Team Collaboration and Competition
Leadership Issue of Knowledge Management

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Abstract: Recent research suggests that there are two distinct behavioural components of leadership: 1) those targeted at influencing the group as a whole (group-focused); and 2) those aimed at individual group members (individual-focused). Differentiated individual-focused leadership occurs when leader exhibits varying levels of individual-focused leadership behaviour across different group members. This research examines the unique influences of group-focused empowering leadership and differentiated individual-focused empowering leadership on RandD team's processes and team effectiveness. Using data from 54 RandD teams, we found that group-focused empowering leadership is strongly related to intra-team collaboration, which in turn substantially benefits both team creativity and performance. Differentiated individual-focused empowering leadership, however, leads to intra-team competition, which is harmful to team creativity.

1 INTRODUCTION

The leadership of RandD teams has been reported to be an important factor contributing to various outcomes such as individual and group innovation, project and employee performance, RandD project effectiveness, and team performances. RandD teams are characterized with considerable more autonomy than other types of teams: they typically have greater degree of freedom in day to day operating decisions such as when to work and how to solve job problems (Abbey and Dickson, 1983; Stoker et al., 2001). To address the autonomous nature of RandD activities, empowering leadership is increasingly discussed to be positively related to RandD team effectiveness as it provides a balance between autonomy and control, encourages member participation as well as self-leadership, and benefits creativity (Faraj and Sambamurthy, 2006; Frischer, 1993).

Recent research points out that leaders can attend to both team and individual members (Chen, Kirkman, Kanfer and Allen, 2007; Wu, Tsui, and Kinicki, 2010). Thus, there are two distinct behavioral components of leadership: 1) those targeted at influencing the group as a whole(e.g., setting goals for the whole group, and provide inspiration for the whole group); and 2) those aimed at individual group members(e.g., setting goals for individual members, and providing individualized coaching). The former is called group-focused leadership, while the latter is termed individual-focused leadership. Differentiated individual-focused leadership occurs when leader exhibits varying levels of individual-focused leadership behaviour across different group members, for example, treating some members better than others; or providing more support to some members than others. A critique question concerning differentiated leadership is whether it is beneficial or detrimental to team effectiveness. Wu et al.(2010) reported that differentiated individual-focused transformational leadership harms group effectiveness through self-efficacy divergence. However, much is still left unexplored. For example, what are the effects of differentiated individual focused empowering leadership on other team outcomes, such as performance and creativity, and through what mechanism?

To advance this line of research, the current research aims to investigate empowering leadership in RandD teams through the lens of group-focused and differentiated individual focused leadership, and the mechanism through which they affect team effectiveness in the forms of team creativity and performance. We examine how group-focused and

differentiated individual focused leadership influence team creativity and performance through internal team processes, i.e. intra-team competition and collaboration.

2 THEORY AND HYPOTHESES

Based on the input-process-output model, the heuristic model of team effectiveness (Cohen and Bailey, 1997) suggests that team effectiveness is a function of contextual factors and group processes, among others. Supervising and leadership behaviour serves as a contextual factor and influences team processes (e.g., conflicts, collaboration and communication), which in turn, leads to team effectiveness such performance and creativity.

We propose empowering leadership behaviour as the contextual factor in our model. An empowering leader consults with and makes joint decisions with team members and delegates responsibilities to team members, encourages team members' active participation and self-leadership, and encourages followers to actively provide input, participate in team decisions, and display initiative(Faraj and Sambamurthy, 2006). Extending prior work by Pearce and Sims (2002), Faraj and Sambamurthy (2006) defined empowering leadership in the RandD context to consist of three dimensions: encouraging teamwork, encouraging self-development, and participative goal setting. These three dimensions can be then categorized into two types: group-focused empowering leadership, and differentiated individual-focused empowering leadership. Group-focused empowering leadership refers to activities that are aimed at influencing the team as a whole. For example, encouraging teamwork and providing vision for the whole team. Differentiated individual-focused empowering leadership, however, describes leader treating members differently in individual-focused activities such as providing resources/
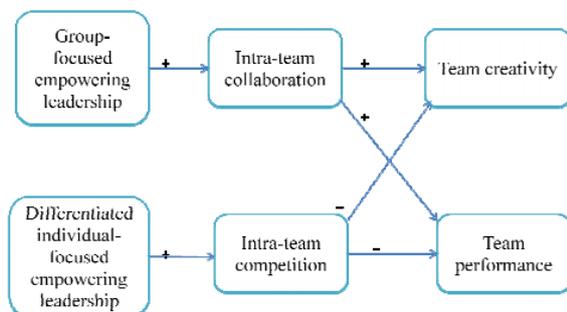

Figure 1: Proposed research model.

support, and encouraging individual learning. The contextual factor of empowering leadership induces team processes, defined as the interaction pattern among team members (Jehn and Shah, 1997). In this research, we focus on two specific forms of team processes: intra-team competition and collaboration. These processes, accordingly, lead to different team outcomes, such as team creativity and performance. Figure 1 below delineates the proposed research model.

2.1 Group-Focused Empowering Leadership

Group-focused leadership sets its influence target as a whole group, rather than individual members within the group. For the team as a group, leaders can direct the team as a whole and influence team outcomes by leadership activities such as setting shared team goals and providing team rules and guidance. Empowering leadership focuses on member participation and self-management (Manz and Sims, 1987), and encouraging teamwork is an important aspect of empowering leadership as closer teamwork enhances the ability of a team's self-management(Pearce and Sims, 2002). Encouraging teamwork, as one dimension of empowering leadership is likely to influence a team as a whole because of its emphasis on common ground, shared values, and ideology. Empowering leaders encourage teamwork by urging the whole team to work together as a team and coordinate efforts with each other(Pearce and Sims, 2002). Thus, in this study, we refer to encouraging team work as group-focused empowering leadership.

Theory of Reasoned Action suggests that subjective norms and attitudes can influence one's behavioural intentions, and subsequently, the actual behaviour (Ajzen and Fishbein, 1975). Relatedness, i.e., the need for social connection and intimacy, is one of the three core psychological need of human being (Gagne and Deci, 2005). Collaboration with other team members can provide fulfilment of the need of relatedness. Therefore, it is likely that people have initial positive attitudes toward collaboration. Moreover, as group-focused empowering leadership emphasizes the importance of the team to work together as an entity and coordinate efforts with each other, team members likely embrace teamwork as a subjective norm, i.e. a perceived expectations to perform what is expected from relevant individuals or groups (Ajzen and Fishbein, 1975).

We then propose:

Hypothesis 1. Group-focused empowering leadership is positively related to intra-team collaboration

2.2 Differentiated Individual-Focused Empowering Leadership

Differentiated individual-focused empowering leadership, however, captures the variation of individual-focused leadership among team members (Wu et al., 2010). A high level of differentiated leadership signifies that the leader treat different members differently. For example, instead of treating all members as the same, the leader may encourage some members to seek new opportunities to grow more often than other members. Or, the leader may sit with some members and discuss their performance goals with them, but give directive orders to others as far as performance goals are concerned. Low levels of differentiated leadership, on the contrary, suggest that the leader provides similar level of participation and support for development for each team member. Sherony and Green (2002) found that coworker relationship quality increased as coworkers' similarity in leader-member-exchange (LMX) quality grew and decreased as similarity in LMX diminished. Within-team differentiated leadership results in the formation of sub-groups in teams: an in-group and an out-group, with the former enjoying a better relationship with the leader. Social psychologists argue that the in-group may seek positive distinctiveness through direct competition with the out-group; while the out-group may try to reverse the relative positions of the in-group on salient dimensions (Tajfel and Turner, 1979; p44). As a result, higher differentiated individual-focused empowering leadership may lead to higher levels of intra-team competition. Thus, we propose:

Hypothesis 2a: Differentiated individual-focused empowering leadership in encouraging self-development is positively related to intra-team competition

Hypothesis 2b: Differentiated individual-focused empowering leadership in participative goal setting is positively related to intra-team competition

2.3 Intra-Team Collaboration and Team Effectiveness

We focus on team creativity and team performance as two measures of team effectiveness in the RandD

context. Collaboration supports all three components of creativity: expertise, creative-thinking skill and intrinsic task motivation (Amabile, 1988). Creativity is spurred when diverse ideas are united or when creative material in one domain inspires or forces fresh thinking in another (Uzzi and Spiro, 2005). These structural preconditions suggest that creativity is the consequence of a social system of actors that amplify or stifle one another's creativity. We thus expect that intra-team collaboration directly enhances team creativity. The whole team's performance also benefits as in a collaborative team environment. When team members collaborate toward a common goal, perceptions of shared fate is created and supportive behaviour is promoted, whereby each group member looks out for the interests of the others. We thus propose:

Hypothesis 3a: Intra-team collaboration is positively related to team creativity

Hypothesis 3b: Intra-team collaboration is positively related to team performance

2.4 Intra-Team Competition and Team Effectiveness

In RandD teams, each member's work is dependent on the others. For overall performance and successful project integration, both intra-team and inter-team collaboration are vital (Hoegl et al.,2004; Souder and Moenaert, 1992). Intra-team competition, on the contrary, may be detrimental to RandD team effectiveness. Rather than share information and experience, people in competitive teams tend to keep valuable information proprietary. Moreover, rather than supporting each other, people in competitive environments may be motivated to impair the progress of others in an effort to gain positive advantage. Teammates are likely to remain indifferent to one another and avoid interacting for fear that doing so will result in exploitation (Tjosvold, 1986). The possibility also exists for teammates to interfere, obstruct, or in some other way make the behaviour of another less effective (Tjosvold, 1986). Thus, intra-team competition may have negative influences on team effectiveness in both creativity and performance.

Hypothesis 4a: Intra-team competition is negatively related to team creativity

Hypothesis 4b: Intra-team competition is negatively related to team performance

3 METHODS

3.1 Sample and Procedures

We tested the model and hypotheses with data collected from a cross-sectional field study of employees in RandD departments from a system integration company headquartered in Taiwan. This company has frequented the Business week's Infotech 100 list and is one of the world leaders in desktops, notebooks, motherboards and other computer related products. For this survey, participants include software engineers, system engineers, hardware engineers, and RandD managers located in the Taipei headquarter office. With the support from top management teams and the help of two administrative assistants, roughly 100 RandD teams in the headquarter office were invited by mail to participate in the survey with the offer of a small gift. Fifty-five teams responded, with 247 engineers and 55 managers from the motherboard business unit and the handheld device business unit. Two forms of surveys were used. RandD engineers answered questions about their perceptions of empowering leadership, intra-team competition and collaboration. RandD managers assessed their team's performance and creativity. Surveys were given to the team manager to hand out to his/her members, and engineers returned their finished survey to their managers in sealed envelopes, with no identification information on them. A total of 247 engineers and 55 managers' responded, however, one survey come back with incomplete data. Table 1 summarizes the demographic information of the sample.

Table 1: the demographic information of the sample

	Manager	RandD engineer
Gender	female (16.7%), male(83.3%)	female(16.8%), male(83.2%)
Tenure	average 6.06 yr (1.4-13.4)	average 3.1 yr (0.1-11)
Team size	average 7 (3-17)	
Education		College (42.9%) Masters (52.1%)
Age		20-30 yr (47%), 30-40 yr (52.5%)

3.2 Measures

Group-focused Empowering Leadership: Group-focused empowering leadership measurements are from Faraj and Sambamurthy (2006)'s empowering leadership measurement of encouraging teamwork with 5 items. Wording of the items was adjusted to reflect team referent (e.g., "My team leader encourages us to work together with each other who are part of the team"). Measures use a scale anchored at 1("strongly disagree") and 7("Strongly agree"). Because intra-team collaboration is a group-level variable, individual level data need to be aggregated to the group level for analysis (James, 1982; Glick, 1985).

Differentiated Individual-focused Empowering Leadership: Differentiated individual-focused empowering leadership has two dimensions: differentiation in encouraging self-development and differentiation in participative goal setting. Encouraging self-development and participative goal setting were from Faraj and Sambamurthy (2006)'s empowering leadership measurement. Measures use a scale anchored at 1("strongly disagree") and 7("Strongly agree").

Intra-team Competition: Intra-team competition is measured using within school competition scale from Mael and Ashford(1992). The original scale was developed to measure perceived competition among students attending the same school, and some items may not be readily applied in the work setting. Thus, the wording of the scale was modified to fit the working context. Group-level variables are measured using individual respondents and aggregated to the group level.

Intra-team Collaboration: The measures of intra-team collaboration blended prior research from several scholars into one scale. It synthesizes scale items used in Aram and Morgan (1976) for collective problem solving, Singh and Avital (2007) and Baggs (1994) for information sharing, Aram and Morgan (1976) for help and support, Lin et al., (2010) for collaborative working, and last, Singh and Avital (2007) for task coordination. The scale reflects the wilful contribution of personal effort, knowledge and resources to the completion of tasks of other team members towards common goals.

Team Performance: Team performance was from Faraj and Sambamurthy (2006). We use a 1–5 scale, ranging from well below average to well above average. We asked team managers to assess the performance of their own team and compare their team with other RandD teams with which they were familiar.

Team Creativity: Team creativity was measured with Lovelace, Shapiro and Weingart (2001)'s 4 items with a 1–5 scale from well below average to well above average. This too, was assessed by team managers of their own teams against other RandD teams with which they were familiar with.

Table 2: Means, standard deviations, correlations among the variables, and reliabilities for the measures.

	Mean	SD	1	2	3	4	5	6	7
1.Group-focused empowering leadership	5.97	0.47	(0.96)						
2.Differentiated individual-focused leadership: encouraging self-development	0.13	0.07	-.453**						
3.Differentiated individual-focused leadership: participative goal setting	0.17	0.11	-.450**	.418**					
4.Intra-team collaboration	5.88	0.47	.732**	-.329*	-.357**	(0.92)			
5.Intra-team competition	3.61	0.62	-.312*	.334*	.028	-.418**	(0.72)		
6.Team performance	3.59	0.53	.246	-.120	-.098	.303*	-.085	(0.76)	
7.Team creativity	3.41	0.61	.326*	-.288*	-.059	.394**	-.167	.539**	(0.76)

N= 54 teams. *p<0.05, **p<0.01

Table 3: Results from the regression analysis for hypothesis testing.

variable	Hypothesis 1 intra-team collaboration	Hypothesis 2a intra-team competition	Hypothesis 2b intra-team competition	Hypothesis 3 team creativity	Hypothesis 3 team performance	Hypothesis 4 team creativity	Hypothesis 4 team performance
reward structure				0.25*	0.06	0.28***	0.03
manager tenure				0.04	0.08	0.10	0.13
team history				0.60***	0.40***	0.64***	0.42***
team size				-0.01	-0.14	-0.00	-0.13
Group-focused empowering leadership	0.74***						
Differentiated individual-focused leadership: encouraging self-development		0.35**					
Differentiated individual-focused leadership: participative goal setting			0.06				
Intra-team collaboration				0.34**	0.28*		
Intra-team competition						-0.25*	-0.15
R square	0.55	0.15	0.03	0.56	0.28	0.51	0.23
F	12.10***	2.70+	0.29	12.19***	3.8***	10.06***	2.85*

N= 54 teams. +p<0.1, *p<0.05, **p<0.01 ***p<0.001

4 PRELIMINARY RESULTS

The means, standard deviations, correlations among the variables, and reliabilities for the measures are reported in Table 2.

4.1 Hypotheses Testing

All hypotheses were tested using ordinary least squares(OLS) regression. Table 3 reports the results from the regression analysis for our hypothesis testing.

Hypothesis 1 predicts that group-focused empowering leadership is positively related to intra-team collaboration. As column 2 in Table 3 shows, group-focused empowering leadership is strongly and positively related to intra-team collaboration (coefficient=0.74), thus, hypothesis 1 is supported.

Hypothesis 2 states that differentiated individual-focused empowering leadership in encouraging self-development and participative goal setting is positively related to intra-team competition. Column 3 and 4 in Table 3 show the results. While differentiated individual-focused leadership in encouraging self-development is positively related to intra-team competition, differentiated individual-focused empowering leadership in participative goal setting isn't. Thus, Hypothesis 2 is partly supported

Hypothesis 3 argues that Intra-team collaboration is positively related to team creativity and performance. As column 4 and 5 in Table 3 shows, intra-team collaboration is positively related to both

team creativity (coefficient 0.34) and performance (coefficient 0.28), thus, hypothesis 3a and 3b are fully supported.

Hypothesis 4 maintains that intra-team competition is negatively related to team creativity and performance. Column 6 and 7 summarize the results. Intra-team competition is indeed negatively related to team creativity, however, its negative association with team performance failed to be significant. Therefore, hypothesis 4 is also partly supported.

5 DISCUSSION AND CONCLUSION

In this study, we took a closer look at empowering leadership through the group-focused and differentiated individual-focused lens, and found that although empowering leadership as a whole is positively related to team effectiveness (Faraj and Sambamurthy, 2006), details concerning how it is administered can also make a huge difference in outcomes.

5.1 Theoretical Implications

Prior research has mostly treated empowering leadership as a single construct with different dimensions. This research explores the two distinct behavioural components of empowering leadership: 1) those targeted at influencing the group at a whole; and 2) those aimed at individual group members, and further investigate the results of differentiated individual-focused leadership. The findings reveal that for those two types of empowering leadership behaviours, different team processes could follow. Thus, we contribute to the empowering leadership literature with further details and insights concerning each dimension, and the proper use of individual-focused leadership with the group-focused and differentiated individual-focused lens. Second, this research extends our understanding of how RandD team leaders influence team creativity and performance through creativity-enabling or hindering group processes. We investigate a pair of important, albeit little-discussed team processes: intra-team competition and collaboration. We explore how leadership behaviours, although unintended, may lead to unwanted group process of intra-team competition as an outcome, and how intentionally focusing on the team as a whole could lead to better team process in the form of collaboration. We also examine the different outcomes of team processes on team creativity and performance, substantiating the heuristic model of team effectiveness (Cohen and Bailey, 1997).

5.2 Managerial Implications

This research offers interesting insights and implications for RandD managers that intend to use empowering leadership for their teams.

First, group focused leadership that emphasizes teamwork enhances team collaboration, and team collaboration is vital for both team creativity and team performance. Thus, managers that want to empower their teams should first and foremost stress the importance of teamwork and collaboration, which would substantially enhance their team creativity and performance.

Second, encouraging self-development is an effective tool for empowering the team; however, managers should use this tool with caution. When managers encourage team members for self-development, they should make sure that each member feels like he/she has been treated equally with other members. Managers should not display favouritism towards some members out of the whole team, especially on salient, open topics such as learning opportunities and skill development. Each member deserves his/her own chance to learn and grow. Otherwise, knowing that someone is getting more than others, team members are likely to compete with each other for more and better opportunities, thus directly hurting team creativity. Intra-team competition, as the bivariate correlation shows, is also negatively related to collaboration, thus, doubling the harm.

Third, this research outlines the potential harmful influence of competition in RandD teams. Many people believe competition promotes efficiency and innovation as it stimulates individuals to outperform each other by working faster, or "smarter," or cheaper (Fletcher, Major, and Davis, 2008). However, results from our study show that instead of enhancing team performance and creativity, competition among team members actually hampers creativity, and can potentially harm performance as well. Thus, managers should avoid creating a competitive environment for their teams whenever possible. While competition can be effectively used in some other industries, due to the interdependence nature of RandD work, using competition to motivate team members for better outcomes may fail miserably.

To summarize, the key point from this research

is: empowering is good, when it is done equally. As far as empowering team members are concerned, leaders should be advised that differentiation between treatments of team members hampers team creativity and performance, and should be avoided when possible. Managers should treat all members equally in encouraging self-development and participative goal setting, not favouring one over another for better team performance and creativity.

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