**Fine to be on the Different Pages? Three-way Interaction Effects of Team Faultline, Team Value Diversity, and Team Task Design on Team Performance**

**ABSTRACT**

The successful management of diversity at work is currently the most important and challenging issue for managers in organizations. While scholars have deepened the understanding of the nature of diversity by proposing new concepts such as “team faultline,” previous studies on diversity focused more on the structural aspect of diversity, disregarding the role of the psychological aspect of diversity among team members. In addition, although team task design plays an important role in interactions among team members, the extent literature has not examined how it changes team processes under different structural and psychological team compositions. To overcome the above limitations, this study develops an integrative model of the effects of team faultlines, value diversity, and task design on team process and effectiveness. Drawing on the categorization-elaboration model, we suggest that team faultlines have a positive effect on team performance through team mental model only when both team value diversity and team task design are high. This paper intends to contribute to the literature of team diversity, team design, and team mental model.

**Keywords:**

Team diversity; Team faultline; Team value diversity; Team mental model; Categorization-elaboration model; Team design

The concept of faultlines, namely, “hypothetical dividing lines that may split a group into subgroups based on one or more attributes” (Lau & Murnighan, 1998, p. 328), has advanced the understanding of the implications of diversity at work by conceptualizing diversity as more complex bundles of demographic characteristics (Thatcher & Patel, 2011). The faultlines theory suggests that as team members form subgroups based on consistencies in demographic characteristics, they experience social categorization processes that hamper communication and coordination, resulting in lowered team effectiveness (Lau & Murnighan, 1998; Pearsall, Ellis, & Evans, 2008). Given the detrimental effect of faultlines, previous studies have investigated several boundary conditions that mitigate or even reverse their negative impacts (Bezrukova, Jehn, Zanutto, & Thatcher, 2009; Chung, Liao, & Jackson, 2015; Homan, van Knippenberg, van Kleef, & De Dreu, 2007; Ren, Gray, & Harrison, 2015; van Knippenberg, Dawson, West, & Homan, 2011).

The extant literature on faultlines, however, lacks specific discussions of the conditions under which faultlines are activated to result in a detrimental impact or to become an importance source for facilitating positive group functioning by utilizing a variety of talents from diverse backgrounds, knowledge, and expertise (Horwitz & Horwitz, 2007; Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Kozlowski & Bell, 2003; van Knippenberg & Mell, 2016). Similarly, although previous studies on faultlines have examined several process mechanisms underlying the association between team faultlines and effectiveness (Bezrukova et al., 2009; Homan et al., 2007; Jehn & Bezrukova, 2010), none has elaborated whether faultlines facilitate emergent states among team members. Considering that team emergent states are more proximal processes that lead to team effectiveness (Rapp, Maynard, Domingo, & Klock, 2021) and reflect whether a faultline has been activated (Jehn & Bezrukova, 2010), this is a substantial pitfall in the literature. Furthermore, although previous studies have examined various moderators of the effect of faultlines, they tended to examine the effect of macro-level environmental factors or that of team climate, neglecting the impact of team task design. Despite team task design being an important leveraging factor that changes the nature of interactions among team members (Stewart, 2006), existing research has rarely examined how it changes the impact of faultlines to predict team processes and corresponding outcomes.

To address the above limitations, we first examine the joint effect of team faultlines and team value diversity. Although Jehn and colleagues (1999) showed the independent, differential effects of demographic and value diversity, recent research on faultlines as well as diversity has rarely considered the role played by diversity in psychological characteristics such as value or affective states. Hence, we examine the joint effect of team faultlines and team value diversity in predicting team mental model. This paper specifically considers the team mental model, which is the shared perception among team members regarding the extent to which they have similar organized mental representations to understand, describe, and predict their team-relevant situation so they are “on the same page” (Cannon-Bowers, Salas, & Converse, 1993; Mohammed, Ferzandi, & Hamilton, 2010)—a crucial mediating mechanism that works as a team emergent state. Indeed, the team mental model accurately captures the “double-edged sword” nature of team diversity. For instance, while a team mental model is a substantial positive predictor of team effectiveness (Mohammed et al., 2010), Fisher and colleagues (2012) found that diversity negatively affects team mental model, showing the obvious challenge in managing teams. Hence, the team mental model is an ideal emergent state that determines whether diversity will contribute to synergy creation in teams or trigger a detrimental effect that would hamper team performance.

Drawing on the categorization­–elaboration model (CEM) (van Knippenberg, De Dreu, & Homan, 2004), we explain the above joint effects on team mental model. According to the CEM, the implications of diversity can vary depending on its corresponding processes; while faultlines can be detrimental when they facilitate social categorization processes, they can also be beneficial when they facilitate information elaboration processes that are activated when task informational and decision requirements are fulfilled (van Knippenberg et al., 2004). First, in applying the logic of social categorization, we posit that team faultlines and team value diversity have an interaction effect on team mental model; we argue that team faultlines negatively affect team mental model, thus hampering team performance. However, this happens only under the condition of high team value diversity, when team members actually perceive differences among their values and mindsets (Jehn et al., 1999; van Knippenberg et al., 2004). Second, building on the logic of information elaboration, we posit the additional moderating role of team task design, which enhances corresponding team performance, in team faultline/team value diversity–team mental model relationships (van Knippenberg et al., 2004). Figure 1 depicts the current research model.

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This paper intends to contribute to the literature on team faultlines, team design, and team mental model. First, we advance the literature on team faultlines by elaborating the independent and interactional effects of team faultlines, value diversity, and team task design. Second, our paper contributes to the literature on team design by examining the moderating role of team task design. While scholars have acknowledged that both compositional design and task design are important for establishing successful teamwork (Stewart, 2006), no investigation has examined their interactive nature. By examining how team task design changes the impact of team diversity (i.e., team faultline and team value diversity) on team process (i.e., team mental model), our paper enriches the understanding of team design. Third, our paper advances the literature on team mental model by revealing new antecedents of team mental model (Fisher et al., 2012).

**Literature Review and Hypotheses Development**

**Categorization–elaboration model**

van Knippenberg and colleagues (2004) proposed the CEM to articulate the nuanced implications of work group diversity for group effectiveness. According to the CEM, the impact of work group diversity is a function of social categorization and information elaboration processes. On the one hand, when individuals in a team recognize differences between themselves and others in the group, they are likely to form an “us versus them” mentality, which could result in interpersonal biases toward team members who are dissimilar to the focal individual (Brewer, 1979; van Knippenberg et al., 2004). Due to interpersonal biases, team members are likely to experience low interpersonal liking, group identification, and team cohesion and high relational conflict, which result in low team effectiveness (van Knippenberg et al., 2004; van Knippenberg & Schippers, 2007; Williams & O’Reilly, 1998). On the other hand, the CEM integrates the information elaboration perspective to explain why and how team diversity can facilitate positive work-relevant processes that lead to higher team effectiveness. The information elaboration perspective suggests that teams with a high level of diversity are more likely to have various distinct and unique types of information/perspectives, which work as resources for realizing higher performance and innovation by facilitating creative idea generation (De Dreu & West, 2001; Jehn et al., 1999).

Integrating these two perspectives, the CEM posits that the effect of team diversity on the information elaboration process can vary depending on the extent of the social categorization process and corresponding motivation/ability aspects of the team (van Knippenberg et al., 2004; van Knippenberg & Schippers, 2007). The effect of team diversity on information elaboration would be disruptive if a high level of interpersonal biases is present in a team due to social categorization processes, because such categorization processes induce team members to develop cognitive biases, resulting in the misunderstanding of others. These processes would reduce the motivation and ability of team members to collaborate to exploit their own full information/knowledge potential. In contrast, when social categorization processes and their corresponding interpersonal biases are not highly activated, team members’ motivation and ability to exploit their own information pool increase; accordingly, team diversity positively affects information elaboration and the corresponding team effectiveness. In support of the CEM, previous studies have discovered the interaction effect of diversity and social categorization in predicting team effectiveness (Homan et al., 2007; Spoelma & Ellis, 2017; Subasi, van Ginkel, & van Knippenberg, 2021).

The CEM assumes that all dimensions (i.e., social category and informational dimensions) of demographic diversity elicit social categorization and information elaboration processes. However, previous research has tended to focus more on the structural nature of diversity, such as demographic team composition, while neglecting the role of value diversity, which reflects the extent to which team members perceive each other as dissimilar in terms of psychological mindset (Jehn et al., 1999). In addition, as mentioned, the extant literature has not examined whether team task design facilitates the information elaboration process. Therefore, in this study, we apply the CEM to articulate how team faultlines, team value diversity, and team task design interact to predict the emergent team state.

**The role of team faultlines and team value diversity: Social categorization process**

According to the CEM, social categorization processes emerge when team members perceive a dissimilarity from other members (van Knippenberg et al., 2004; 2007). In this study, we propose two diversity-relevant factors that may cause social categorization processes: team faultlines and team value diversity. While team faultlines would work as a structural factor, team value diversity plays a role as a psychological factor (Jehn et al., 1999; Lau & Murnighan, 1998; Williams & O’Reilly, 1998). The team members of teams with higher levels of faultlines are more likely to form multiple subgroups that share similar demographic characteristics, since such differences are easily observed and recognized due to their visible nature (Lau & Murnighan, 1998). However, merely the existence of a structural team faultline does not guarantee the activation of the faultline; another trigger that facilitates the social categorization process is required (Jehn & Bezrukova, 2010). On the other hand, team value diversity would work as a trigger that activates the social categorization process in teams with high levels of faultlines. Team value diversity taps into the differences in psychological mindset among team members; thus, it becomes a crucial factor as team members work together for a long time (Harrison, Price, & Bell, 1998; Phillips & Loyd, 2006). As team members differ in mindsets and way of thinking, they could find it difficult to understand the other’s logical reasoning as well as emotional responses, which could lead to clashes resulting in conflict and a lowered sense of solidarity (Jehn et al., 1999).

In the face of difficulties in interaction due to high team value diversity, team members would try to find other team members who share similar values, opinions, and mindsets (Byrne, 1971). Considering this, team members in teams with a higher level of faultlines are more likely to seek coworkers with whom they share demographic characteristics, and interact with them exclusively, thus forming subgroups within the team (Lau & Murnighan, 1998). After forming subgroups in a team, team members focus more on communication with the focal subgroup members, while avoiding communication with the team members of different subgroups (Lau & Murnighan, 2005). Aside from the initial differences in value among team members, lowered interactions among different subgroups further aggravate cognitive biases toward different sub-group team members. Consequently, the members of different subgroups experience disruptions in interaction and communication processes and face difficulties in reaching consensus for mutual understanding, both of which result in destructive team processes (Brewer, 1979; Jehn et al., 1999).

Given that social categorization processes emerge owing to structural and psychological diversity, we expect such social categorization to negatively affect the team mental model. As the team mental model reflects the implicit coordination between team members and the activities they undertake to manage complex, dynamic, and uncertain contexts, it plays a crucial role in team processes (Cannon-Bowers et al., 1993; Mohammed et al., 2010). In applying the above logic of the CEM, we expect the interaction effect of team faultlines and team value diversity to predict the team mental model. As mentioned, high levels of both structural and psychological diversity (i.e., team faultline and value diversity, respectively) would cause problems in communication and interaction due to cognitive biases and affective adversity. This can negatively affect group processes (van Knippenberg et al., 2004). Additionally, as team members form subgroups and engage in exclusive communication among members of their own subgroup, they would presume that they are right while the other subgroups are wrong. Consequently, they would be less likely to recognize the need for communication with different subgroup members, which would lower interactions among all team members and thus hinder the emergence of a team mental model that is shared among team members. Based on the above, we posit the following:

*Hypothesis 1. Team faultlines and team value diversity have an interaction effect on the team mental model; team faultlines are negatively associated with team mental model when the team’s value diversity is high.*

**The role of team task design: Information elaboration process**

In the above, we have articulated that team faultlines activate a categorization process among team members that negatively affects the team mental model, especially when the team possesses a high level of team value diversity. We now further articulate a boundary condition that facilitates the information elaboration process among team members. In principle, the information elaboration process refers to discussion, exchange of ideas, and integration of information. Therefore, this process is likely to facilitate creative idea generation and innovation by exploiting the current resources in a team (van Kinppenberg et al., 2004). To benefit from the elaboration process in terms of performance, a team should possess a variety of members with different types of knowledge. As indicated, however, a high level of team diversity can be harmful owing to the emergence of categorization processes. Thus, although forming a high-diversity team is necessary, it is not sufficient for facilitating information elaboration processes. For this, managers need to establish a favorable team context that values active interactions among team members.

In this study, we specifically posit that team task design plays a crucial moderating role in facilitating the information elaboration process. Team task design refers to “a series of structures and roles within a team context that determine the allocation of tasks, responsibilities, and authority” (Hollenbeck, DeRue, & Guzzo, 2004). For a successful team design, practitioners not only consider structural composition, such as team diversity, but also establish an “enabling” task design that fits the team members’ characteristics and expertise (Wageman, Hackman, & Lehman, 2005). When managers assign appropriate roles and allow corresponding authority to each team member, team members understand the importance of their own tasks, perceive a high level of autonomy to decide work procedures and make judgments, and obtain the necessary information to undertake their own tasks (Hackman & Oldham, 1980; Wageman et al., 2005). When a motivational team task design is established, team members are able to put in high levels of effort toward tasks, resulting in higher team effectiveness (Stewart, 2006).

Given its nature, we expect that team task design would be a “sufficient condition” for information elaboration processes to emerge in teams. As the diversity of team composition increases, the team is able to possess more diverse sets of information, knowledge, and perspective. However, as teams with high levels of faultlines and team value diversity recognize that team members have different values and opinions, they are generally less inclined to share their own unique information, ideas, and opinions (van Knippenberg et al., 2004). Instead of raising conflict by voicing different opinions, they prefer to communicate with members of the same subgroup (Brewer, 1979; Lau & Murnighan, 2005). Specifically, when a team has a low level of task design, team members are generally unwilling to express and share their own ideas and information, because they worry that voicing different ideas or perspectives can hinder the consensus-making process (Stasser & Titus, 1985; 1987). Hence, instead of possibly causing conflict within the team, team members choose to withhold their information and ideas from members of other subgroups, thus failing to achieve a high-level team mental model. Consequently, when the team task design is low, diverse information is less likely to be shared, which hinders the emergence of the information elaboration process (van Kinppenberg et al., 2004).

However, when a team has a high level of team task design, team members need to put in their best efforts toward tasks. Therefore, they are more likely to share information and express their own perspectives, which facilitates information elaboration processes (van Kinppenberg et al., 2004). Since a team with high levels of task design should make decisions with a high level of authority and perform crucial, substantial tasks, all team members should engage in extensive communication with exchanges of opinions and information to reach a consensus. During communication, team members realize differences in opinion. Hence, to achieve a consensus among all the team members, coordination activities that involve assimilating and converging experiences are undertaken (Kolb & Kolb, 2009). Since these coordination processes correspond with the integration of different sets of information, they facilitate the information elaboration process (van Kinppenberg et al., 2004; Wageman et al., 2005), resulting in the emergence of a mental model among team members (Fisher et al., 2012; Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000). When team faultlines and team value diversity are high in teams with a high level of team task design, team members experience a less smooth process of task coordination. However, this disorderliness and conflict help shape the team's mental model by clarifying the perception that they have shared goals as a team and exchanged the various types of information needed for the task. Therefore, we can expect a positive relationship between team faultlines and team mental models when both the team value diversity and the level of team task design are high. Hence, we posit the following:

*Hypothesis 2. There is a three-way interaction between team faultlines, team value diversity, and team task design on team mental model.*

Finally, integrating the above hypotheses with the notion of team mental model (Fisher et al., 2012; Mathieu et al., 2000; Mohammed et al., 2010), we posit that the team mental model mediates the three-way interaction effect of team faultlines, team value diversity, and team task design in predicting team performance. As mentioned, the joint effect of team faultlines, team value diversity, and and team task design would affect the emergence of the team mental model. Given that team members share similar mental models, they are likely to develop efficient work processes, such as more back-up behaviors, implicit coordination, and enhanced communication (Mohammed et al., 2010). Owing to enhanced work processes among team members, a high-level team mental model would result in higher team performance (Mathieu et al., 2000). Hence, we posit the following:

*Hypothesis 3. Team mental model mediates the three-way interaction effect of team faultlines, team value diversity, and team task design on team performance.*

**Method**

We adopted a multi-source cross-sectional survey design to test the current research model. To estimate the appropriate sample size, we conducted a power analysis using G\*Power 3.1.9.7 (Faul, Erdfelder, Lang, & Buchmer, 2007). The results showed that for an estimated average effect size of 0.15, power of 90%, and alpha of 0.05, we needed a sample size of at least 130 teams to detect the effects of seven predictors (i.e., team faultlines; team value diversity; team task design; team faultlines\*team value diversity; team faultlines\*team task design; team value diversity\*team task design; team faultlines\*team value diversity\*team task design). Accordingly, we collected data from a manufacturing organization in the Republic of Korea. After obtaining approval from the organization’s HR department, we distributed the survey to 200 teams (2,000 employees and 200 team leaders). We distributed different versions of the survey packages, containing different questions, to employees and team leaders, with the intent of reducing concerns related to common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In total, 184 leaders and 1,677 employees returned their questionnaires (response rate = 84.6%). All the participants were full-time employees who worked in the organization more than 40 hours a week. Most of participants were male (99.9%), their mean age was 39.0 years (*s. d.* = 9.5), and their mean tenure was 12.4 years (*s. d.* = 7.3).

The participants were required to respond to questions about their team. Most of the questions were answered on a Likert-type scale ranging from “Strongly disagree” (1) to “Strongly Agree” (7). Questions about demographic information (i.e., age, gender, tenure, and education) were exceptions. All items were written in Korean, so we used the back-translation method to ensure that the items accurately captured their original English meaning and were understood in Korean (Brislin, 1970). Three doctoral degree holders in management (including a bilingual professor), four middle-level managers, and two HR managers reviewed the items to ensure that the phrasing was clear.

**Measurements**

**Team faultline.** Team members were asked to self-report their demographic and functional variables, such as age, gender, organizational tenure, and functional background (Bezrukova et al., 2009). Among those variables, we excluded gender in the calculation of faultlines, since most of the participants were male. We calculated team faultline scores by multiplying

faultline strength and distance, as this method fully models faultline effect and it has shown good validity in previous research (Bezrukova et al., 2009; 2016).

**Team value diversity.** We asked team members to rate a 4-item measure from Jehn et al. (1999). A sample item includes “members had similar goals (reverse coded)” (α = .91). Given the reliability at the individual level, we further examined the level of agreement and reliability to check whether it would be appropriate to aggregate individual responses at the team level. The results showed appropriate levels of RWGj = .92 and intraclass correlation coefficient (ICC(1) = .13 and ICC(2) = .59; F = 2.49, *p* = .000), supporting the aggregation of team members’ scores (Bliese, 2000; James, Demaree, & Wolf, 1984; Klein & Kozlowski, 2000).

**Team task design.** We adopted a 3-item measure from Wageman and colleagues (2005) to measure team task design. Sample items include “We perform a whole, identifiable piece of work” and “The work we do requires the team to make many ‘judgment calls’ as we carry out tasks” (α = .70). Our inter-rater reliability tests also indicated an appropriate level of values (RWGj = .91; ICC(1) = .19, ICC(2) = .62; *F* = 2.65, *p* < .01).

**Team mental model.** Team members were asked to rate a 9-item scale of team mental model adopted from Johnson, Lee, Lee, O'Connor, Khalil, and Huang (2007). Sample items are “My team has a shared goal for various project tasks” and “My team understands how they can exchange information for doing various team tasks” (α = .97). The inter-rater reliability indicators showed satisfactory values (RWGj = .97; ICC(1) = .17, ICC(2) = .60; *F* = 2.48, *p* < .01).

**Team performance.** We asked team leaders to rate the performance of their own teams using the 5-item scale devised by Henderson and Lee (1992). Sample items include “Our team’s ability meets the goal of the project” and “Our team produces a high quality of work” (α = .91).

**Results**

Table 1 shows the descriptive statistics and bivariate correlations among variables. Supporting our expectation, there was a non-significant correlation between team faultline and team value diversity (*r* = .01, *n. s.*). However, none of the study variables were significantly associated with team faultline; this implies rather nuanced implications of team faultline. Team value diversity was negatively related to the team mental model (*r* = -.38, *p* < .01) and team performance was positively related to it (*r* = .24, *p* < .05). These results provide preliminary support for our predictions.

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Table 2 presents the results of the hierarchical regression analysis. Model 4 of Table 2 indicates the interactive effect of team faultlines and team value diversity on team mental model. The result showed a non-significant interaction effect of team faultlines and value diversity on team mental model (*β* = 0.09, *n.s.*). Hence, Hypothesis 1 is not supported. However, as shown in Model 5 of Table 2, a significant three-way interaction effect of team faultlines, team value diversity, and team task design on team mental model (β = 0.17, *p* < .05) was found. Figure 2 depicts the nature of the three-way interaction effect; while the effect of team faultlines on team mental model was positive when both team value diversity and team task design were high (*b* = .12, *SE* = .03, *p* < .01), the association was not significant under other conditions. Hence, Hypothesis 2 is supported.

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Finally, Hypothesis 3 suggested a mediating role of team mental model in the three-way interaction effect of team faultlines, team value diversity, and team task design on team performance. To test the indirect effect of the moderated mediation hypothesis (10,000 bootstrapped samples), we adopted Hayes’ (2012) PROCESS macro for SPSS (model 11). Table 3 suggests the indirect effect of the three-way interaction on team performance through team mental model. The indirect effect was positively significant only when both team value diversity and team task design were high (0.03, *SE* = 0.01, 95% CI [0.01, 0.07]). Hence, Hypothesis 3 is supported.

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**Discussion**

In this study, we examined the interactive effect of team faultlines, team value diversity, and team task design on team performance through team mental model. In line with our expectations, the results showed that team faultlines had a significant effect on team performance through team mental model when both the team value diversity and task design were high. Contrary to our hypothesis, no significant two-way interactions between team faultlines and value diversity were observed while predicting the team mental model. To interpret the current findings, we suspect that team faultlines may not necessarily be harmful in establishing the team mental model, especially when two subgroups are clearly defined. Although a meta-analytic finding suggested a negative association between team faultlines and team processes/outcomes by Thatcher and Patel (2011), Gibson and Vermeulen (2003) showed that subgroups can facilitate team learning processes, suggesting some positive implications of team faultlines. Accordingly, we can speculate that the current data included some teams that showed a “healthy divide,” which can facilitate sound interactions among subgroups. Therefore, an insignificant relationship was found between team faultlines and the team mental model.

**Theoretical and practical implications**

This paper intends to advance the current literature in the following ways. First, we extend the literature on diversity by examining the interactive effect of team faultlines and team value diversity, thus capturing some highly comprehensive implications of team diversity. While research on team faultlines advances diversity literature by capturing the nuanced structural nature of teams, the existing studies on diversity have neglected the role of the deeper, psychological aspect of diversity (cf. Jehn et al., 1999). In this paper, we posited and found the three-way interactive effect of team faultlines, team value diversity, and team task design on team mental model, thus confirming that scholars need to elaborate both the structural and psychological aspects of diversity. We encourage future research to examine comprehensive aspects of team diversity rather than exclusively focusing on a limited aspect.

Second, this article advances literature on team design by articulating the moderating effect of team task design on the relationship between team diversity and team mental model. Although substantial investigations have been conducted on team task design as an important antecedent of team processes and functioning (Stewart, 2006), scholars have not acknowledged that it can work as an important boundary condition that changes structural and psychological inputs in team processes. The current paper shows that a high-level team task design is sufficient for exploiting the beneficial aspects of team diversity. Building on our findings, scholars could further investigate how changes in team design alter the association between team inputs and processes, going beyond the topics of team diversity and team mental model.

Third, by examining new antecedents of team mental model (i.e., team faultlines and team value diversity), this paper enriches the understanding of team mental model. Given that the extant literature pays more attention to examining the impact of team mental model and articulating boundary conditions that change the impact of team mental model, research examining the antecedents of team mental model is relatively scarce (cf. Fisher et al., 2012). In addition, previous studies tended to examine the main effect of antecedents rather than the interactive effect of multiple antecedents. In this study, by examining the three-way interaction between team faultlines, value diversity, and task design in predicting team mental model, we showed that the development of the team mental model is more complicated than a simple aggregation of certain antecedents.

Aside from the above theoretical contributions, we aimed to provide managerial implications for practitioners. Specifically, our study produced significant findings regarding diversity management and team task design. In terms of the management of team composition, managers tend to focus more on the management of demographic factors; alternatively, managers often consider team composition “a given condition,” so the management of diversity is disregarded. According to results of this study, however, managers should focus more on the psychological aspect of value diversity to enable the recognition of a more comprehensive diversity of values and minds. As mentioned above, if managers do not recognize differences in team members, they may not utilize such differences in creating synergy in teams. On the other hand, substantial value diversity despite similarities in demographic characteristics may imply the existence of substantial conflict among team members. To overcome such challenges, managers need to implement additional interventions to create common ground among team members.

Our findings also suggest that simply composing a diverse group is insufficient for exploiting the full potential of team members; establishing a high-level team task design enables the emergence of a team mental model and thus facilitates team performance. Accordingly, this study indicates the importance of team task design in diversity management. In reality, however, the nature of a job, such as exclusive engagement in routinized and repetitive tasks, may not allow team leaders to establish a high-level team task design. Our results suggest that under such circumstances, leaders should make efforts to minimize value diversity among team members, such as by proposing and constructing a superordinate goal and identity at work (Brewer, 2000; Eggins, Haslam, & Reynolds, 2002; Kane, 2010).

**Limitations and future research**

Our study has a few limitations. First, although we collected data from multiple sources to avoid common method bias, the current cross-sectional research design does not allow us to draw causal conclusion on the relationship among variables. Specifically, it is plausible that increased team mental model would facilitate attraction, selection, and attrition processes, thus forming a homogeneous team composition (Schneider, 1987). In the results of the current study, which showed substantial variance in demographic characteristics and value diversity, the plausibility of reverse causal relationship is slightly weak. In addition, since we posited and found the interactive effect of team diversity-relevant variables and team task design on the team mental model, concerns regarding reverse causality are less likely to be a crucial concern threatening the validity of the current study. However, it may be beneficial to adopt an advanced research design in future studies, such as longitudinal data collection or a quasi-experimental design, to confirm the above relationship.

Second, in operationalizing team faultlines, we did not consider the differential impact of diverse types of team faultlines. For instance, the impact of a social category faultline can differ from that of an informational faultline (Bezrukova et al., 2009). In the current study, however, the participants tended to have homogeneous characteristics in terms of social category, such as gender and ethnicity. Given that age is the only substantial indicator for measuring the social category faultline, we considered the impact of overall team faultlines rather than dividing two varying impacts of social category and informational faultlines. We encourage scholars to conduct further studies to examine whether social category and informational faultlines have independent and differential impacts in predicting team mental model. For example, collecting data from ethnically-diverse countries and mixed-gender workplaces could be beneficial not only for testing cross-cultural differences, but also for investigating the complicated nature of team faultlines more comprehensively.

Third, although the current study examined only one moderator (i.e., team task design), it is possible that more diverse factors would work as boundary conditions that change the impact of team diversity on team mental model. Specifically, leadership influences or firm-level contextual factors, such as organizational climate and culture, are likely to change the effect of team diversity from negative to positive, or vice versa. Similarly, in articulating mechanisms that mediate the relation between team diversity and performance, more diverse mechanisms that go beyond team mental model are likely to exist. For example, a diverse team composition could cause the emergence of negative psychological or behavioral processes (e.g., team incivility, dysfunctional team behavior), which do not necessarily exist in teams with a low mental model. We recommend future research to examine both positive and negative mechanisms within team processes.

To conclude, this study developed an integrative model of team value diversity and task design in predicting team process and corresponding team performance by drawing on the CEM. Therefore, it revealed nuanced implications of team diversity. Accordingly, we intend to advance the literature on teams, especially research on diversity, team task design, and team mental models. Building on the current findings, we hope that future studies will consider more comprehensive aspects of diversity among team members and elaborate on more boundary conditions and diverse team processes.

**References**

Bezrukova, K., Jehn, K. A., Zanutto, E. L., & Thatcher, S. M. (2009). Do workgroup faultlines help or hurt? A moderated model of faultlines, team identification, and group performance. *Organization Science*, *20*(1), 35-50.

Bezrukova, K., Spell, C. S., Caldwell, D., & Burger, J. M. (2016). A multilevel perspective on faultlines: Differentiating the effects between group-and organizational-level faultlines. *Journal of Applied Psychology*, *101*(1), 86-107.

Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein & S. W. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations* (pp. 349 –381). San Francisco: Jossey-Bass.

Brewer, M. B. (1979). In-group bias in the minimal intergroup situation: A cognitive-motivational analysis. *Psychological Bulletin*, *86*(2), 307-324.

Brewer, M. B. (2000). Superordinate goals versus superordinate identity as bases of intergroup cooperation. In D. Capozza & R. Brown (Eds.), *Social identity processes: Trends in theory and research* (pp. 117-132). Thousand Oaks, CA: Sage.

Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-cultural Psychology*, *1*(3), 185-216.

Byrne, D. (1971). *The Attraction Paradigm*, New York: Academic Press.

Cannon-Bowers, J. A., Salas, E., & Converse, S. (1993). Shared mental models in expert decision making. In: Castellan NJJ (ed.) *Individual and Group Decision Making: Current Issues* (pp.221-246). Hillsdales, NJ: Lawrence Erlbaum Associates.

Chung, Y., Liao, H., Jackson, S. E., Subramony, M., Colakoglu, S., & Jiang, Y. (2015). Cracking but not breaking: Joint effects of faultline strength and diversity climate on loyal behavior. *Academy of Management Journal*, *58*(5), 1495-1515.

De Dreu, C. K., & West, M. A. (2001). Minority dissent and team innovation: The importance of participation in decision making. *Journal of Applied Psychology*, *86*(6), 1191-1201.

Eggins, R. A., Haslam, S. A., & Reynolds, K. J. (2002). Social identity and negotiation: Subgroup representation and superordinate consensus. *Personality and Social Psychology Bulletin*, *28*(7), 887-899.

Fisher, D. M., Bell, S. T., Dierdorff, E. C., & Belohlav, J. A. (2012). Facet personality and surface-level diversity as team mental model antecedents: implications for implicit coordination. *Journal of Applied Psychology*, *97*(4), 825-841.

Gibson, C., & Vermeulen, F. (2003). A healthy divide: Subgroups as a stimulus for team learning behavior. *Administrative Science Quarterly*, *48*(2), 202-239.

Hackman, J. R., & Oldham, G. R. (1980). *Work redesign*, Reading, Mass: Addison-Wesley.

Harrison, D. A., Price, K. H., & Bell, M. P. (1998). Beyond relational demography: Time and the effects of surface-and deep-level diversity on work group cohesion. *Academy of Management Journal*, *41*(1), 96-107.

Hayes, A. F. (2012). *PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling* [White paper]. Retrieved from [www.afhayes.com/public/process2012.pdf](http://www.afhayes.com/public/process2012.pdf)

Henderson, J. C., & Lee, S. (1992). Managing I/S design teams: A control theories perspective. *Management Science*, *38*(6), 757-777.

Hollenbeck, J. R., DeRue, D. S., & Guzzo, R. (2004). Bridging the gap between I/O research and HR practice: Improving team composition, team training, and team task design. *Human Resource Management*, *43*, 353–366.

Homan, A. C., van Knippenberg, D., van Kleef, G. A., & De Dreu, C. K. (2007). Bridging faultlines by valuing diversity: diversity beliefs, information elaboration, and performance in diverse work groups. *Journal of Applied Psychology*, *92*(5), 1189-1199.

Horwitz, S. K., & Horwitz, I. B. (2007). The effects of team diversity on team outcomes: A meta-analytic review of team demography. *Journal of Management*, *33*(6), 987-1015.

Ilgen, D. R., Hollenbeck, J. R., Johnson, M., & Jundt, D. (2005). Teams in organizations: From input-process-output models to IMOI models. *Annual Review of Psychology*, *56*, 517-543.

James, L. R., Demaree, R. G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. *Journal of Applied Psychology*, *69*(1), 85-98.

Jehn, K. A., & Bezrukova, K. (2010). The faultline activation process and the effects of activated faultlines on coalition formation, conflict, and group outcomes. *Organizational Behavior and Human Decision Processes*, *112*(1), 24-42.

Jehn, K. A., Northcraft, G. B., & Neale, M. A. (1999). Why differences make a difference: A field study of diversity, conflict and performance in workgroups. *Administrative Science Quarterly*, *44*(4), 741-763.

Johnson, T. E., Lee, Y., Lee, M., O'Connor, D. L., Khalil, M. K., & Huang, X. (2007). Measuring sharedness of team-related knowledge: Design and validation of a shared mental model instrument. *Human Resource Development International*, *10*(4), 437-454.

Kane, A. A. (2010). Unlocking knowledge transfer potential: Knowledge demonstrability and superordinate social identity. *Organization Science*, *21*(3), 643-660.

Klein, K. J., & Kozlowski, S. W. J. (2000). *Multilevel theory, research, and methods in organizations: Foundation, extensions, and new direction*. San Francisco: Jossey-Bass.

Kolb, A., & Kolb, D. (2009). Experiential learning theory: A dynamic, holistic approach to management learning, education and development. In S. Armstrong & C. Fukami (Eds.), *The SAGE handbook of management learning, education and development* (pp. 42–68). Thousand Oaks, CA: Sage.

Kozlowski, S. W. J., & Bell, B. S. (2003). Work groups and teams in organizations. In W. C. Borman & D. R. Ilgen (Eds.), *Handbook of psychology: Industrial and organizational psychology* (Vol. 12, pp. 333–375). New York: Wiley.

Lau, D. C., & Murnighan, J. K. (1998). Demographic diversity and faultlines: The compositional dynamics of organizational groups. *Academy of Management Review*, *23*(2), 325-340.

Lau, D. C., & Murnighan, J. K. (2005). Interactions within groups and subgroups: The effects of demographic faultlines. *Academy of Management Journal*, *48*(4), 645-659.

Mathieu, J. E., Heffner, T. S., Goodwin, G. F., Salas, E., & Cannon-Bowers, J. A. (2000). The influence of shared mental models on team process and performance. *Journal of Applied Psychology*, *85*(2), 273-283.

Mohammed, S., Ferzandi, L., & Hamilton, K. (2010). Metaphor no more: A 15-year review of the team mental model construct. *Journal of Management*, *36*(4), 876-910.

Pearsall, M. J., Ellis, A. P. J., & Evans, J. M. (2008). Unlocking the effects of gender faultlines on team creativity: Is activation the key? *Journal of Applied Psychology, 93*(1), 225–234.

Phillips, K. W., & Loyd, D. L. (2006). When surface and deep-level diversity collide: The effects on dissenting group members. *Organizational Behavior and Human Decision Processes*, *99*(2), 143-160.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879-903.

Rapp, T., Maynard, T., Domingo, M., & Klock, E. (2021). Team emergent states: What has emerged in the literature over 20 years. *Small Group Research*, *52*(1), 68-102.

Ren, H., Gray, B., & Harrison, D. A. (2015). Triggering faultline effects in teams: The importance of bridging friendship ties and breaching animosity ties. *Organization Science*, *26*(2), 390-404.

Schneider, B. (1987). The people make the place. *Personnel Psychology*, *40*(3), 437-453.

Spoelma, T. M., & Ellis, A. P. (2017). Fuse or fracture? Threat as a moderator of the effects of diversity faultlines in teams. *Journal of Applied Psychology*, *102*(9), 1344-1359.

Stasser, G., & Titus, W. (1985). Pooling of unshared information in group decision making: Biased information sampling during discussion. *Journal of Personality and Social Psychology*, *48*(6), 1467-1478.

Stasser, G., & Titus, W. (1987). Effects of information load and percentage of shared information on the dissemination of unshared information during group discussion. *Journal of Personality and Social Psychology*, *53*(1), 81-93.

Stewart, G. L. (2006). A meta-analytic review of relationships between team design features and team performance. *Journal of Management*, *32*(1), 29-55.

Subasi, B., van Ginkel, W. P., & van Knippenberg, D. (2021). Minority status, access to information, and individual performance. *Journal of Applied Social Psychology*, *51*(3), 159-175.

Thatcher, S., & Patel, P. C. (2011). Demographic faultlines: A meta-analysis of the literature. *Journal of Applied Psychology*, *96*(6), 1119-1139.

van Knippenberg, D., Dawson, J. F., West, M. A., & Homan, A. C. (2011). Diversity faultlines, shared objectives, and top management team performance. *Human Relations*, *64*(3), 307-336.

van Knippenberg, D., De Dreu, C. K., & Homan, A. C. (2004). Work group diversity and group performance: an integrative model and research agenda. *Journal of Applied Psychology*, *89*(6), 1008-1022.

van Knippenberg, D., & Mell, J. N. (2016). Past, present, and potential future of team diversity research: From compositional diversity to emergent diversity. *Organizational Behavior and Human Decision Processes*, *136*, 135-145.

van Knippenberg, D., & Schippers, M. C. (2007). Work group diversity. *Annual Review of Psychology*, *58*, 515–541.

Wageman, R., Hackman, J. R., & Lehman, E. (2005). Team diagnostic survey: Development of an instrument. *Journal of Applied Behavioral Science*, *41*(4), 373-398.

Williams, K. Y., & O’Reilly, C. A. (1998). Demography and diversity in organizations: A review of 40 years of research. *Research in Organizational Behavior*, *20*, 77–140.

**TABLE 1**

**Correlations among study variables**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Mean | Standard Deviation | 1 | 2 | 3 | 4 | 5 |
| 1 | Team Faultline | 11.94 | 7.42 | ( - ) |  |  |  |  |
| 2 | Team Value Diversity | 3.27 | 0.80 | .01 | (.91) |  |  |  |
| 3 | Team Task Design | 4.47 | 0.50 | .02 | -.51\*\* | (.70) |  |  |
| 4 | Team Mental Model | 4.49 | 0.73 | .10 | -.38\*\* | .33\*\* | (.97) |  |
| 5 | Team Performance | 5.46 | 0.75 | -.01 | -.28\*\* | .25\* | .24\* | (.91) |

*Note*. *N* = 184 teams. \**p* < .05, \*\**p* < .01 (two-tailed).

**TABLE 2**

**Hierarchical regression results**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Team Mental Model | | | | |
| Variable | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| Main Effects |  |  |  |  |  |
| Team Faultline (FL) | .10 | .10 | .11 | .11 | .17\* |
| Team Value Diversity (TVD) | -.38\*\* | -.29\*\* | -.31\*\* | -.31\*\* | -.29\*\* |
| Team Task Desgin (TTD) |  | .17\* | .15† | .15† | .15† |
| Two-way Interactions |  |  |  |  |  |
| FL × TTD |  |  | .07 | .11 | .15† |
| TVD × TTD |  |  | -.05 | -.04 | -.05 |
| FL × TVD |  |  |  | .09 | .18\* |
| Three-way Interaction |  |  |  |  |  |
| FL × TVD × TTD |  |  |  |  | .17\* |
| R2 | .16 | .18 | .18 | .19 | .21 |

*Note*. *N* = 184 teams. †*p* < .10, \**p* < .05, \*\**p* < .01 (two-tailed).

**TABLE 3**

**Indirect effect of three-way interaction on team performance via team mental model**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Level of Team Value Diversity** | **Level of Team Task Design** | **Coefficient** | **Standard Error** | **95% Lower CI** | **95% Upper CI** |
| Low | Low | -.01 | .01 | -.03 | .02 |
| Low | High | .01 | .01 | -.01 | .01 |
| High | Low | -.01 | .01 | -.02 | .01 |
| High | High | .03 | .01 | .01 | .07 |

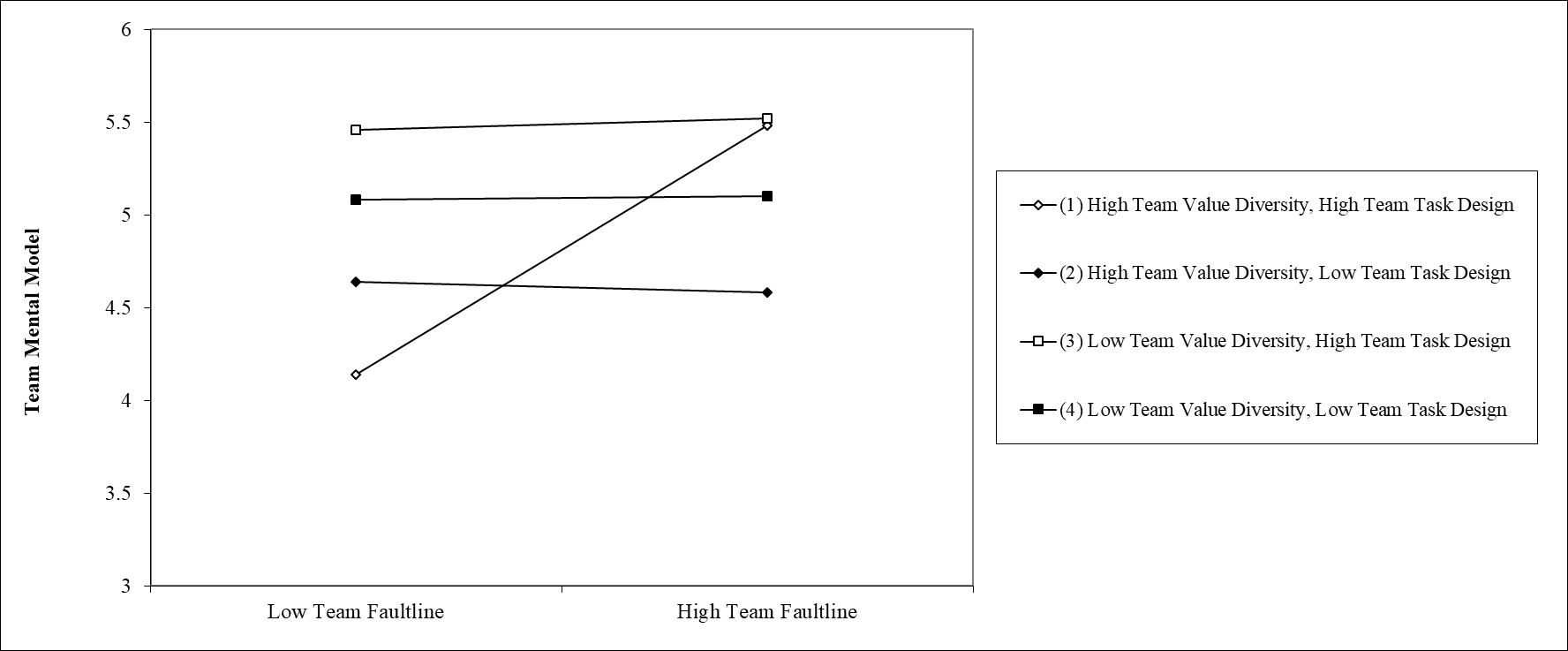
**FIGURE 1**

**Research Model**

|  |
| --- |
|  |

**FIGURE 2**

**Three-way interaction effect of team fautline, team value dieversity, and team task design on team mental model**

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