

The moderating effect of LMX and LMX differentiation on the relationship of team coaching and team effectiveness

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Abstract

Coaches help people perform well. Previous research has examined coaching in individual level. In “The theory of Team Coaching”, Hachman & Wageman posited the team coaching functions are positively related to team performance processes and then foster team effectiveness. Also, team coaching is a leadership behavior. The exchange quality between team leader and members (LMX) may influence the effects of team coaching functions on team effectiveness. The purpose of this research is to examine the moderating effects of LMX quality and LMX differentiation on the relationship between team coaching functions and team effectiveness. We drew our sample from R&D teams of high-tech industries in Taiwanese Science Parks. All analyses were conducted at the team level. Mean LMX quality within a team will enhance the effect of team coaching on team effectiveness. But LMX differentiation within a team can not foster the effects of team coaching on team effectiveness. The results are discussed concerning the implications for both team coaching and LMX theory.

Keywords: Team Coaching, LMX, LMX Differentiation, Team Effectiveness

1 Introduction

In response to high level of intense competition and economic uncertainty, numerous firms have adopted team-based structures to survive and gain competitive advantage(Gibson & Shally, 2004; Sundstrom,1999). It has been argued that in many circumstances, teams are more effective than individuals because team members can share workloads, monitor their teammates’ behaviors, and contribute their different areas expertise(Mathieu, Heffner, Goodwin, Salas, Cannon-Bowers,2000). Given the potential benefits of teamwork to intense competition, it is important to examine how teams operate effectively to improve team effectiveness.

According to the study of Zaccaro & Klimoski(2002) , there are characteristics in effective team performance, including: 1.team members have the capabilities to coordinate individuals’ actions successfully; 2.information input and the capabilities of team members adaptive to changing and complicated environment; 3.team leadership. Cohen & Bailey(1997), Hackman & Walton(1986) proposed that leadership is an important factor for

fostering team effectiveness. Sinclair(1992) , Zaccaro, Rittman, & Marks(2001) also posited team leadership is the key to enhance team effectiveness. In teamwork context, team tasks are accomplished by team members. Team leader's leadership style will influence the behaviors of team members, so as to team effectiveness.

In this sense, team coaching is a leadership behavior. High LMX relationship is characterized by respect, trust, and mutual obligation(Graen & Uhl-Bien,1995) . High LMX fosters team outcomes. Furthermore, it is important to note that leadership style of team leader in team and LMX can operate concurrently. Usually team member's individual work is interdependent to each others to accomplish team task. The importance of individual job of team member's depends on the capabilities owned by team members that are required for team tasks. As Brass(1995) suggested that leaders do not have time to perform high-quality relationships will all of the team members. Team leader may treat members the same on certain dimensions and differently on other dimensions.

High LMX differentiation within team may not always be detrimental to team functioning(Boies & Howell,2006). In their study within-team, mean LMX interacted with LMX differentiation to explain team potency and team conflict. The relationship between mean LMX with team outcomes were stronger when LMX differentiation within-team is high than low. When team members perceived differentiated relationships with their leader, mean LMX within the team matters.

In Liu, Pirola-Merlo, Yang, and Huang(2009) study, the results showed team coaching functions are positively related to team performance and then team effectiveness. Since team coaching is in essence a leadership behavior, high LMX relationship are characterized by respect, trust, and mutual obligation(Graen & Uhl-Bien,1995). In this study we aim to test the interaction effects of mean LMX and LMX differentiation within-team on the relationship between team coaching and team effectiveness. The main contribution of this study is to clarify what's the optimal LMX fashion in team based on previous team coaching and LMX studies.

2. Literature Review and Hypotheses

2.1 The moderating effect of Mean LMX

Leadership is a multilevel phenomenon. It happens between at least two persons: a leader and a follower. This relationship can be in broader context, be it a group, a department, or an organization. The leader-member exchange theory derived from what was originally called the vertical-dyad linkage(Dansereau, Graen, & Haga,1975). LMX theory is the only leadership theory to explain the vertical-dyad exchange relationship between leader and followers(Gerstner & Day, 1997). Previous studies showed the leader member exchange quality is the good predictor for employee's performance(Gerstner & Day, 1997; Graen & Uhl-Bien,1995). Under high LMX quality, the leader and members will trust, respect and mutual obligation on work and interact with each other, therefore the leader influence the behavior and perception of followers. However, in low LMX quality situations, work is performed according to a set of rules and employment contract; information is communicated downward, and relationships are characterized by long distance between leader and members. Graen, Orris, & Johnson(1973) found high LMX quality within team, team members' perception of team climate is similar to team leader's and other team members' perception. Previous studies show that LMX quality is one of the key factor for the nature and strength of shared team climate (Hofman & Morgeson, 1999; Hofman, Morgeson, & Gerras, 2003; Zohar, 2002; Zohar & Luria, 2004).

Although LMX theory is originally conceptualized and tested at the dyadic level (e.g., Schriesheim, Neider, & Scandura, 1998), it does not exclude interpretation from higher level of analysis (Cogliser & Schriesheim, 2000). Since team-based organizations are popular in intensive competitive environment, the relationship quality between team leader and members is therefore important.

In a sense, team coaching is a leadership behavior. High LMX in team is characterized by respect, exchange information, mutual commitment. Therefore team members may feel more empowered and be able to tackle their tasks. This in turn may influence members' sense of self-efficacy. Consequently, that increases the level of effort, skill and knowledge of team members, and also makes team members applying appropriate strategies on team tasks accomplishment. According to the study of Kanter (1988), innovators need the information (including data and profession), resources (including time, space, and materials), and social-political support from leader to develop, protect and apply their innovation ideas. The study of Boies & Howell (2006) showed LMX quality in team is positively related to team potency. Therefore we proposed:

Hypothesis 1: LMX quality will moderate the relation between team coaching and team effectiveness. The relation between team coaching and team effectiveness will be stronger for high LMX teams than for low LMX teams.

2.2 The moderating effect of LMX differentiation

LMX represented a departure from the previous average leadership style theories by proposing that leaders do not treat all followers identically, rather they develop different relationship quality with the followers based on the leaders' limited time and resources. Furthermore, the contributions of team members' individual works to tasks accomplishment are not identical but interdependent, team leaders have to devote their limited time and resources toward the key team members. Therefore, the relationship between team leader and each member is not identical, LMX differentiation (LMXD) within team is normal in teamwork context. By maintaining good quality relationship with team leader, the key member will get encouragement, support and information from the leader, which will help task accomplishment. From the perspective of equity, even higher LMXD will make team members feel inequality within team. But in R&D teams, task is interdependent in nature. Usually team members really understand who the key persons are for task accomplishment. Any individual member who contributes less for team task accomplishment thus can be willing to support the key person's work to enhance team performance. This situation will help to reduce the feeling of inequality. To keep different relationships with team members for team leader will help team task accomplishment. For the members within the focal team, any contributions to team performance will also help for individual performance. Follow the characteristic of task interdependent of R&D teams, we proposed:

Hypothesis 2: LMX differentiation within team will moderate the relation between team coaching and team effectiveness. The relation between team coaching and team effectiveness will be stronger for high LMX differentiation teams than for low LMX differentiation teams.

We can summarize by providing our hypothesized model as below:

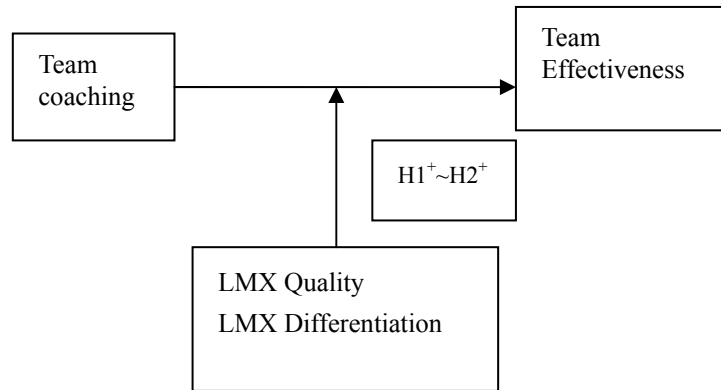


Fig.1 Research Framework

3 Methodology

3.1 Sample

The government of Taiwan launched a six-year (from 1991 to 1996) development plan to push Taiwan into a key R&D center in Asia and began to establish several Science Parks for high-tech industries. This research aimed at high-tech industry in Taiwan Science Park. Any high-tech company wants to set in Science Parks need to have R&D teams in the organization. Taiwan high-tech industries face fiercely competitive environment and shrinking product life cycles. Consequently, they need to develop new products or enhance production processes to rapidly reduce production costs. R&D teams are basic organizational structure in the Taiwanese high-tech industry. Normally, the identities of team members depend on the tasks involved, with professionals capable of completing the required tasks being recruited to the team. Teams often do not remain constant. Team members are changed due to skills & knowledge required to complete team tasks. Usually, team leaders are responsible for choosing team members, determining the team structure, obtaining required resources, helping team members maximize their contributions to the team, and ensuring the team successfully completes its tasks. The coaching behaviors of R&D team leaders can therefore be observed and measured to test the effects of team coaching and LMX within teams.

Since this study was based on team level, we surveyed R&D teams. During the survey, we sent out 211 copies of team questionnaires (7 copies for each team) and responses were obtained from 47 teams. After removing the incomplete questionnaires, the final sample consisted of 47 teams (including 145 team members, 47 team leaders and department managers respectively) for data analysis. The majority of the teams were obtained from the following industries: motor (24.4%), semiconductors (15.2%), high-tech machine (13%), light & electric (13%), biotech (6.5%), computer (6.5%), medical (4.9%), testing (2.5%), logistic (2.5%). The remaining teams were from the finance and clothing industries.

3.2 Measurement

We used team coaching items (Liu, Pirola-Merlo, Yang, & Huang, 2009) modified from Team Diagnostic Survey (Wageman, Hackman, & Lehman, 2005) to measure team coaching. Team effectiveness is consisted of three scales: goals, customers, and timeliness. The

measurement was adapted from the study of Gibson, Zellmer-bruhn, and Schwab(2003). LMX items were adapted from Graen & Uhl-Bien(1995) . All items were measured on a 5-point scale (ranging from 1=strongly disagree to 5=strongly agree).All items were aggregated into team averages(George & James,1993) due to they are based at team level concept. This study includes team size as control variable for team effectiveness. According to the study of Wageman(2001), the optimal team size is between four and seven. An excessively large team will harm communication among team members.

To avoid the issue of common method variance (CMV), three different types of questionnaires were used: one for team members (rating team coaching functions, team effectiveness, & LMX); one for team leader (rating team coaching functions, team effectiveness); and one for department manager (rating team effectiveness) respectively.

3.3 Data analysis method

The items were based at team level and individual responses were aggregated into team average where necessary(George & James,1993) except LMXD. Both the interclass correlation coefficients (ICCs), and the within-group interrater agreement measure (r_{wg}) (James, Demaree, & Wolf,1993) were used to estimate the appropriateness of aggregation. The hypotheses were tested with regression analysis using SPSS.

Cronbach's α is calculated to determine the reliability of the scale. Person correlations and standard multiple regressions were conducted to test the intercorrelation and the relationship between each variable in hypothesized model respectively.

To test our hypothesized model, we tested 4 models. In model1 we only put team size as control variable. Then we added team coaching into the model as model 2, followed by adding team coaching, LMX, and LMXD concurrently as model 3. Finally, we put team coaching, LMX, LMXD to test the main effects of them on team effectiveness, and put team coaching*LMX and team coaching*LMXD to test the moderating effects of LMX and LMXD on the relationship between team coaching and team effectiveness as the full model.

4 Results

To test the appropriateness of data aggregation, ICCs and R_{wg} are computed. ICC_1 for team coaching, LMX and team effectiveness are .27, .15, .22 respectively. ICC_2 for team coaching, LMX and team effectiveness are .53, .35, .47 respectively. R_{wg} for team coaching, LMX and team effectiveness are .98, .85, and .99 respectively.

Table 2. Linear Regression

Dependent variable Independent variable	Team effectiveness			
	Model 1	Model 2	Model 3	Model 4
Constant				
Team Size	-.158	-.079	-.104	-.093
TeamCoaching		.83*	.748*	.843*
LMX			.126	.099
LMXD			.250*	.064
TeamCoaching × LMX				.219**
TeamCoaching × LMXD				-.087
F	1.021	47.016**	29.420**	23.986**
R ²	.025	.707	.761	.804
Adjusted R ²	.001	.692	.735	.771
ΔR ²	.025	.682	.054	.044

*significant at p<0.05

**significant at p<0.01

Considering the ratio of team size (47 teams) to variables(Loehlin,1991), the estimated parameters were reduced and thus the examined model was simplified when performing regression analysis. Also, following Hackman& Wageman(2005) , motivation, consultant and education are all task coaching.

In Boies & Howell’s (2006)study, they tested the moderating effect of LMX differentiation within team on the relationship between LMX quality and team level outcome. They found when team members report differentiated relationship with their leader (high LMX differentiation), the relationship between mean LMX and team potency is strong and positive. But for team conflict, when LMX differentiation is high, the relation between mean LMX and team conflict is strongly negative, but when LMX differentiation is low, the relation is weaker. Boies & Howell(2006) followed Aiken & West (1991) guideline and argued that “low differentiation” corresponds to one standard deviation above the mean R_{wg} , and “high differentiation” corresponds to one standard deviation below the mean R_{wg} . In this study, with 47 teams and 192 respondents, we used LMX within team standard deviation as LMXD, i.e. LMX(sd), the regression analysis results was showed in table 2. In Boies & Howell(2006) study, they suggested using minimum and maximum value of LMX within team to test the moderating effect of LMXD. Therefore, we tested the moderating effect of LMXD with LMX

within team whole range value, i.e. LMXD(range) as well; the regression analysis result was showed in table 3.

In table 2, all of the models are significant at $p < 0.05$ level except model 1 (the null model) ($F = 1.021, 47.016, 29.42, 23.986$ for model 1, model 2, model 3 and model 4 respectively). $R^2 = 0.025$ for model 1, 0.707 for model 2, 0.761 for model 3, and 0.804 for model 4. To test the moderating effects of LMX and LMXD(sd), We tested 4 models. In model 1 we put only team size as control variable into the model, the effect of team size on team effectiveness is not significant ($\beta = -.158$). In model 2, we tested team coaching main effect on team effectiveness. As we expected, $\beta = .83$, it is significant at $p < 0.05$ level. In Model 3, team coaching, LMX and LMXD(sd) as independent variables to test the main effects of team coaching, LMX and LMXD(sd) on team effectiveness. The β coefficients are .748, .126, and .250, respectively. Both the effects of team coaching and LMXD(sd) on team effectiveness are significant, but the main effect of LMX on team effectiveness is not significant. In the full model (Model 4), the moderating effect ($\beta = .219$) of LMX on the relationship between team coaching and team effectiveness is significant, so hypothesis 1 is supported. But the moderating effect ($\beta = -.087$) of LMXD(sd) on the relationship between team coaching and team effectiveness is not significant. Hypothesis 2 is not supported.

The parameters of hypothesized model were showed on Figure 2.

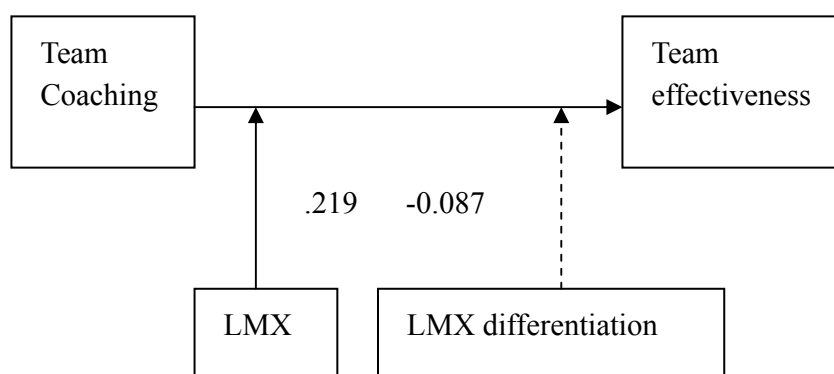


Fig.2 The parameters of hypothesized model with LMXD(sd)

5 Conclusion

In high LMX situation, it may foster team leader and members to have shared assumptions and consistent mental models. Thus, it is easier for them to communicate and make members feel that they can succeed because the leader and members share expectations. All of those foster the effect of team coaching on team effectiveness. Briefly, to enhance team effectiveness, team leader need to devote to building good quality relationship with members.

In Graen & Uhl-Bien's(1995) review, they asked" How do differentiated exchanges within the same work group affect task performance and attitudes?" The results in this study demonstrated LMX(sd) negatively moderated the relationship between team coaching and team effectiveness. Even it is not significant, but this result may inform us that if team leader does not treat team members identically, that may be detrimental to team effectiveness. In

other words, high LMXD may reduce the effect of team coaching on team effectiveness. This result is not consistent with the study of Boies & Howell(2006), where high LMXD within team moderate positively on the relationship between LMX and team potency.

With this inconsistent result, it may arise from two sources. Firstly, in Chinese culture, colleagues in the same unit usually build good relationship with each others to make high group cohesion and communication easily that is helpful for tasks accomplishment. The characteristics of Chinese culture may explain the reason why the moderating effect of LMXD is not significant, and why the moderating effect is negative. Secondly, the sample size is limited to 47 teams. It may reduce the explaining power.

This study examines the relationship between team coaching and team effectiveness, and the moderating effect of LMX and LMXD. Hypothesis 1 and 2 are supported, but hypothesis 3 is not supported. Team coaching is positively related to team effectiveness. LMX has the moderating effect, but there is no moderating effect for LMXD on the relationship between team coaching and team effectiveness. This study helps clarify how to foster the effects of team coaching with the relationship between team leader and members. The results will be valuable for practical in team leadership and leadership research.

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