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Team Leader’s Conflict Management Style and Team Innovation Performance in Remote R&D Teams—With Team Climate Perspective

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Abstract: Remote work has become a new way of working due to the influence of the COVID-19 pandemic, which inevitably aggravates team conflicts caused by cognitive differences given the lack of face-to-face communication. With a team climate perspective, this paper investigates the impact of the team leader’s conflict management style on team innovation performance in remote R&D teams in China based on social cognition theory and two-dimension theory. A theoretical model is constructed which describes the mediating effect of team psychological safety and the moderating impact of team trust. Paired data from 118 remote R&D teams in China including 118 leaders and 446 members were collected. The results show that team leader’s cooperative conflict management style is conducive to enhancing team psychological safety and further effectively improves team innovation performance. Therefore, team psychological safety has a mediating effect between team leader’s cooperative conflict management style and team innovation performance. In addition, team trust has a negative moderating effect between team leader’s cooperative conflict management style and team psychological safety. Besides, this study obtains some valuable culture-related insights and provides more views for conflict management research in the cross-cultural context since the samples in this study are from China, a society with high collectivism, which is different from the western cultural context from which many conflict management theories develop.

Keywords: cooperative conflict management style; competitive conflict management style; team innovation performance; team psychological safety; team trust

1. Introduction

The supply-side reform proposed by the Chinese government has made the past mode of production, relying on economies of scale, lose its profit motive force and the national policy of “mass entrepreneurship and innovation” proposed in 2014 has also been further advancing; these both declare that innovation has become a new engine to promote Chinese economic development. Therefore, if enterprises want to develop continuously, they need to innovate products and technologies constantly. In order to enhance the ability to cope with the changing external environment, more and more enterprises are adopting the work mode with the team as the smallest unit, and scholars have begun to investigate the influencing factors of team innovation performance (TIP) [1]. Considering the key role of R&D teams in the innovation process of enterprises, some scholars argue that exploring the influencing factors of R&D teams’ innovation performance cannot be ignored [2–4]. Previous research has analyzed the influencing factors in R&D teams’ innovation performance from the perspective of sustainability, knowledge sharing and integration, taking face-to-face R&D teams as research subjects [3,4]. However, due to the influence of COVID-19 pandemic, working remotely has become a new way of working [5,6]. Therefore, it is necessary to probe the antecedents of remote R&D teams’ innovation performance.
Remote R&D teams consist of individuals with diverse background, preferences, needs and interests, personal behavior standards and norms, values and ethics [7], which results in the emergence of conflicts within the team inevitably. Conflict is neither good nor bad, but how conflict is handled determines its influences [8]. Effective conflict management is able to improve team performance and cohesion, while ineffective conflict management leads to ineffective behavior and lower team productivity [9–11]. Team leaders are the key and foremost player in remote R&D teams since 45% to 65% of the variance in organizational success or failure is determined by them [12]. Hence, it shows that team leaders play a decisive role to deal with conflicts, which is especially the case for a culture with high-power distance like China [13]. Therefore, we infer that conflict management styles (CMSs) adopted by team leaders have a noticeable effect on remote R&D teams’ innovation performance.

Two-dimension theory proposed by Ohio State University suggests that leadership behavior is able to be considered from two-dimensions of “initiating structure” and “consideration”. “Initiating structure” refers to leadership behavior that focuses directly on achieving organizational performance, with more emphasis on leaders’ impact on organizational ability. Whereas “consideration” refers to the degree of respect, trust and mutual understanding that leaders give to members, which enables organizational climate shaping. It can be deduced that team leader’s conflict management style, as a typical leadership behavior, has an impact not only on team ability but also on team climate. By now, most of the existing literature concentrates on the direct effect of CMSs on team performance [9–11]. Some literature has probed the mediating mechanism of CMSs on TIP with team ability perspective involving mediating variables such as team effectiveness [14] and team reflexivity [15] rather than from the perspective of team climate shaping. Therefore, it is meaningful to investigate the mechanism of CMS adopted by leaders for team innovation performance from the latter perspective.

Team psychological safety (TPS) is the critical team climate factor in remote R&D teams. It is defined as the “shared belief that the team is safe for interpersonal risk taking” [16]. Perceptions of TPS come from the trust and respect among employees, which make employees willing to speak out without worrying about being punished or embarrassed [17]. Scholars have carried out research on psychological safety in innovation fields and think that psychological safety has effects on the work outcomes related to innovation, such as creativity [18,19]. Research has indicated that a leader’s behavior significantly influences team psychological safety [20,21]. Therefore, it is proposed that conflict management style, as one of typical leadership behavior in harmonizing team activities, plays a key role in TPS.

In addition, team trust refers to a kind of consensual perception; that is, team members are willing to accept the vulnerability of others and have an active expectation for the credibility of colleagues’ behaviors and intentions [22,23], which is a typical factor contributing to team climate shaping. Edmondson [24] propose that trust between team members is closely related or complementary to members’ psychological safety, and Oh et al. [25] also prove that trust positively affects psychological safety. Some other scholars introduce team trust as a moderating variable in team studies [26–29]. In view of the significant effect of team trust in managing TPS and building team climate, this paper will investigate how team trust moderates the relationship between team leader’s CMS and TPS.

In conclusion, this manuscript aims at exploring the mediating mechanism of team leader’s conflict management style on team innovation performance and to determine the boundary condition of these impacts caused by team leader’s CMS based on social cognition theory and two-dimension theory with a cognitive perspective. The results of this paper can make the following contributions to existing studies of conflict management and remote R&D teams. First of all, this paper investigates team leaders’ vital impacts on remote R&D teams and contributes to develop existing theoretical studies on leadership behavior. Then, this paper is conducive to theorizing on the relationships between team leader’s CMS and team innovation performance. In addition, through probing the mediating impact of TPS, this paper is helpful to better comprehend the mediating mechanisms of team leaders’
CMS on team innovation performance and expand the studies between them. At last, according to investigating the moderating impact of team trust between CMS and TPS, this paper illustrates how team trust has the impact on conflict management within remote R&D teams. The results are helpful to theory development on team trust and promote the research on remote R&D teams.

The following is the structure of this paper. Section 1 illustrates the research background, values and possible contributions to the existing related literature. Section 2 provides hypotheses and proposes theoretical models after reviewing the literature. Section 3 discusses the method in this paper. Then Sections 4 and 5 are about the results and discussions. At last, Section 6 gives descriptions of theoretical and managerial implications, research limitations and future research directions.

2. Literature Review and Hypotheses

The related research on conflict management are usually in view of management grid theory proposed by Blake and Mouton. Rahim [30] classifies the conflict management model into five styles: integrating, dominating, avoiding, obliging and compromising. Among them, obliging and avoiding are both aimed at reducing differences between the two sides of conflict through indirect and roundabout methods. Integrating and compromise conflict management styles emphasize common interests of both sides to accomplish the purpose of calming the contradictions. Tjosvold et al. [31] divide CMSs into cooperative, competitive and avoidant styles. Cooperative conflict management style assumes that both sides of conflicts are “win-win”, which means trying to integrate the interests of both sides, forming a best solution in common and striving to achieve satisfactory results. Competitive conflict management style assumes that both parties to conflicts are “zero-sum”, which shows that the power of one party to dominate others, that is, only consider one party’s interests rather than others. The fundamental purpose of individuals (groups) adopting this style is to maximize their own interests. Avoidant conflict management style is characterized by smoothing conflict, and usually adopting indifferent ways to avoid conflict. With continuous decentralization of organizational power, the team leader has absolute control over the resources such as people, money, and things in the team. When team leaders’ conflict with team members as participants, they usually adopt active rather than passive conflict management styles. Thus scholars usually select cooperative and competitive conflict management styles to conduct related research [9,10,32–34]. Therefore, this paper will focus on the cooperative and competitive conflict management styles of team leader.

2.1. Team Leader’s Conflict Management Style and Team Psychological Safety

The previous research on the role of CMSs mainly explore its impacts on individual (team) performance [32,35] and employee behaviors including voice behavior [36] and innovation behavior [11]. Recently, many scholars have begun to focus on the team climate in the office [37,38]. TPS, as the perception of team climate [17], can affect the willingness of team members to put forward new views and methods. Some scholars probe whether and how conflict management affects psychological safety [17,39]. Therefore, it is necessary to ponder the relationship between conflict management and TPS within teams, so as to investigate the greater value of conflict management to team development.

According to social cognition theory, individuals can create different climates through their own subjective characteristics, such as behavior. As a kind of leadership behavior, a team leader’s conflict management style can shape a typical team climate of TPS. The definition of psychological safety is “shared belief that the team is safe for interpersonal risk taking” [16]. Cognition of TPS comes from mutual trust and respect where members believe that they can speak freely without being punished or embarrassed [17]. The signal released by team leaders who adopt cooperative conflict management style is that team members share common goals and have the same interests. Team leaders encourage members to put forward mutually beneficial solutions through adequate communication and discussion. It can make members aware that they are safe within teams and will
not be embarrassed, rejected or punished for expressing their true opinions, which can increase team psychological safety. However, team leaders who adopt competitive conflict management style tend to impose their personal views and wishes on team members, and they cannot tolerate the inconsistency between members and themselves. Hence, members are afraid of expressing different opinions from team leaders, which may lead them embarrassed, rejected or punished. In the long run, it is not conducive to shaping team psychological safety. According to the analyses above, hypotheses are as follows:

**Hypothesis 1.** Team leader’s CMS significantly affects team psychological safety.

**Hypothesis 1a.** Team leader’s cooperative CMS positively affects TPS.

**Hypothesis 1b.** Team leader’s competitive CMS negatively affects TPS.

2.2. Team Psychological Safety and Team Innovation Performance

Social cognition theory holds that climate often strongly dominates and guides individual’s behaviors and results. The core idea of team psychological safety is to make employees think that taking interpersonal risks within the team is safe and they will not be rejected and punished due to expressing their true personal opinions [17]. The enhancement of TPS makes team members believe that they will not be excluded or punished when they constantly put forward new ideas and methods, further triggering the generation of team innovation behaviors, thus improving team innovation performance. Some scholars have probed the significant effects of TPS on team innovation through empirical research. Edmondson [16] proposes that TPS positively affects team innovation by inspiring team members to achieve the goal of group learning. Baer and Frese [40] suggest that TPS is the moderating variable between process innovation and team performance. Tang [41] proposes that TPS positively impacts the realization of team innovation. According to the analyses above, we put forward hypotheses:

**Hypothesis 2.** TPS positively affect team innovation performance.

2.3. The Mediating Role of Team Psychological Safety

Existing studies generally link leadership behavior with innovation [42,43]. Feng [44] and Zhang et al. [45] prove that transformational leadership significantly influences on team innovation performance. Zhao [46] indicate that patriarchal leadership significantly affects interdisciplinary team innovation performance. Zhang [47] believe that inclusive leadership affects innovation performance in discipline service teams. Therefore, it can be concluded that team leader’s CMS, as a manifestation of leadership behavior, also has an effect on innovation performance [13].

Empirical research proved that cooperative conflict management styles can effectively solve interpersonal conflicts [9]. Under the influence of cooperative CMS, team leaders focus more on the common goals of team and advocates adequate communication when conflicts occur, thus, team members are willing to put forward new ideas and solutions which make the relationship between the two conflict parties closer. Some scholars confirmed that the team leader’s cooperative CMS positively influences team innovation performance [10,48]. On the contrary, leaders who adopt competitive conflict management style within teams tend to impose personal opinions on team members. After being suppressed, team members in passive position gradually reduce the extent to which they voice their real opinions which leads to team lack of vigor and vitality and difficult to produce new ideas and schemes. Several scholars also confirmed that team leader’s competitive CMS negatively influences team innovation performance [10,14].

Based on social cognition theory, individuals are able to arouse various climates through their own subjective characteristics, and climates further control individual’s behaviors. TPS, as a typical cognitive team climate, can be a potential mediator. Leaders
who adopt cooperative conflict management style care about the views of both parties of the conflict are willing to consider different opinions of team members and hope to form the best solution through satisfying both interests. Thus, they will try their best to create a relaxed and free climate, which favors improving team psychological safety, then further encourages team members to put forward new ideas and methods, thus enhancing team innovation performance. Consequently, we conclude that cooperative CMS positively influences team innovation performances by improving team psychological safety. By the same token, competitive CMS reduces team innovation performance by inhibiting team psychological safety. According to the above analysis and hypothesis 1 and 2, hypothesis 3 is as follows:

**Hypothesis 3.** *TPS mediates the relationship between team leader’s CMS and team innovation performance.*

### 2.4. The Moderating Role of Team Trust

Team trust refers to employees’ positive attitude towards teams, which is the foundation of team cooperation [49]. Team trust helps enhance communication and cooperation among employees, promote information sharing and deep cooperation among employees. This kind of active interaction among team members reduces their awareness of risks, thus improves the psychological safety of the team. Burt et al. [50] prove that the trust of entering process plays a negative role in the perceived risk of new members. The existing literature also proves that team trust with high level increases psychological safety of team members [50,51].

According to contingency theory, team trust, as a positive team climate, affects the influence of conflict management style adopted by the leader on team psychological safety. High levels of team trust can promote members’ communication, improve team cohesion and urge team members to take a positive attitude towards events in the team. Based on social information processing theory, if leaders adopt cooperative conflict management style when team trust is high, members will exaggerate the signal of “encouraging communication and exchange to produce the best plan for mutual benefit” released by team leaders, so that team psychological safety will be greatly improved. That is, team trust strengthens the connection between leader’s cooperative CMS and TPS. Similarly, if team leaders adopt competitive conflict management styles at high level of team trust, team members’ negative reactions to the strong and oppressive way adopted by team leaders in dealing with conflicts will be reduced to a certain extent, thus the decline degree of TPS will be weakened. That is, team trust weakens the connection between a team leader’s competitive CMS and team psychological safety. According to the analyses above, we put forward the following hypotheses:

**Hypothesis 4.** *Team trust moderates the relationships between team leader’s CMS and TPS.*

**Hypothesis 4a.** *Team trust enhances the effect of team leader’s cooperative CMS on TPS.*

**Hypothesis 4b.** *Team trust weakens the effect of team leader’s competitive CMS on TPS.*

The research model is shown in Figure 1.

![Figure 1. The proposed model of this paper.](image-url)
3. Method

3.1. Sample and Data Collection

We chose remote R&D teams from different industries in China and adopted the leader-member pairing method to distribute questionnaires in this paper. Because of different size of work teams, each team surveyed a team leader and 3–6 team members. We used three items to match leaders and members, such as asking team leaders “your last name” and asking team members “the last name of your leader”. The questionnaire is anonymous to ensure that the questionnaire truly reflects the respondents’ views. Team leaders answered the questionnaire about CMSs and team members answered the questionnaire about TPS, team trust and team innovation performance.

After rejecting invalid questionnaires (with incomplete data), there were 564 effective surveys in the sample pool, including 118 leaders and 446 members in the team. For team leaders, 81.36% respondents were male and 57.63% respondents were between 26 and 35 years. Among them, 63.56% respondents possessed a bachelor’s degree, which was the most. In addition, respondents who had been working for 5 to 10 years accounted for 45.76%. At the level of team members, 71.08% respondents were male and 55.38% respondents were between 26 and 35 years. Among them, 66.36% respondents possessed a bachelor’s degree, which was the most. In addition, respondents who had been working for zero to five years was the most, arriving 42.06%.

3.2. Measures

The scales in the questionnaire were all international established scales. In order to guarantee the same meaning, we translated all scales into Chinese and back into English [52]. The questionnaire was scored by Likert five-point method.

3.2.1. Conflict Management Styles

The scale suggested by Tjosvold et al. was selected in this paper. Ref. [53] to measure cooperative and competitive CMS. The scale contained 12 items in total, including 7 items to measure cooperative conflict management style and 5 items to measure competitive conflict management style. Examples were “I try to investigate an issue with my colleague to find a solution acceptable to us” and “I use my authority to make a decision in my favor”.

3.2.2. Team Psychological Safety

TPS was measured by Edmondson’s 7-item scale [16], including “If you make a mistake in this team, it is often held against you” and “It is safe to take a risk in this team”.

3.2.3. Team Innovation Performance

As the respondents were team leaders and members in remote R&D teams, we used and adjusted the scale proposed by Madjar et al. [54] with 6 items. Items included “My team uses previously existing ideas or work in an appropriate new way” and “My team easily modifies previously existing work processes to suit current needs”.

3.2.4. Team Trust

We used a 4-item team trust scale proposed by McAllister [55] based on cognition. Items included “I can rely on this person not to make my job more difficult by careless work” and “This person approaches his/her job with professionalism and dedication”.

3.2.5. Control Variables

The variables that had potential impact on the research results, such as gender, working years, age and education level of leaders and working years, average age and average education level of teams [30,56,57], were set as control variables.
4. Data Analysis and Results

We adopted SPSS 24.0 to test descriptive statistical analysis and reliability and AMOS 24.0 to perform the differentiation Validity Test in this manuscript [58]. In the hypotheses testing phase, we adopted Mplus8.0 to undertake the multiple regression analysis [59] and test the significance of indirect effects in order to support the mediation hypothesis [60]. Finally, we adopted a bootstrapping method proposed by Grant & Berry [61] to avoid the matter of multicollinearity. Specifically, we repeatedly extracted 5000 values of a*b from the primary data and appraise the unbiased interval.

Table 1 summarized the means, variances, correlation coefficients and reliability test results for each major variable. According to Table 1, all variables’ Cronbach’s α is over 0.7, so each scale has good reliability.

Table 1. Descriptive statistical analysis and reliability.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative conflict management</td>
<td>1.39</td>
<td>0.44</td>
<td>0.880</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitive conflict management</td>
<td>3.09</td>
<td>0.73</td>
<td>−0.211*</td>
<td>0.884</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team psychological safety</td>
<td>1.65</td>
<td>0.48</td>
<td>0.217*</td>
<td>0.120</td>
<td>0.957</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team trust</td>
<td>1.55</td>
<td>0.41</td>
<td>0.276**</td>
<td>0.118</td>
<td>0.816**</td>
<td>0.896</td>
<td></td>
</tr>
<tr>
<td>Team innovation performance</td>
<td>1.63</td>
<td>0.48</td>
<td>0.264**</td>
<td>0.057</td>
<td>0.719**</td>
<td>0.813**</td>
<td>0.943</td>
</tr>
</tbody>
</table>

Note: * p < 0.05; ** p < 0.01.

4.1. Structural Validity

As the scales derived from different subjects, it is necessary to measure their structural validity. We used AMOS 24.0 in this manuscript. The results are shown in Table 2. At the level of team member, the three-factor model was fitting best ($\chi^2/df = 3.56$, GFI = 0.89, CFI = 0.96, NFI = 0.95, RMSEA = 0.08). It was superior to a single-factor model (combined TPS, team trust and TIP) and two-factor models (combined TPS, team trust and TIP in pairs). At the level of team leader, the two-factor model was fitting better ($\chi^2/df = 1.31$, GFI = 0.90, CFI = 0.97, NFI = 0.90, RMSEA = 0.06), which is superior to single-factor model.

Table 2. Differentiation Validity Test of Different Source Scales.

<table>
<thead>
<tr>
<th>Level</th>
<th>Model</th>
<th>Factor</th>
<th>$\chi^2/df$</th>
<th>GFI</th>
<th>CFI</th>
<th>NFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team member</td>
<td>Single-factor</td>
<td>TPS+TT+TIP</td>
<td>9.71</td>
<td>0.67</td>
<td>0.86</td>
<td>0.85</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>Two-factor</td>
<td>TPS+TT, TIP</td>
<td>4.90</td>
<td>0.85</td>
<td>0.94</td>
<td>0.92</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>Three-factor</td>
<td>TPS, TT, TIP</td>
<td>3.56</td>
<td>0.89</td>
<td>0.96</td>
<td>0.95</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>Single-factor</td>
<td>COO+COM</td>
<td>6.53</td>
<td>0.52</td>
<td>0.51</td>
<td>0.48</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>Two-factor</td>
<td>COO and COM</td>
<td>1.31</td>
<td>0.90</td>
<td>0.97</td>
<td>0.90</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Note: TPS = team psychological safety, TT = team trust, TIP = team innovation performance, COO = cooperative conflict management style, COM = competitive conflict management style.

4.2. Data Convergent Testing at the Team Level

Since the variables at the level of team member were all evaluated by different individuals, we calculated the convergent validity to confirm whether the data was able to aggregate at team level. For team psychological safety, ICC(1) = 0.18, ICC(2) = 0.50, Rwg = 0.93. For team trust, ICC(1) = 0.17, ICC(2) = 0.47, Rwg = 0.95. For team innovation performance, ICC(1) = 0.23, ICC(2) = 0.57, Rwg = 0.93. Consequently, these variables can be aggregated at team level.

4.3. Hypotheses Test

Regression model 1 was used to test variance inflation factor (VIF) to prevent multicollinearity. Dependent variable was TIP and independent variables were cooperative and competitive CMSs, team psychological safety, team trust and all control variables. All VIF
values are less than 5, illustrating that there was no multicollinearity problem. See Table 3 for the results.

Table 3. Structural equation model test.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TIP(VIF)</td>
<td>TPS</td>
<td>TIP</td>
<td>TIP</td>
<td>TPS</td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leader’s gender</td>
<td>0.169 (1.217)</td>
<td>0.194</td>
<td>0.035</td>
<td>0.037</td>
<td>0.111</td>
</tr>
<tr>
<td>Leader’s working years</td>
<td>0.041 (2.541)</td>
<td>0.210</td>
<td>−0.086</td>
<td>−0.098</td>
<td>0.230 *</td>
</tr>
<tr>
<td>Leader’s age</td>
<td>−0.324 * (1.883)</td>
<td>−0.284 *</td>
<td>−0.135</td>
<td>−0.134</td>
<td>−0.14 *</td>
</tr>
<tr>
<td>Leader’s education level</td>
<td>0.069 (1.377)</td>
<td>−0.031</td>
<td>0.127</td>
<td>0.095</td>
<td>−0.038</td>
</tr>
<tr>
<td>Team working years</td>
<td>0.086 (4.243)</td>
<td>−0.183</td>
<td>0.206</td>
<td>0.211</td>
<td>−0.351 **</td>
</tr>
<tr>
<td>Team average age</td>
<td>0.048 (3.241)</td>
<td>0.301 *</td>
<td>−0.161</td>
<td>−0.155</td>
<td>0.207 *</td>
</tr>
<tr>
<td>Team average education level</td>
<td>0.218 * (1.388)</td>
<td>0.011</td>
<td>0.192</td>
<td>0.117</td>
<td>0.004</td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COO</td>
<td>0.294 ** (1.116)</td>
<td>0.261 **</td>
<td>0.208 *</td>
<td>−0.006</td>
<td></td>
</tr>
<tr>
<td>COM</td>
<td>0.141 (1.203)</td>
<td>0.231</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mediating variable</strong></td>
<td></td>
<td></td>
<td>0.713 ***</td>
<td>0.686 ***</td>
<td></td>
</tr>
<tr>
<td>TPS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Moderating variable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.871 ***</td>
</tr>
<tr>
<td>TT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interactive variable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>−0.114 **</td>
</tr>
<tr>
<td>COO × TT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * p < 0.05; ** p < 0.01, *** p < 0.001, TPS = team psychological safety, TT = team trust, TIP = team innovation performance, COO = cooperative conflict management style, COM = competitive conflict management style.

4.3.1. Test of Direct Effects

After controlling all controlled variables, we obtained the regression results of different independent variables to dependent variables in Table 3. In Model 2, two conflict management styles were independent variables and team psychological safety was the dependent variable. We found that cooperative conflict management style positively affected team psychological safety (b1 = 0.261, p < 0.01), H1a was supported; while competitive conflict management style did not significantly affect team psychological safety (b2 = 0.231, p > 0.05), which not supported H1b. In Model 3, team psychological safety was independent variables and team innovation performance was dependent variable. In model 3, the result indicated that TPS significantly affects team innovation performance (b3 = 0.713, p < 0.001), and H2 was supported. Because competitive conflict management style was not significant in Model 2, it was unnecessary to go on analyzing the mediating effect of TPS between competitive CMS and TIP, likewise the moderating effect of team trust between competitive conflict management style and TPS. Thus, we didn’t put the competitive conflict management style in Model 4 and Model 5. The path coefficient b4 was 0.208 (p < 0.05) and b5 was 0.686 (p < 0.001) in model 4, and H3 was preliminarily supported. The path coefficient b6 between interaction variables and TPS was −0.114 (p < 0.01), which was opposite to H4a.

4.3.2. Test of Indirect Effects

Then, we adopted bootstrapping to verify the indirect effects’ significance and the confidence interval. It can be seen from the above that both b1 and b3 were significant. Then we repeated sampling 5000 times; the mediating role of TPS between cooperative CMS and TIP was significant (b1*b3 was [0.021, 0.357], excluding 0), which confirmed H3.

At last, this paper probed the moderating role of team trust, we adopted the method proposed Aiken and West. Saw Figure 2 for the results. In Figure 2, we found that whether the level of team trust was high or low, team leaders’ cooperative CMS positively affects...
TPS. In addition, the team trust was higher, the positive effect of team leaders’ cooperative CMS on TPS was weaker ($b_7 = -0.234, p < 0.05$).

![Figure 2. Cooperative style × team trust impact on team psychological safety.](image)

4.4. Discussion

It is indicated that the team leaders’ cooperative CMS is beneficial for enhancing team psychological safety and further effectively improves team innovation performance. This is because cooperative conflict management style requires both parties involved to solve the conflict through open, cooperative, peaceful and friendly methods. It can not only help create a strong team psychological safety, but also mobilize the working motivation of teams. The results also confirm that TPS positively influences team innovation performance. For indirect impacts, first of all, TPS has a mediating effect between cooperative CMS and TIP. Then, team trust moderates the relationship between cooperative CMS and team psychological safety. Nonetheless, some hypotheses are not supported.

First of all, there is no significant relationship between team a leader’s competitive CMS and team psychological safety, which may relate to the sample data derived from Chinese enterprises. Since Chinese culture has a high power distance, people are able to accept the absolute authority of leaders and follow their orders. It is quite common to accept a leader’s competitive CMS when confronting conflicts. Therefore, competitive CMS adopted by team leaders may not have a negative effect on team climate. In addition, Confucian culture puts forward the idea of “harmony is most precious”, so team members usually would like to solve conflicts as soon as possible, and they are not concerned about the specific conflict management styles adopted by leaders.

Secondly, this paper shows that team trust weakens the effect of team leaders’ cooperative CMS on team psychological safety, it is against our hypothesis. Possible reasons are as follows. On the one hand, leaders have a critical effect on the team and their behaviors are important to shape team psychological state. Zhang [62] (2009) demonstrates that, compared with favorable circumstances, leaders are more able to play a key role in adverse circumstance. It can be deduced that when team trust is low, meaning that the circumstance is rather adverse, a team leader’s behavior will have a stronger impact on the team psychological state. On the other hand, there is less space for team leaders to improve team psychological safety since the latter has been at a higher level in the case of high rather than low team trust.

5. Conclusions and Implications

With a cognitive perspective, this paper investigates the mechanism through two typical conflict management styles: they affect team innovation performances and also analyze the mediating impact of TPS and the moderating impact of team trust. By collecting 118 matching data for testing, we found that the team leader’s cooperative CMS is able
to enhance team psychological safety, and further effectively improves team innovation performance. This is to say, team psychological safety plays the mediating effect between the team leader’s cooperative CMS and TIP. Furthermore, this paper discovers team trust moderates the relationship between team leaders’ cooperative conflict management style and team psychological safety as well.

5.1. Theoretical Implications

Firstly, this study introduces the team leader’s CMS into the research of remote R&D teams. Most existing studies on telecommuting are conducted in terms of the impacts of telecommuting on job outcomes, such as performance and work efficiency [63–65]. In recent years, there are also a several studies which explore the influences of leadership behavior on telecommuting workers. Magnavita et al. [66] verifies that intrusive leadership significantly increases the pressure of workaholic workers in telecommuting. Wortler et al. [67] investigates the relationship between empowering leadership style and psychological needs of telecommuting workers. To this point, there is no research to probe whether and how leadership behavior affects the team atmosphere in telecommuting. Maher [68] propose that it is difficult but necessary to shape positive team climate in remote teams given lack of face-to-face communication. Therefore, this study takes team leaders’ CMS as a breakthrough point and investigates how it affects remote R&D teams’ innovation performance through the shaping of team climate. By linking leader’s behavior with telecommuting, this study enriches and expands the research scope of telecommuting.

Secondly, this study investigates the mechanism of leader’s CMS on TIP with team climate perspective and confirms the mediating effect of team psychological safety between them. From the cognitive perspective, previous studies on the impact of CMS adopted by team leaders mostly investigate the mediating effect of individual ability or team ability [14,15]. However, there are also several studies which probe the mediating effect of team climate. Sahoo et al. [69] examines the mediating role of trust between CMS and employee relations. Recently, scholars discovered that TPS is an important variable of team climate and has a significant impact on team outcomes [70,71]. This manuscript explores the mediating effect of TPS between team leader’s CMS and TIP according to social cognition theory and two-dimension theory, which expands the studies on the mechanism of CMS on team outcomes and enriches the current literature on conflict management to some extent.

Thirdly, this paper confirms the moderating influence of team trust between the team leader’s CMS and team psychological safety. Some scholars confirm that team trust positively affects psychological safety [50,51], but few scholars probe its moderating effect between leader’s behavior and team climate. Team trust refers to a kind of consensual perception; that is, team members are willing to accept the vulnerability of others and have an active expectation for the credibility of colleagues’ behaviors and intentions [22,23], which is a typical factor contributing to team climate shaping. Kao [27] demonstrates that the mutual effect of team trust and team leader’s behavior is able to influence team climate. Consequently, this paper introduces team trust as a moderating variable to investigate the boundary that team leader’s CMS has impacts on team psychological safety, and the result is helpful to determine the boundaries on which the team leader’s CMS can exert an influence and provide a significant supplement to conflict management research.

Lastly, the samples in this paper are from China, a highly collectivistic society [72], which is different from the western cultural context within which conflict management theories develop. With the unprecedented economic explosion in the world, China has grown into a popular emerging markets for the West [73]. Thus, it is necessary and meaningful for scholars to examine conflict management dynamics in such a typical eastern cultural context. Some scholars explore the mechanism of CMSs on team outcomes such as job satisfaction [74] and team effectiveness [75] in the context of Chinese culture. This study probes the mechanism by discussing team leader’s CMS impacts on TIP in the context of eastern culture and obtain some valuable cultural-related insights. Consequently, this study provides more views for conflict management research at the international level.
5.2. Managerial Implications

First of all, this paper demonstrates the significant effect of conflict management styles in remote R&D teams. Team leaders with cooperative conflict management style can create a relaxed and free communication climate, which strengthens members’ willingness to share their true ideas, helps improve TPS and promotes team innovation performance. Therefore, team leaders should make an effort to use cooperative rather than competitive CMS to handle team conflicts in remote R&D teams which lack face-to-face communication.

Secondly, this study verifies that TPS positively impacts team innovation performance. Team psychological safety promotes members’ willingness to actively communicate, which is specifically important to improve team innovation performance. As mentioned, it is difficult to create a positive team climate for remote R&D teams [66]. Therefore, team leaders should try their best to promote team psychological safety, which is a critical factor of positive team climate. Possible methods include satisfying the independent expressive needs of team members, permitting team members to make mistakes, and providing team members sufficient opportunities to communicate freely.

Finally, this paper manifests that team trust weakens the effect of cooperative CMS adopted by team leader on team psychological safety, which means that team leaders are likely to have a greater impact in adverse circumstance compared with favorable circumstance. Therefore, when facing adverse circumstance such as low team trust, team leaders should pay more attention to their behaviors and take appropriate actions to deal with problems efficiently, so as to maximize leadership effectiveness.

6. Limitations and Future Research Directions

Firstly, this paper just chooses two kinds of positive conflict management styles, including cooperative and competitive, without considering negative ones such as avoidant. It is valuable to further study the impact of negative CMS on TIP. Then, this paper investigates the intrinsic mechanism of team leader’s CMS on TIP and probes the mediating effect of TPS with team climate perspective based on social cognition theory and two-dimension theory. We can further examine other variables based upon the above idea in future studies. In addition, most studies demonstrate the positive moderating role of team trust. For example, Peñarroja [26] demonstrates that team trust plays a positive moderating role between team feedback and group information elaboration, and Kao [27] confirms that team trust improves the effect of transformational leadership on cohesion. However, this paper discovers that team trust plays a negative moderating role between team leader’s cooperative CMS and TPS. In the future, we can further distinguish what factors make team trust play a positive or negative moderating role. Finally, this study adopts an empirical test using cross-sectional data that cannot fully reveals the causality between variables. In the future, we can collect more longitudinal data to increase the reliability of research results.

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