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ORIGINAL PAPER

Assessing the Effect of Leadership on Performance via Adaptation and Social Interaction: The Moderation of Learning Behavior and Learning Goal Orientation

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Abstract

Drawing upon theory of group leadership, this study aims to propose a holistic team-level model to present how different leadership styles influence team performance by simultaneously evaluating their mediating and moderating mechanisms. In the model, team performance is influenced by charismatic leadership, discipline-focused leadership, and dominance-focused leadership via the mediation of adaptation and social interaction. Besides, team learning behavior and learning goal orientation are examined as moderators. Empirical tests are conducted using the data of technology work teams from a major industry zone in Taiwan. The findings of this study reveal that enhancing team learning behavior is a prioritized issue for leveraging social interaction to boost team performance. Besides, if a team can coordinate its competitive capability to handle complicated things with high team learning goal orientation, teamwork and performance are unlikely hindered by adaptation. The findings of this study suggest that team leaders should remain flexible by switching among three proposed leadership styles as the team circumstances dictate so as to maximize team performance.

Keywords Team learning behavior · Team learning goal orientation · Charismatic leadership · Discipline-focused leadership · Dominance-focused leadership

Introduction

Leadership styles have been recognized as critical input factors that influence work teams (Jahanshahi et al., 2020). Leadership styles are defined as patterns of the frequency or intensity of a leader's behavior or attitude (Johnson & Klee, 2007). They are described as an approach that causes change in a team's social system (Njoki

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& Susan, 2019). Focusing on a team as an objective of leadership, theory of group leadership justifies how effective leadership styles motivate a team to act and react in order to do things effectively (Lynch, 2019; Peterson & Kim, 2012). In other words, leadership styles substantially influence a team in which workers try making progress to solve problems or achieve goals in a collective manner (Bass, 2008; Northouse, 2021).

According to theory of group leadership, two major challenges for leaders to improve team performance include (1) how leadership styles manage within-team interpersonal interactions and (2) how leadership styles coordinate team members to adaptively meet the team's challenges. In other words, leadership styles influence team processes relevant to social interaction (i.e., affect) and adaptation (i.e., cognition) (e.g., Thomas & Wright, 2002) that eventually influence team performance (e.g., Pan & Sun, 2019; Peterson & Kim, 2012). This perspective is supported by Abu-Dieh and Warren (2014) arguing that leadership styles influence a team's cognitive and affective processes. Some empirical studies have similarly supported the mediation of social interaction or adaptation. For example, Chen and Lin (2020) has tested social interaction as a prominent mediator in the development of team performance (Chen & Lin, 2020). Stagl et al. (2006) have observed the nature of team adaptation as a mediator that drives the team's response to a stimulation or a trigger.

Adaptation is defined as a team's ability to adjust or alter its role in response to unexpected environmental changes, whereas social interaction is defined as within-team reciprocal actions taken by team workers to respond to social stimuli initiated by their peers (Lin et al., 2021). Leadership styles drive team processes associated with social processes (e.g., interaction, cohesion, or conflict) and task processes (e.g., adaptation, coordination, or resource sharing), which eventually facilitate team performance (McCormick et al., 2006). Despite much literature on leadership styles and team performance, how and in what manners different leadership styles influence team performance via social interaction and adaptation respectively have been relatively understudied, resulting in the first research gap for this study to fill. Following this line of inquiry, this study attempts to fill the second research gap regarding team learning that may moderate the effects of social interaction and adaptation on team performance. Research (Oertel & Antoni, 2014) has emphasized a growing need to study the associations among team learning (Wilson et al., 2007), social interaction (Bron et al., 2018), and adaptation (Burke et al., 2006).

Team learning refers to a dynamic and continuous process of reflective *motivation* and self-regulative *action* for learning by which team workers collaboratively detect, understand, or generate positive changes for the team (e.g., Bron et al., 2018). Team learning can be examined in depth from two dimensional aspects that consist of team learning goal orientation (i.e., motivation) and team learning behavior (i.e., action). Team learning goal orientation and team learning behavior play complementary roles as the core components of team learning, which are simultaneously examined in this study. They are both worth evaluating in a single study setting because the literature has found that the effect of team learning goal orientation on workers may be subject to team learning behavior (Kong et al., 2019).

Defined as a team's desire to strengthen collective competence and skills, team learning goal orientation characterized by persistence, self-regulation, and

self-improvement is likely to lead the team itself to act sensitively to stimulus or conditions in the team (Ismail, 2016), suggesting the potential moderating role of team learning goal orientation. Although previous research has studied the moderating role of goal orientation in team training outcomes (Chiaburu & Tekleab, 2005; Ismail, 2016), its interaction with team processes related to social interaction and adaptation has not yet been assessed. In addition to team learning goal orientation, team learning behavior also plays a moderating role that intervenes the development of team performance. Team learning behavior is considered the collective discourse activities of team workers that enable the entire team to acquire, refine, and utilize knowledge and skills (Koeslag-Kreunen et al., 2021). These activities are different from team processes (e.g., adaptation and social interaction) that mostly focus on team members' interplay and reciprocity before, during, and after teamwork completion and managing conflict, emotions, and team spirit (Gabelica et al., 2012). By means of team learning behavior, team workers with a strong shared conception of teamwork and how to execute it can become sensitive to the ways through which team performance is achieved (e.g., Van den Bossche et al., 2011). Previous research has found that team learning behavior intervenes dynamic and cumulative team processes that involve social interaction, sense-making, and mutual understanding (Garavan & McCarthy, 2008).

In short, leadership represents a shared property of work teams (Ziegert et al., 2021) and is thus a core driver for team performance (Lin et al., 2022). For that reason, leadership is indispensable for being seamlessly integrated with such team processes as adaptation and social interaction (Guastello, 2009) across different contingent statuses (e.g., learning goal orientation) (Donaldson, 2001). This study contributes to the literature by developing a holistic team-level process between leadership styles and team performance with key moderators. Without a strong understanding of the process regarding (1) the mediating mechanism of social interaction and adaptation and (2) the moderating mechanism of team learning goal orientation and team learning behavior, our knowledge about the process will be limited to a large extent, and workplace initiatives directed at building leadership styles and team learning will remain highly unjustifiable based on intuitive biases or blind faith.

This work differs from prior studies in two important ways. First, this work advances beyond previous leadership research that discussed one single leadership style (e.g., Rast et al., 2013) or the influence of leadership on individuals (e.g., Lin, 2020) by simultaneously assessing multiple leadership styles at the team-level of analysis. Second, this work complements the literature by explicating how team leaning may interact with adaptation and social interaction (i.e., two interaction terms) simultaneously to influence team performance, which has been rarely discussed in previous research. More specifically, the simultaneous moderating effects of team learning goal orientation and team learning behavior are examined in this study. Third, instead of single source data for all variables in some previous research, this study collects data from two different sources for measuring different factors, which can substantially reduce the threat of common method variances (CMV).

Research Model and Hypotheses

Drawing upon theory of group leadership, this study proposes a model that demonstrates the development of team performance. In the model, team performance is influenced by charismatic leadership, discipline-focused leadership, and dominance-focused leadership via the mediation of adaptation and social interaction. At the same time, team learning behavior and team learning goal orientation are hypothesized to moderate the effects of adaptation and social interaction on team performance. Note that this research contributes to the understanding of leadership by revealing how three distinct leadership styles influence team performance differently. A core assumption of theory of group leadership is that effective leaders must have the capability of using multiple leadership styles, and, inversely, that reliance of merely one or two styles is unlikely to achieve great performance (Peterson & Kim, 2012). This notion of ''miscellany'' or cognitive complexity (Thompson, 2000) among the three proposed leadership styles of this study supported that multiple leadership styles are desirable and applicable in various situations (Cooper, 2016; Reich et al., 2009).

Understanding leadership requires a main focus not only on multiple leadership styles but also on how these leadership styles function together to motivate teams. Team leaders play multiple roles and show a variety of qualities that are interwoven in complicated ways to inspire the entire team. With regard to the proposed mediators of this study, the literature has suggested that the capability of team workers often contributes to team performance if they are enabled and motivated by leadership styles (Hotho et al., 2012) to engage in such team processes as adaptation and social interaction. In other words, leadership styles are likely to lead to differences in team processes, which supports the notion that the influence of leadership styles on the development of team performance is substantially mediated by social interaction and adaptation (Gooderham et al., 2011). All in all, the theoretical justifications for deriving our hypotheses are discussed in detail below.

Adaptation, Social Interaction, and Team Performance

Adaptation is defined as collective reactive and flexible adjustments to improve a team's internal system (Jossberger et al., 2020; LePine, 2003). For example, a team with high adaptation can quickly adjust its schedule to perform team tasks or promptly respond to environmental change or competition. Team performance relies heavily on the effectiveness with which team members collectively adapt their roles to streamline teamworking (Hutchins, 1996). A team with high adaptation suggests that its collective activity is consistent or congruent with the demand of the new situations and can deal with unexpected problems in a timely manner, consequently increasing team performance (LePine, 2003). In other words, team performance is positively related to the extent to which a team with great adaptation to perform well after an unforeseen change (LePine, 2003).

In addition to adaptation, social interaction is an equally important factor that positively affects team performance. Research has found that the quality of social

interaction within an entrepreneurial team substantially influences the team's success (Smeets et al., 2021). Team performance is positively influenced by social interaction that facilitates the formation of social capital (Lee et al., 2015; Wallin et al., 2020), within-team communication, cooperation among team members, the creation of collective meaning, and knowledge exchange via face-to-face dialogue between team members. To sum up, social interaction that enhances collective awareness regarding teamwork (Rintala & Nokelainen, 2020) substantially helps improve team performance.

Different Leadership Styles and their Effects

Previous research has revealed charismatic and authoritarian leadership as two critical leadership styles that should be both taken into account simultaneously to explain workers' motivation (e.g., Lee, 1999; Zhao & Sheng, 2019) because different leadership styles can help a team be successful across a variety of contexts and history (Sechrest, 2020). For example, a survey on executives in Taiwanese companies has revealed that different effective leadership styles can be found in the same leader under different circumstances (Kao & Kao, 2007). This perspective is also supported by Tatum et al. (2003) who argue the necessity that a leader should adopt a strategy of using multiple leadership styles to cope with different situations.

Unlike charismatic leadership that clearly fuses team workers' goals (Lin et al., 2019a, 2019b), authoritarian leadership shows the double-edged nature of having both constructive and destructive effects on a team (Wang et al., 2021; Zhang et al., 2020). For that reason, authoritarian leadership that counts primarily on legitimate authority and professional expertise to influence the team can be recognized as a two-dimensional construct (Chen, 2011; Zhao et al., 2021). including discipline-focused leadership and dominance-focused leadership (Chou & Cheng, 2014; Harper, 2020; Wu et al., 2020). It is important to note that authoritarian leadership is highly related to non-democratic leadership with strong power and control that often employs one-sided communication (Kim & Lee, 2020). To sum up, this study discusses a total of three leadership styles, including charismatic leadership, discipline-focused leadership, and dominance-focused leadership.

Charismatic leadership is defined as a social influence process that provides inspiration to motivate collective action, exemplifies sensitivity to environmental changes, and displays enthusiastic behavior. Charismatic leadership is highly related to authentic and transformational leadership, but it specifically refers to a leader who is viewed as possessing an innately inspired gift (Borkowski, 2012). The traits of charismatic leadership such as innovation, faith, adventure, social sensitivity, and risk-taking enable the entire team to learn to be more adaptive to surroundings (Lee et al., 2015), consequently improving team performance. Charismatic leadership provides an attractive vision, infuses teamwork with meaning, and inspires team members to transcend self-interest with great adaptation for the sake of the collective (De Hoogh & Den Hartog, 2009). Charismatic leadership offers a team an energizing sense of purpose, and helps strengthen its confidence and flexibility in achieving goals. As a result, adaptation is motivated by charismatic leadership to

reframe stressful or challenging situations as opportunities for obtaining team performance (De Hoogh & Den Hartog, 2009). To sum up, a team supervised by charismatic leadership is more likely to be adaptive to its operation modes, consequently boosting team performance. The first hypothesis is thus derived as below.

H1: Adaptation mediates the positive relationship between charismatic leadership and team performance.

Charismatic leadership influences team performance indirectly through social interaction due to two major reasons. First, charismatic leadership evokes a high degree of emotional attachment in the team and serves as a catalyzer for social bonding that facilitates team performance (Hundeide, 2004). Second, charismatic leadership enhances team performance by consolidating social relationships through within-team interaction, identity, cooperation, and cohesion (e.g., Paulsen et al., 2009). All in all, the mediating role of social interaction between charismatic leadership and team performance is described in the following hypothesis.

H2: Social interaction mediates the positive relationship between charismatic leadership and team performance.

Discipline-focused leadership style is defined as a leader's style that imposes rigorous disciplines, precise work rules, and meticulous principles for team workers to follow (Chou & Cheng, 2014). Discipline-focused leadership emphasizes strict requirements with high performance standards, which urge the team to raise the performance bar and pay attention to its continuous improvement (Chou & Cheng, 2014). As a result, the team is propelled to increase its adaptive capacity by adjusting knowledge and skills to increase team performance (Chou & Cheng, 2014). On the contrary, a team without discipline-focused leadership often has no motivation to enhance its adaptation and is left to wander aimlessly across teaming activities (Rosen, 2005), eventually decreasing team performance. The literature has evidenced that without discipline a team can become chaotic (Lewis & Andriopoulos, 2013a, 2013b) and the creativity that flows from its generation of new ideas can easily escape (Keathley & Owens, 2010). Therefore, a hypothesis is derived below.

H3: Adaptation mediates a positive relationship between discipline-focused leadership and team performance.

Discipline-focused leadership emphasizes a team's rules and order, which evokes the order of interconnection that contributes to social relationship and social bonds (Kark & Van Dijk, 2007). This phenomenon is understandable because a team under discipline-focused leadership tends to act according to established norms (Zhao et al., 2021), which help avoid within-team social conflict and misunderstanding. Therefore, conformity to the disciplines and norms is often welcome while deviations from them are likely socially rejected or isolated (Zhao et al., 2021). On the contrary, if a team resists against discipline-focused leadership, its value such as disobedience and contrariness can widespread and becomes detrimental for within-team social interaction, consequently

reducing team performance. Collectively, the indirect relationship between discipline-focused leadership and team performance is derive as below.

H4: Social interaction mediates a positive relationship between discipline-focused leadership and team performance.

Dominance-focused leadership is defined as a leader's style that stresses his/her unquestionable authority over, rigorous control on, and complete obedience of the team. Dominance-focused leadership emphasizes a leader's absolute authority that demands full control and complete obedience, consequently weakening team workers' flexible capacity and adaptive competence (Chou et al., 2010). In other words, dominance-focused leadership substantially misdirects a team and thwarts its adaptation to grow and succeed (Chou & Cheng, 2014). This negative effect of dominance-focused leadership on adaptation is theoretically justifiable because a team under dominance-focused leadership is not expected to perform autonomy and adjustment. As a result, the team will lack the motivation to adapt and fine-tune collective functions to achieve team performance. To sum up, teams under dominance-focused leadership are discouraged from being adaptive to achieve performance goals, leading to the following hypothesis.

H5: Adaptation mediates a negative relationship between dominance-focused leadership and team performance.

Despite its negative influence on adaptation, dominance-focused leadership may generate a positive influence on social interaction that consequently enhances team performance. Dominance-focused leadership with unreasonable demands often makes a team full of strain and frustration (Chou & Cheng, 2014; Chou et al., 2010), which trigger within-team social needs and interaction for affiliation, sympathy, or belonging. More specifically, with greater strain and frustration caused by dominance-focused leadership, the team feels a strong need to intensify social interaction by, for example, griping and joking. In other words, given fear and coercion caused by dominance-focused leadership (Sung & Choi, 2021), a team tends to resort to social interaction as a coping strategy because social interaction characterized by companionship and mutual support facilitates a sense of we-ness (Pouthier, 2017) to consequently boost team performance (Buunk & Verhoeven, 1991). For example, communication research has indicated that a leader's dominance can bring team workers into line (e.g., increased social interaction), which is particularly helpful in stressed situations or in teams with unavoidable social dilemmas (Schermuly & Scholl, 2012). All in all, the hypothesized relationship between dominance-focused leadership and team performance is derived below.

H6: Social interaction mediates a positive relationship between dominance-focused leadership and team performance.

Moderating Effects

Following the preceding hypothesized effects of adaptation and social interaction on team performance, this study further explores how these effects are influenced by team learning goal orientation and team learning behavior. The moderation of team learning behavior and learning goal orientation is analogous with compensation effect for adaption and social interaction in which teams with higher levels of team learning behavior and/or learning goal orientation are more self-motivated and willing to manifest team engagement persistently (VandeWalle, 1997) and, thus, less dependent on "external" motivating variables (Zacher & Jimmieson, 2013), such as adaptation and social interaction.

Team learning behavior is demonstrated by team workers' collective actions to ask questions, seek feedback from, and discuss with a variety of people (e.g., experts, customers, and suppliers) for information (Ortega et al., 2014). Complementing team learning behavior based on diverse information, team learning goal orientation represents a team's motivation to develop collective competence by trying new ideas, acquiring new skills, and handling challenging tasks (Esmaeilikia & Groth, 2019, p.6), which is in contrast to the human tendency to rely excessively on habitual or inertial behavior (Edmondson, 1999).

Team learning behavior represents a distinctive and habitual manner of actively engaging in learning new knowledge and skills (Van Der Sluis & Poell, 2002). Social learning theory argues that team learning behavior can alter the team's process towards performance goals. Specifically, a team with strong team learning behavior lends itself to handle challenges instead of overreliance on adjustments or adaptation to external rapid changes (Yoon & Kayes, 2016). Strong team learning behavior constitutes a proactive action for exploration and experimentation (Hirst et al., 2009), which enlarge a team's knowledge and responsiveness about how to function effectively. This logic suggests that a team with stronger team learning behavior is more capable of coping with changing demands in teamworking, regardless of its adaptation. On the contrary, as a team with weak team learning behavior suggests its incapability to obtain novel information as new input and possibilities, the team has to count more heavily on adaptation (e.g., collective improvisation) to streamline collective efforts for achieving team performance. Note that team learning behavior focuses on collective actions to obtain task-relevant knowledge and skills (i.e., proactive task-based learning), whereas adaptation focuses on changes in response to unanticipated events (i.e., passive event-based changes on demand) (Henrickson Parker et al., 2018). Previous research has verified team learning behavior as a moderator across fields such as engineering (Blank & Naveh, 2018), creativity (Hirst et al., 2009), retailing (Yoon & Kayes, 2016), R&D (Chung & Li, 2021), and education (Tahir et al., 2021). Based on the above rationales, the negative moderation of team learning behavior is hypothesized below.

H7: Team learning behavior negatively moderates the relationship between adaptation and team performance, such that the relationship is weaker when team learning behavior is stronger.

Team learning behavior is denoted by gaining knowledge, communicating, and seeking feedback in an open-minded work environment, which intensifies the positive effect of social interaction on team performance. Team learning behavior that focuses on collective knowledge pursuit is different from social interaction that focuses on interpersonal sociability. Social interaction is likely to interact with team learning behavior to cooperatively influence team performance because they both reinforce each other reciprocally. That is to say, social interaction as a communication interface in the team comes into play with team learning behavior to jointly enhance team performance. On the contrary, social interaction becomes less influential to team performance given a team's lack of action for updating information, testing assumptions, discussing errors, and experimenting (i.e., weak team learning behavior) (Van Minh et al., 2017). Hence, next hypothesis is derived below.

H8: Team learning behavior positively moderates the relationship between social interaction and team performance, such that the relationship is stronger when team learning behavior is stronger.

Team learning goal orientation reflects the shared perception of a team that proactively engages in learning to enhance the team's capability. The literature (Decius et al., 2021) has reported the importance of team learning goal orientation for active participation in workplace activities because learning goals unites team workers to obtain feedback and monitor their collective effectiveness to fine-tune adjustment or flexibleness in the teamwork setting. Since high team learning goal orientation enables a team to conscientiously learn new skills and undertake challenging tasks, the overly dependence on adaptation is reduced. The team is skillful for handling different tasks and situations without having to frequently make adaptation in response to changing conditions or environment. On the contrary, since a low level of team learning goal orientation prevents the team from making efforts and staying focused on improvement, the importance of adaptation becomes critical for the team to keep its functioning at a sustainable level (Blacker & Deveau, 2010). Accordingly, a hypothesis is derived as follows:

H9: Team learning goal orientation negatively moderates the relationship between adaptation and team performance, such that the relationship is weaker when team learning goal orientation is stronger.

Decius et al. (2021) has suggested that the mixture of team learning dispositions (e.g., team learning goal orientation) and social resources (e.g., social interaction or connections) is important for a wide variety of occupations. Team learning goal orientation interacts with social interaction because a team's collaborative learning capability depends heavily on social integration of team workers (Crossan et al., 1999; Decius et al., 2021). Social integration is the development of a shared understanding and a collective mind among team workers through quality social interaction. For that reason, team learning goal orientation helps amplify the influence of social interaction that facilitates an open flow of communication to enhance team performance (e.g., Kaplan & Maehr, 2007). When the level of team learning goal

orientation is high, a team with good social interaction is granted opportunities to (1) increase knowledge sharing and creation, and (2) strengthen a tacit understanding about the team's internal skills and abilities for effective coordination. Under such a circumstance, social interaction exerts a positive effect more strongly on team performance. Hence, the final hypothesis is derived below.

H10: Team learning goal orientation positively moderates the relationship between social interaction and team performance, such that the relationship is stronger when team learning goal orientation is stronger.

Methods

Subjects and Procedures

The research hypotheses described above were empirically tested using data from high-tech work teams related to computer and communication in a large industrial zone in northern Taiwan. Since novice workers without sufficient work experiences might find it difficult to respond to our field survey properly, this study investigated the participants who were experienced workers with a tenure of at least one year in their organization. We first approached EMBA (Executive MBA) alumni who worked as top management in the industry zone to help conduct a field survey. A total of 11 large high-tech firms supported this study for its survey. To increase the research participants' willingness to fill research questionnaires, this study conducted its survey anonymously. Participants were assured that data collected from them would be used only for aggregated statistical analyses and any individuals' response and information would be kept highly confidential under all circumstances.

Sample teams were randomly selected by senior managers in the department of HRM (Human Resource Management) and then these teams were invited to volunteer to participate. This study collected data from two sources with a split-team sampling approach (Jiang et al., 2016). In each team, a team leader and four members were asked to measure different research variables. Team members were invited to measure three predictors (charismatic leadership, discipline-focused leadership, and dominance-focused leadership), one mediator (adaptation), one moderator (team learning behavior), and one outcome (team performance). At the same time, team leaders were invited to measure the other mediator (social interaction), moderator (team learning goal orientation), and outcome (team performance). The advantage of using the split-team sampling approach was twofold. First, since our research subjects included members and leaders across teams, it was appropriate to have different subjects to measure variables suitable for them. For example, it might be less objective or more biased if leaders' styles were measured by the leaders themselves instead of team members. Second, having different participants measure different variables was an effective precautionary method that alleviated the concern of common method variances (CMV) (Jiang et al., 2016). The literature has suggested that the precautionary measure by collecting data from different subjects was

much superior to any post-hoc remedy or statistical adjustments for CMV (Lin et al., 2019a, 2019b). Note that three leadership variables were measured by team members to avoid complacent or narcissistic ratings by team leaders themselves. Team performance was measured by both team members and their leader because team performance measured by both team members and their leader from a holistic viewpoint was more credible than that measured by either the leader or the members alone (Lin et al., 2019a, 2019b).

Of the 450 questionnaires distributed to 90 teams (i.e., four questionnaires for members and one questionnaire for the leader each team), a total of 368 usable questionnaires from 77 teams were returned for a team-level response rate of 85.56%. A total of 77 team leaders comprised 58 male leaders (75.32%), 50 leaders with the age of 35 or older (64.94%), and 53 leaders with job experience of 10 years or above (68.83%). A total of 291 team members included 156 male members (53.61%), 186 members at the age of 35 or older (63.92%), and 171 members with the job experience of 10 years or above (58.76%).

This study performed data analyses with five stages. First, intraclass correlations were assessed to show the appropriateness of data aggregation to form team-level data. Second, the team-level data were analyzed using confirmatory factor analysis (CFA) to evaluate reliability and validity. Third, hierarchical moderated regression analysis was employed to test our hypotheses. Fourth, the mediation effects were tested and confirmed by bootstrapping. Finally, Unmeasured Latent Method Construct (ULMC) technique was used to verify the potential threat of CMV.

Measures

The constructs in this study were measured using 5-point Likert scales drawn and modified from existing literature (see Appendix A). Before its actual survey, this study adopted a focus group and two pilot surveys to check the readability and reliability of questionnaire items. The second pilot survey data were assessed using exploratory factor analysis. The participants in two pilot surveys were excluded from the subsequent actual survey. The correlation matrix was provided in Appendix B.

Data Analysis

Intraclass Correlations

To confirm whether it was appropriate to aggregate individuals' responses into team-level data, this study analyzed the intraclass correlation based on teams. The analytical results showed that team-level data aggregation was appropriate based on the criteria suggested in the literature (see Table 1). Hence, the data were aggregated based on teams for empirical analyses in the followings.

CFA analyses for the respective datasets of team members and leaders were separately performed. The results in Tables 2 and 3 showed that the figures of NNFI, CFI, and Bollen Non-normed Index Delta2 were all close to or larger than 0.9.

Table 1 Inter-rater reliability of the data from members

Construct	ICC_1	ICC_2	r_{wg}
Charismatic leadership	0.7718	0.9274	0.9798
Discipline-focused leadership	0.7954	0.9363	0.9791
Dominance-focused leadership	0.7684	0.9261	0.9637
Team adaptation	0.7562	0.9214	0.9677
Team performance	0.6437	0.8722	0.9659
Team learning behavior	0.9084	0.9740	0.9375

Note 1: The ICC_1 values were larger than the recommended level of 0.12

Note 2: The ICC_2 values were larger than the recommended level of 0.60

Note 3: The rwg values were larger than the recommended level of 0.70

The figures of RMR were slightly larger than 0.05 and the figures of RMSEA were slightly higher than 0.08. Specifically, the literature has indicated that the value of RMSEA between 0.08 and 0.10 was considered moderate but acceptable fit (Briscoe et al., 2006). Collectively, the analytical results in Tables 2 and 3 revealed acceptable goodness-of-fit indices.

Convergent validity was supported based on three recommended criteria. To begin with, all factor loadings in Tables 2 and 3 were all significant at $p < 0.001$. Besides, the figures of average variance extracted (AVE) were all larger than 0.50. Finally, all the reliabilities of variables were larger than 0.70. With regard to discriminant validity, it was confirmed by chi-square difference tests. Since our chi-square difference statistics for all pairs of constructs in Tables 4 and 5 met the overall significance level to 0.01 or lower, the discriminant validity was supported.

Testing of Hypotheses

This study performed hierarchical moderated regression to test its hypotheses. To reduce unexpected biases, this study included six relevant control variables such as leaders' gender, leaders' age, and so on. The leader's gender was controlled because it substantially influenced the associations between leadership styles and workers' performance (Ebrahimi et al., 2017). Analogously, the leader's work experience was controlled because it might influence the likelihood of team project success (Easton & Rosenzweig, 2015). Table 6 presented the test results.

In Model 1, this study included charismatic leadership, discipline-focused leadership, and dominance-focused leadership to explain adaptation, revealing that both charismatic leadership and discipline-focused leadership significantly related to adaptation with the coefficients of 0.34 ($p < 0.01$) and 0.37 ($p < 0.01$) respectively. In Model 2, the test result showed that both charismatic leadership and dominance-focused leadership significantly related to social interaction with the coefficients of 0.56 ($p < 0.01$) and 0.34 ($p < 0.01$) respectively.. In Model 3, this study examined the effects of adaptation and social interaction on team performance, revealing

Table 2 Team-level standardized loadings of the data from members ($N_1 = 77$)

Construct	Indicators	Standardized loading	AVE	Cronbach's α
Charismatic leadership	CL1	0.89 (t = 36.15)	0.82	0.96
	CL2	0.86 (t = 27.36)		
	CL3	0.91 (t = 41.09)		
	CL4	0.85 (t = 25.97)		
	CL5	0.91 (t = 45.28)		
	CL6	0.92 (t = 51.33)		
	CL7	0.96 (t = 82.83)		
	CL8	0.92 (t = 47.14)		
	CL9	0.89 (t = 37.91)		
	CL10	0.95 (t = 76.51)		
Discipline-focused leadership	DI1	0.87 (t = 29.19)	0.72	0.94
	DI2	0.85 (t = 24.50)		
	DI3	0.80 (t = 17.94)		
	DI4	0.82 (t = 20.89)		
	DI5	0.86 (t = 26.30)		
	DI6	0.79 (t = 16.97)		
	DI7	0.90 (t = 37.00)		
	DI8	0.91 (t = 38.82)		
Dominance-focused leadership	DO1	0.98 (t = 179.10)	0.76	0.93
	DO2	0.99 (t = 204.10)		
	DO3	0.94 (t = 55.95)		
	DO4	0.76 (t = 15.28)		
	DO5	0.60 (t = 8.28)		
	DO6	0.88 (t = 31.81)		
Team adaptation	TA1	0.85 (t = 24.62)	0.76	0.94
	TA2	0.88 (t = 29.55)		
	TA3	0.89 (t = 31.56)		
	TA4	0.85 (t = 25.12)		
	TA5	0.84 (t = 22.80)		
	TA6	0.91 (t = 37.93)		
Team performance	TP1	0.92 (t = 49.09)	0.83	0.96
	TP2	0.90 (t = 34.85)		
	TP3	0.87 (t = 28.52)		
	TP4	0.94 (t = 52.81)		
	TP5	0.93 (t = 55.16)		
Team learning behavior	TL1	0.98 (t = 34.60)	0.92	0.96
	TL2	0.99 (t = 43.46)		
	TL3	0.91 (t = 36.97)		

Goodness-of-fit indices: $\chi^2_{650} = 1082.92$ (p-value < 0.0001); NNFI = 0.88; CFI = 0.89; Bollen Non-normed Index Delta2 = 0.89; RMR = 0.04; RMSEA = 0.09

Table 3 Team-level standardized loadings of the data from leaders ($N_2 = 77$)

Construct	Indicators	Standardized loading	AVE	Cronbach's α
Social interaction	SI1	0.92 (t = 30.31)	0.64	0.86
	SI2	0.81 (t = 17.72)		
	SI3	0.85 (t = 20.90)		
	SI4	0.57 (t = 6.83)		
Team learning goal orientation	LGO1	0.91 (t = 35.19)	0.80	0.90
	LGO2	0.99 (t = 52.52)		
	LGO 3	0.76 (t = 14.95)		
Team performance	TP1	0.85 (t = 20.17)	0.65	0.90
	TP2	0.82 (t = 17.83)		
	TP3	0.79 (t = 15.61)		
	TP4	0.74 (t = 12.39)		
	TP5	0.82 (t = 17.96)		

Goodness-of-fit indices: $\chi^2_{51} = 91.57$ (p-value < 0.0001); NNFI = 0.92; CFI = 0.94; Bollen Non-normed Index Delta2 = 0.94; RMR = 0.07; RMSEA = 0.10

Table 4 Chi-square difference tests of the data from members

Construct pair	$\chi^2_{650} = 1082.92$ (unconstrained model)	
	χ^2_{651} (constrained model)	χ^2 difference
(Charismatic leadership, Discipline-focused leadership)	1456.44	373.52***
(Charismatic leadership, Dominance-focused leadership)	1610.16	527.24***
(Charismatic leadership, Team adaptation)	1311.23	228.31***
(Charismatic leadership, Team performance	1403.93	321.01***
(Charismatic leadership, Team learning behavior)	1396.84	313.92***
(Discipline-focused leadership, Dominance-focused leadership)	1663.82	580.90***
(Discipline-focused leadership, Team adaptation)	1277.66	194.74***
(Discipline-focused leadership, Team performance	1363.65	280.73***
(Discipline-focused leadership, Team learning behavior)	1645.98	563.06***
(Dominance-focused leadership, Team adaptation)	1517.82	434.90***
(Dominance-focused leadership, Team performance	1562.90	479.98***
(Dominance-focused leadership, Team learning behavior)	1383.72	300.80***
(Team adaptation, Team performance	1273.91	190.99***
(Team adaptation, Team learning behavior)	1499.16	416.24***
(Team performance, Team learning behavior)	1518.40	435.48***

*** Significant at the 0.001 overall significance level by using the Bonferroni method

significant effects with the coefficients of 0.55 ($p < 0.01$) and 0.18 ($p < 0.01$) respectively. In Model 4, three antecedents and two mediators were all included to explain team performance, revealing that only the mediators were significant. This result

Table 5 Chi-square difference tests of the data from leaders

Construct pair	$\chi^2_{51} = 91.57$ (unconstrained model)	
	χ^2_{52} (constrained model)	χ^2 difference
(Social interaction, Team learning goal orientation)	178.09	86.52***
(Social interaction, Team performance)	230.28	138.71***
(Team learning goal orientation, Team performance)	299.82	208.25***

*** Significant at the 0.001 overall significance level by using the Bonferroni method

suggested that all three types of leadership had no direct relationship with team performance, thus supporting their indirect effects on team performance through adaptation and social interaction.

To test its hypothesized moderation, this study included team learning behavior, team learning goal orientation, and their interactions with adaption and social interaction in Model 5. First, team learning behavior did not moderate the relationship between adaptation and team performance (H7 was not supported). Second, team learning behavior showed a positive moderating effect on the relationship between social interaction and team performance (H8 was thus supported). Third, team learning goal orientation showed a negative moderating effect on the relationship between adaptation and team performance (H9 was thus supported). Fourth, team learning goal orientation did not moderate the relationship between social interaction and team performance (H10 was not supported).

Since the literature indicated that leadership styles might be somewhat related to team learning behavior or team learning goal orientation, this study further included leadership styles as a control in Model 6 in order to eliminate their unexpected effects on our test results. The results showed that the significant interaction effects in Model 5 remained significant in Model 6, supporting the robustness of our test results not affected by leadership styles.

This study performed bootstrapping analyses with 5000 subsamples to confirm its hypothesized full mediation (see Table 7). The results show the consistency with the test results of preceding hierarchical moderated regression analyses. That is, H1, H2, H3, and H6 are supported but H4 and H5 are not supported.

Results

The results of H1-H10 were summarized in Table 8. The supported H8 and H9 were also demonstrated in graphs in Appendix C.

To verify the potential threat of CMV, this study performed the ULMC technique (Williams et al., 1989). Specifically, this study compared three models for verifying CMV, including (1) the trait model (i.e., the basic CFA model in the preceding analysis), (2) the method model (with the unmeasured latent method construct), and (3) the restricted ULMC CFA model (in which trait correlations and trait factor loadings were fixed with the values obtained from the basic CFA model). The results for

Table 6 Team-level hierarchical regression analysis

	Model 1 Adaptation	Model 2 Social interaction	Model 3 TP	Model 4 TP	Model 5 TP	Model 6 TP
Control variables:						
Team leader's gender	-0.02	-0.10	-0.16	-0.15	-0.05	-0.06
Team leader's age	0.01	-0.02	-0.01	-0.01	-0.01	-0.01
Team leader's work experience (years)	-0.01	0.01	-0.01	0.01	0.01	0.01
Percentage of male members	-0.07**	0.15*	-0.03	-0.03	-0.01	-0.01
Percentage of higher education	-0.01	-0.07	-0.01	-0.01	0.01	0.01
Percentage of seniority (> 10 year-tenure)	-0.01	-0.01	-0.02	-0.03	-0.04	-0.04
Antecedents:						
Charismatic leadership	0.34**	0.56**		-0.14		-0.02
Discipline-focused leadership	0.37**	-0.29		0.21		0.11
Dominance-focused leadership	-0.07	0.34**		-0.10		-0.06
Mediator:						
Adaptation			0.55**	0.45**	1.11**	1.01**
Social interaction			0.18**	0.23**	-0.47**	-0.44**
Moderators and interaction terms:						
Team learning behavior (CLB)					-1.53**	-1.43**
CLB x Adaptation					0.17	0.16
CLB x Social interaction					0.18**	0.18**
Team learning goal orientation (LGO)					1.70**	1.65**
LGO x Adaptation					-0.37**	-0.38**
LGO x Social interaction					0.02	0.03
Adj R^2	0.68	0.31	0.46	0.49	0.75	0.76

* $p < 0.05$

** $p < 0.01$

TP = Team performance

data from team members and leaders were summarized respectively in Tables 9 and 10. The significant differences of the Chi-square fit statistics between Model 1 and Model 2 in Tables 9 or 10 suggested the potential existence of CMV. However, the insignificant differences of the Chi-square fit statistics between Model 2 and Model 3 in Tables 9 or 10 suggested that CMV did not cause significant estimation biases. Thus, our empirical results were not significantly affected by CMV. To sum up, CMV was unlikely a threat because data from two different sources (i.e., team leaders and members) were eventually combined together in preceding data analyses.

Table 7 The results of the mediation using bootstrapping

Indirect Effect	Bootstrapping with 5000 subsamples	
	95%CI_L	95%CI_U
H1: Charismatic leadership ➔ Adaptation ➔ Team performance	0.0381	0.2493
H2: Charismatic leadership ➔ Social interaction ➔ Team performance	0.0585	0.2500
H3: Discipline-focused leadership ➔ Adaptation ➔ Team performance	0.0516	0.3871
H4: Discipline-focused leadership ➔ Social interaction ➔ Team performance	-0.2213	0.0324
H5: Dominance-focused leadership ➔ Adaptation ➔ Team performance	-0.0767	0.0064
H6: Dominance-focused leadership ➔ Social interaction ➔ Team performance	0.0311	0.1427

CI = Confidence interval

Table 8 Empirical results of hypotheses

Hypotheses	Results
H1: Adaptation mediates the positive relationship between charismatic leadership and team performance	Supported
H2: Social interaction mediates the positive relationship between charismatic leadership and team performance	Supported
H3: Adaptation mediates a positive relationship between discipline-focused leadership and team performance	Supported
H4: Social interaction mediates a positive relationship between discipline-focused leadership and team performance	Not supported
H5: Adaptation mediates a negative relationship between dominance-focused leadership and team performance	Not supported
H6: Social interaction mediates a positive relationship between dominance-focused leadership and team performance	Supported
H7: Team learning behavior negatively moderates the relationship between adaptation and team performance such that the relationship is weaker when team learning behavior is stronger	Not supported
H8: Team learning behavior positively moderates the relationship between social interaction and team performance such that the relationship is stronger when team learning behavior is stronger	Supported
H9: Team learning goal orientation negatively moderates the relationship between adaptation and team performance such that the relationship is weaker when team learning goal orientation is stronger	Supported
H10: Team learning goal orientation positively moderates the relationship between social interaction and team performance such that the relationship is stronger when team learning goal orientation is stronger	Not supported

Table 9 ULMC analysis for the data of team members

	χ^2	d.f	Model comparisons	
Model 1	1082.92	650		
Model 2	946.24	612	Model 1 vs. Model 2	$\Delta\chi 2\ (38) = 136.68$*
Model 3	972.58	665	Model 2 vs. Model 3	$\Delta\chi 2\ (53) = 26.34$

Table 10 ULMC analysis for the data of team leaders

	χ^2	d.f	Model comparisons	
Model 1	91.57	51		
Model 2	36.23	39	Model 1 vs. Model 2	$\Delta\chi^2\ (12) = 55.34$*
Model 3	57.40	54	Model 2 vs. Model 3	$\Delta\chi^2\ (15) = 21.17$

Discussion

This study presents the importance of three diverse types of leadership and how team learning behavior and team learning goal orientation generate different moderating effects in the development of team performance. Additionally, this study bridges leadership styles and team performance by demonstrating the mediating mechanism of adaptation and social interaction. Based on its findings, this study discusses following theoretical and managerial implications.

Theoretical Implications

This study has two major theoretical implications. First, this study conceptualizes three novel types of leadership as predictors of team performance based on theory of group leadership (Jiggins et al., 2016; Lynch, 2019). Such theoretical conceptualization of leadership complements most widely researched leadership theories (e.g., Martinez et al., 2018), including transactional leadership based on theory of contingent reward, transformational leadership based on intrinsic motivation, and ethical leadership based on social learning theory. Every leadership style has its own strengths and weaknesses. By evaluating multiple types of leadership simultaneously, this study clarifies the synthetic value of diverse leadership styles and how they should be taken into account together for management to nurse leaders and practice leadership training and education.

Second, this research incorporated learning-relevant factors into the development of team performance from a leadership perspective. Specifically, this study theorizes and validates team learning behavior and team learning goal orientation as two moderators in the development of team performance. Our theoretical reasoning is consistent with the argument of goal orientation theory in which learning goals have been conceived of as more enduring dispositions towards teamwork engagement. Our rationales complement prior discussion that performing team learning behavior or adopting team

learning goal orientation is highly associated with social interaction quality as well as adaptive response in teams (e.g., Mun & Hwang, 2003; Yoon & Kayes, 2016).

Practical Implications

This study finds critical vocational implications for teamwork practices. First, although traditional wisdom tends to classify a manager with a specific leadership style, a manager's leadership is actually so complicated that he/she often operates across changing workplace environment with different leadership styles. It is important to examine not just one or two but three diverse leadership styles to reveal how a manger can leverage respective advantages of different leadership styles to achieve team goals. For that reason, this study contributes to management practices by demonstrating how team leaders can make good use of multiple leadership styles simultaneously. There exists no single perfect leadership that boosts performance and creativity alone without side effects, and thus an integration of diverse leadership can maximize a proportion of variance in performance outcomes (Zacher, Robinson, & Rosing, 2016).

Leadership training and educational programs should assign leader candidates to multiple leadership roles across virtual teams or actual workplace circumstances with mentoring support from senior managers. Leader candidates must be encouraged to cultivate thoughtful and favorable relationships with others. They must also understand the importance of interpersonal communication and a desire to bring teams together in challenging activities. As a result, the candidates are able to wear different hats with great leadership skills essential to lead future teams as they go. In the programs, it is also necessary for the candidates to understand diverse leadership consequences based on the findings of this study so that they are likely to make use of their leadership skill set efficaciously.

As two major mediators, adaptation and social interaction should be periodically measured (e.g., bimonthly or quarterly) for a leader's reference to fine-tune their leadership styles. For example, too much dominance-focused leadership that team workers fear for may accidentally generate the side effect of facilitating their social interaction to comfort each other. Therefore, when a team leader perceives his/her alienation with team workers who show quality social interaction in their own circle, it may be a warning signal for the leader not to focus much on dominance-focused leadership. Management trainees (i.e., candidates for being promoted as team leaders) should be encouraged to be an effective leader by balancing diverse kinds of leadership skills. Leadership skills can be taught, and to some extent the perspectives of leadership can be also developed and enhanced through training and education based on the findings of this study.

Given the positive moderation of team learning behavior for the relationship between social interaction and team performance, enhancing team learning behavior is a prioritized issue for team leaders to successfully leverage social interaction to boost team performance. For that reason, team leaders should apply their resources to effectively impart clear expectations and benchmarks about team learning in order to encourage team learning behavior. Team leaders should work on tactics (e.g., workshops that emphasize social and instrumental purposes) and collective learning

guidelines (e.g., feedback and collaborativeness) to strengthen social interaction and team learning behavior at the same time to accelerate team performance.

Regarding the negative moderation of team learning goal orientation between adaptation and team performance, team leaders should recognize that it is particularly important to encourage team learning goal orientation when team workers are relatively weak in terms of adaptation. In other words, if team workers can coordinate their competitive capability to handle complicated things with high team learning goal orientation, teamwork and performance are unlikely hindered by adaptation. Consequently, team performance is likely enhanced.

The insignificant relationship between discipline-focused leadership and social interaction that resulted in unsupported H4 might occur because discipline-focused leadership required team members to strictly follow the rules, regulations, and objectives regardless of interpersonal relationship quality. For that reason, such leadership was less likely to influence social interaction. The insignificant relationship between dominance-focused leadership and adaptation that resulted in unsupported H5 might occur because dominance-focused leadership could have double-edged effects on adaptation depending on the leader's competence. For example, dominance-focused leadership by a highly competent leader might develop a high quality SOP (Standard Operation Procedure) for team workers to follow, which made team workers more adaptive with effective SOP guidelines. With regard to unsupported H7, the effect of adaptation on team performance was not affected by team learning behavior perhaps because team learning behavior did not necessarily intensify adaptable resources but rather pertained merely to information-seeking and reflective decision-making processes (Hirst et al., 2009). With regard to unsupported H10, the effect of social interaction on team performance was not affected by team learning goal orientation because learning goal mainly focused on job skills irrelevant to social skills (Sinatra & Pintrich, 2003).

In summary, team performance cannot be arbitrarily achieved by an immediate decree of management, but rather it can be obtained after appropriate leadership is demonstrated to guide team workers. The view of multiple leadership styles in this study complements industry practices that mostly focus on a single leadership style to motivate team performance without recognizing the necessity of divergent leadership. By understanding different types of leadership in this study, team leaders are likely to tailor sound teamwork strategies or tactics to increase team performance.

Limitations and Future Research

This study has two noticeable limitations that may imply directions for future research. The first limitation is its generalizability, due to the highly delimited nature of the sample from high-tech industry in Taiwan. The empirical findings based on such a sample may not be highly generalizable to work teams from banking, tourist, or transportation industry. Second, the cross-sectional investigation of this study may limit its ability to accurately interpret temporal and causal connections across time. Third, due to its theoretical foundation based on theory of group leadership, this study did not address economic or political variables (e.g., information asymmetry, adverse selection, or politics) to explain team performance. To sum up, future

scholars may investigate more diverse work teams across various industries with multiple-wave investigations, combine novel theories to derive more holistic nomological networks, and interviewing work teams longitudinally so that a variety of new leadership styles can be demonstrated.

Appendix A. Measurement Items

Variables measured by team leaders

Social interaction (Source: Tsai et al., 2014)

1. We have close social relationships among our team coworkers.
2. We spend a lot of time interacting with our team coworkers.
3. We have frequent contact with our team coworkers.
4. We feel strong cohesiveness in the team.

Team learning goal orientation (Source: Mehta & Mehta, 2018)

1. My team likes challenging and difficult assignments that teach new things.
2. My team is willing to take risks on new ideas in order to find out what works.
3. My team likes to work on things that require a lot of skill and ability.

Team performance (Source: Schaubroeck et al., 2007)

1. Our team has good job productivity.
2. Our team gets its work done very effectively.
3. Our team has performed its job well.
4. Our team results were of high quality.
5. Our team continuously improves job efficiency.

Variables measured by team members

Charismatic leadership (Source: Wilderom et al., 2012)

Our team leader…

1. Exudes competence in their words and actions.
2. Exhibits extraordinary competence in their undertakings.
3. Gives employees the feeling that management can overcome any obstacle.
4. Projects a powerful, dynamic, and magnetic presence.
5. Mobilizes a collective sense of mission.
6. Communicates a clear vision of the future.
7. Engenders complete confidence in management.
8. Makes employees aware of important values, ideals, and aspirations that affect the bank and employees alike.
9. Talks about the future with optimism.
10. Demonstrates a strong conviction in their beliefs and values.

Discipline-focused leadership (Source: Chou & Cheng, 2014; Chou et al., 2010)

1. Our team leader urges for work progress and asks us to do our level best.
2. Our team leader insists that we follow the team's regulations and rules.
3. Our team leader strictly maintains work principles and does not allow us to violate them.
4. Our team leader asks that our performance cannot be lower than the preset performance level.
5. Our team leader asks us to follow the team's core norms.
6. 6.Our team leader asks us to report to him/her when there is a change in our scheduled progress.
7. Our team leader knows very well about the details of our job executions.
8. Our team leader keeps an eye on the status of our job execution.

Dominance-focused leadership (Source: Chou & Cheng, 2014; Chou et al., 2010)

1. Our team leader degrades the contribution of our work.
2. Our team leader looks down upon our ability of doing things.
3. The ideal subordinate in our team leader's mind obeys his or her instructions.
4. Our team leader usually does not let us know his real intention.
5. Our team leader requests us to completely follow his leadership.
6. In meetings, our team leader asks us to make a decision based on his/her idea.

Adaptation (Source: LePine, 2003)

1. Our team members are good at adapting themselves to accomplish the team's works.
2. Our team members can adapt to change requirements for the team's work.
3. Our team members can adjust what they did to accommodate other members' work needs.
4. Our team members can settle into a smooth pattern of communicating necessary information.
5. Our team members can quickly modify the way of performing their work.
6. Our team members can find appropriate ways to do their work.

Team performance (Source: Schaubroeck et al., 2007)

1. Our team has good job productivity.
2. Our team gets its work done very effectively.
3. Our team has performed its job well.
4. Our team results were of high quality.
5. Our team continuously improves job efficiency.

Team learning behavior (Source: Edmondson, 1999)

1. Team members go out and get all the information they possibly can from others–such as customers, or other parts of the organization
2. This team frequently seeks new information that leads us to make important changes.
3. We invite people from outside the team to present information or have discussions with us.

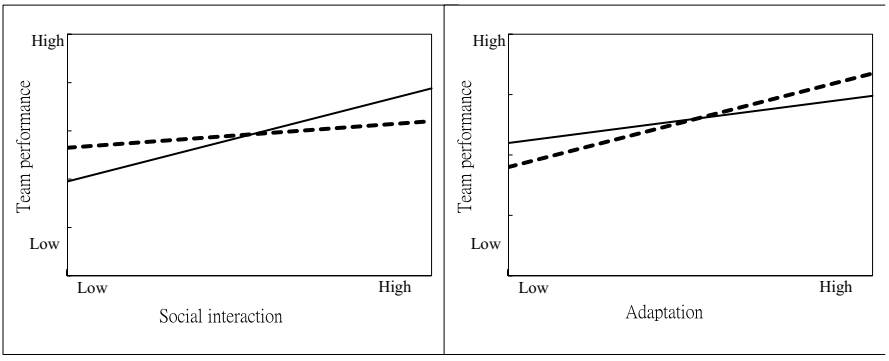
Appendix B. Team-level Correlation Matrix

	Mean	S.D	1	2	3	4	5			
1	3.89	0.63	1.00							
2	4.07	0.46	0.59**	1.00						
3	2.45	0.84	-0.22	-0.33**	1.00					
4	4.05	0.48	0.68**	0.69**	-0.31**	1.00				
5	4.13	0.51	0.59**	0.60**	-0.33**	0.62**	1.00			
6	3.75	0.80	0.28**	-0.03	0.34**	-0.03	0.17	1.00		
7	2.08	0.90	0.02	-0.15	0.46**	-0.08	-0.20	-0.01	1.00	
8	4.18	0.42	0.46**	0.54**	-0.26*	0.60**	0.57**	0.28*	-0.36**	1.00

* $p < 0.05$; ** $p < 0.01$

1 = Charismatic leadership; 2 = Discipline-focused leadership; 3 = Dominance-focused leadership; 4 = Team adaptation; 5 = Team learning behavior; 6 = Social interaction; 7 = Team learning goal orientation; 8 = Team performance

Appendix C. The Graphs of Supported H8 and H9



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Declarations

Conflicts of Interests/Competing Interests The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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