Figure 1 illustrates the nature of interaction effect. While the relationship is positive when the least competent member's competency is high, the relationship is negative when the least competent member's competency is low. Additionally, we conducted the simple slope test to examine whether the relationship between group efficacy and group performance is significant when the group minimum of competency is high and low. The results indicate that the impact of group efficacy on actual group performance is significant when the competency of the least competent member is low ($t = -2.09, p < .05$), and high ($t = 2.08, p < .05$).

Figure 1. The moderating effect of group minimum of competency on the relationship between group efficacy and group performance



Discussions and Conclusion

The current study proposes that the relationship between group efficacy and group performance differs according to the least competent member’s competency within the group. Supporting the social cognitive theory (Bandura, 1997), the results indicate that group efficacy is positively related to group performance that perceived the members. Even when the group has a member who is incompetent and may worsen group functioning, the positive impact of group efficacy on group performance that was perceived by members is intact.

However, the influence of group efficacy on actual group performance is only significant when the group competency is taken into consideration. Specifically, while the influence is positive when the group minimum is high, it is negative when the group minimum is low. A high group minimum of competency indicates that the least competent member in the group is not necessarily an incompetent employee. When the group has high group efficacy, which encourages the group to set challenging goals and pursue the goals, this least competent member would not necessarily hamper the process of achieving these goals. As such, the group without a bottleneck would be benefited from group efficacy in improving group performance.

On the contrary, this relationship becomes negative when the least competent member is actually incompetent (i.e. group minimum of competency is low). This unexpected result indicates that group efficacy may backfire group performance when the group has a serious bottleneck. Although this result contradicts the majority of research based on social cognitive theory (Bandura, 1997), perceptual control theory (Powers, 1973, 1991) provides a theoretical rationale of why group efficacy can be negatively related to its performance. This theory

assumes that the discrepancy between individuals' current state and their desired state derives their motivation. Individuals with high self-efficacy belief tend to have an optimistic view on their current state and therefore perceive a small gap between their current state and their desired state. As such, individuals with high self-efficacy may actually invest less resources (e.g. time or effort) for completing their work. Supporting this notion, empirical studies have found that self-efficacy leads overconfidence, which has negative impact on their actual performance behaviors (Vancouver, Thompson, & Williams, 2001; Vancouver, Thompson, Tischner, & Putka, 2002). Moreover, efficacy beliefs lead high performance only if actors are actually competent. Efficacy beliefs promote individuals to set a high standard at work. However, if they are not actually capable to perform at that level, the performance may even decrease (Powers, 1991). When the group has low group minimum, which indicates that the least competent member in the group actually interferes the work process, high group efficacy may have a negative impact on group performance. That is, although group efficacy motivates the group members to set a challenging goal, the group may have difficulties in achieving it.

Implications

This study improves our understanding on groups. First, the results on the impact of the least competent member in the group provides us an insight how groups function. A rich body of research shows that members' characteristics such as personalities, ability and values are relevant to group performance (Bell, 2007). However, the majority of the research relies on the group mean or median, assuming that individual member's characteristics contribute equally to the collective pool of the group characteristics. Although this approach captures the general estimate of the group, a more nuanced approach that illuminates how a conspicuous member affects the group work has rarely employed (Barrick, Stewart, Neubert, & Mount, 1998; Steiner, 1972). By illustrating the impact of incompetent member on group outcomes, the current study enhances our understanding of how to manage a work group. When managers construct their teams, they particularly pay attention to each individual member, particularly, the one who has low competency.

Second, finding different patterns for subjective and objective ratings of group performance in conjunction with group efficacy adds value to the literature on groups. The results indicate that group efficacy does not guarantee the quality of group outcomes. Indeed, it may have a negative impact on group performance when the group has a 'bottleneck'. To manage a work group effectively, the supervisor needs to consider both efficacy and members' competency.

Limitations and Future Research

This study is not without limitations. First, the generalizability of our results is limited because the results were yield from one organization. Second, the mechanisms explaining the relationship between group efficacy and group performance were not measured. Although social cognitive theory suggests that group efficacy promotes members' work motivation that determines group performance, we did not measure members' motivation. The future study may explore mediators on the relationship between group efficacy and performance and how they interact with group minimum of competency. Third, this study did not include the task characteristics into considerations. Steiner (1972) suggested that different group configurations

of members' ability determine different types of group performance. Specifically, the group minimum is crucial for conjunctive tasks where a bottleneck slows down the whole process. With his taxonomy of group task, the future research may provide a more detailed dynamics on how group members work together.

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