The Impact of Team Cultural Diversity on Team Innovation and Its Mechanisms

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Date: 2019-07-05T00:00:00+00:00

Abstract

With the rapid development of economic globalization and multinational enterprises, teams with diverse cultural backgrounds have increasingly emerged within organizations. Enterprise managers expect that employees with different cultural backgrounds can contribute novel viewpoints and perspectives through teamwork, thereby fostering team innovation. Consequently, exploring the influence relationship between team cultural diversity and team innovation has become a focal issue of joint concern for both academia and industry in recent years. Therefore, adopting the theoretical perspective of social categorization-information processing, this study first clarifies the theoretical framework of team cultural diversity, and further examines the influence relationship and underlying mechanisms between team cultural diversity and team innovation; moreover, it explores the boundary conditions of this relationship from both intra-team and extra-team factors respectively. In practice, the research conclusions will also provide certain theoretical guidance for enterprises to effectively manage cross-cultural teams and promote corporate innovation.

Full Text

The Impact of Team Cultural Diversity on Team Innovation: Mechanisms and Boundary Conditions

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Abstract: With accelerating economic globalization and the rapid expansion of multinational corporations, culturally diverse teams have become increasingly common in modern organizations. Managers anticipate that employees from

different cultural backgrounds will contribute novel perspectives and insights that enhance team innovation. Consequently, examining the relationship between team cultural diversity and innovation has emerged as a critical focus for both academics and practitioners. Adopting a social categorization-information processing theoretical lens, this study first clarifies the theoretical framework of team cultural diversity and then investigates its impact on team innovation along with the underlying mechanisms. Furthermore, we explore boundary conditions from both internal team factors and external environmental perspectives. Our findings will provide theoretical guidance for effectively managing cross-cultural teams and fostering organizational innovation.

Keywords: team cultural diversity; team innovation; diversity belief; collective regulatory focus; team innovation feedback

1. Problem Statement

Economic globalization and the swift growth of multinational enterprises have prompted increasing numbers of firms to adopt cross-cultural team strategies, expecting employees from diverse cultural backgrounds to contribute fresh experiences, perspectives, and viewpoints that drive organizational innovation and development. Facebook, the world' s largest social media company, places significant emphasis on team cultural diversity, treating team diversification as one of its most important strategic objectives. Since 2013, Facebook has established a Global Head of Diversity position within its executive team and has published annual diversity reports since 2014 to demonstrate progress in team diversification. As Maxine Williams, Facebook' s Global Head of Diversity, stated: "Diversity is critical to Facebook. We build products to connect the world, which means we need a team that understands and can bring different backgrounds, perspectives, experiences, and cultures." By June 2016, approximately half of Facebook' s employees came from other countries, with 38% of U.S. headquarters staff being Asian, 4% Hispanic, and 2% African. In technical departments, the proportion of Asian employees reached as high as 46%.

With the implementation of the "Belt and Road" and "Chinese Enterprises Going Global" strategies, Chinese companies are increasingly facing challenges in managing cross-cultural teams. As a global leader in communications technology, Huawei has actively promoted workforce diversification in its R&D teams. By employing cross-cultural collaboration across global R&D centers, Huawei has achieved its global asynchronous R&D strategy. Currently, Huawei' s multicultural family comprises 170,000 employees from 163 countries and regions worldwide. By 2015, Huawei had hired over 34,000 employees overseas, with a localization rate of 72% for overseas staff and 17.7% for middle and senior management. Additionally, companies such as Alibaba, SF Express, and Sany Heavy Industry also emphasize employee diversity. In 2015, Alibaba appointed its first foreign executive, Michael Evans, to lead global recruitment and market

operations, while SF Express has vigorously promoted the recruitment of foreign employees at its Shenzhen headquarters to build a talent pool for overseas management. According to the *China International Migration Report (2015)*, as China' s international image and economic strength continue to improve, pursuing the "Chinese Dream" has become a new trend in international migration. China ranks third globally, after Switzerland and Singapore, as the most attractive destination for expatriates. As more Chinese companies expand internationally and the number of foreign workers and students in China increases dramatically, team cultural diversity will become a new management challenge for Chinese enterprises.

In academia, team cultural diversity has also become a focal point of recent research, particularly regarding its relationship with team innovation. In today' s era of intensifying market competition, innovation has become essential for maintaining competitive advantage. One primary motivation for adopting cross-cultural teams is the expectation that employees from different cultural backgrounds will provide diverse information, perspectives, and viewpoints, thereby expanding the breadth, depth, and integration of team-level knowledge and ultimately promoting innovation. However, existing research has yet to reach consistent conclusions regarding the relationship between team cultural diversity and innovation (Stahl, Maznevski, Voigt, & Jonsen, 2010). Some scholars have found a positive relationship (Earley & Mosakowski, 2000; Niebuhr, 2010), while others have identified negative or non-significant effects (Bell, Villado, Lukasik, Belau, & Briggs, 2011; Harvey, 2013; Ostergaard, Timmermans, & Kristinsson, 2011).

Given these inconsistent findings, we identify several critical questions warranting deeper investigation: First, what are the primary reasons for these inconsistent conclusions? Second, does team cultural diversity affect team innovation, and if so, what are the underlying mechanisms? Third, what internal and external boundary conditions moderate the relationship between team cultural diversity and team innovation? To address these questions, we propose four research modules. In Module 1, we identify the causes of inconsistent findings by reviewing existing literature, revealing that the primary issue lies in the unclear theoretical framework and measurement methods for team cultural diversity. Consequently, we propose a two-dimensional theoretical framework comprising surface-level and deep-level cultural diversity and develop a corresponding measurement scale. Module 2 examines the impact of team cultural diversity on team innovation and its internal mechanisms from a social categorization-information processing perspective. Module 3 explores internal boundary conditions, while Module 4 investigates external boundary conditions affecting this relationship.

2.1 Related Research on Team Cultural Diversity

Team cultural diversity refers to the phenomenon where team members come from different cultural backgrounds (Cox, 1994). Previous research has typically classified cross-cultural teams into three types (Chen, 2013): token groups (with only 1-2 members from other cultures while the majority share the same culture), bicultural groups (with members from two cultures in roughly equal numbers), and multicultural groups (with members from three or more cultures). Token groups have been shown to isolate and marginalize minority members, limiting their impact on team cultural diversity. Bicultural groups tend to form two subcultural teams, leading to subgroup problems. Given these special cases and the prevalence of multicultural groups in management practice, this study focuses specifically on multicultural groups, applying this criterion throughout data collection and processing.

Although research on team cultural diversity has attracted considerable attention, it remains relatively limited. Existing studies have primarily examined the effects of team cultural diversity on team and individual innovation, cohesion, information exchange and integration, and performance.

Innovation: Research on team cultural diversity and innovation has yielded inconsistent conclusions (Jackson, Joshi, & Erhardt, 2003; van Knippenberg, De Dreu, & Homan, 2004; Williams & O' Reilly, 1998). On one hand, some studies find that cultural diversity promotes knowledge sharing and exchange, thereby enhancing innovation (Leung & Chiu, 2010). According to motivated information processing theory, exposure to different cultures and information stimulates individuals to generate new ideas and integrate diverse perspectives (Perry-Smith & Shalley, 2003). Multicultural teams thus provide access to broader knowledge and information compared to culturally homogeneous teams. Chua (2018) demonstrated that in culturally diverse teams, employees gain new culture-related knowledge and information through social connections with colleagues from different backgrounds, facilitating knowledge sharing and promoting team innovation. On the other hand, some scholars argue that cultural diversity may inhibit innovation. Based on similarity-attraction theory, individuals hold positive attitudes toward similar others ("us") and negative evaluations toward dissimilar others ("them") (Billig & Tajfel, 1973). Cultural differences can lead to negative evaluations, emotional conflicts, and relationship tensions that damage team climate and reduce willingness to engage in innovation-related activities, including sharing experiences and exchanging information.

Cohesion: Chung et al. (2015) found in a study of 1,652 employees across 76 teams that gender diversity negatively affected loyalty behaviors, while diversity climate positively influenced them. They also found that a supportive diversity climate weakened the negative relationship between gender diversity and loyalty. Leslie (2017) emphasized the importance of examining the degree of cultural diversity, suggesting that when teams comprise two substantially different subcultural groups, cultural diversity affects team cohesion and subsequently

team performance. van Knippenberg et al. (2004) proposed the categorization-elaboration model (CEM) to examine the relationship between team cultural diversity and performance, noting that diversity triggers negative emotional reactions, including relationship conflict, lower cohesion, reduced identity, and diminished commitment.

Information Exchange and Integration: Nouri et al. (2013) found that individuals in culturally diverse relationships communicated less frequently and effectively than those in culturally homogeneous relationships. Winkler and Bouncken (2011) discovered in a longitudinal study that cultural differences in communication styles negatively affected knowledge-sharing willingness in multicultural teams. Kearney, Gebert, and Voelpel (2009) found that low team identity was associated with low project information integration in culturally diverse R&D teams. van Dick, van Knippenberg, Hägele, Guillaume, and Brodbeck (2008) similarly found that low team identity led to reduced information integration in culturally diverse teams. Earley and Mosakowski (2000) found that national diversity hindered effective team communication.

Performance: Nederveen Pieterse, van Knippenberg, and van Dierendonck (2013) examined the relationship between cultural diversity and team performance, finding that information integration mediated this relationship and that team member goal orientation moderated it. Specifically, when team members had high learning orientation and low performance orientation, cultural diversity had a stronger positive effect on team performance. Tröster, Mehra, and van Knippenberg (2014) conducted a longitudinal study across 91 teams in 60 countries, finding that the interaction between team network structure and cultural diversity significantly affected team effectiveness and performance. Higher cultural diversity strengthened the positive effects of task network density on team effectiveness and network centralization on team performance.

2.2 Related Research on Team Innovation

Team innovation refers to novel and useful ideas generated collectively by a group of employees regarding products, services, work processes, and procedures (Shin & Zhou, 2007). In teams, individuals are more likely to learn different knowledge, skills, thinking styles, and problem perspectives from other members, integrating these into their own knowledge base and thereby enhancing individual creativity (Lipman-Blumen & Leavitt, 1999).

Numerous studies have examined team-level antecedents of team innovation. For instance, Chirumbolo, Mannetti, Pierro, Areni, and Kruglanski (2005) found in a laboratory study that high need for closure among team members reduced team innovation capacity. Gilson and Shally (2004) used cluster analysis to identify that goal sharing, participative decision-making, supportive climate, member socialization, and average team tenure positively influenced team innovation. Gino, Argote, Miron-Spektor, and Todorova (2010) found that direct

task experience (but not indirect experience) positively affected team innovation. In the Chinese context, Liu and Liu (2013) empirically examined the effects of procedural justice, transactional leadership, and team efficacy on team innovation performance from fairness and leadership perspectives. Liu and Liu (2012) investigated the influence mechanisms of team emotional climate, emotional labor, and team efficacy on team innovation performance using paired data from 85 team leaders and 475 members. Sui, Chen, and Wang (2012) explored the effects of innovative climate, creative efficacy, and team leadership on team innovation performance. Jiang, Gu, Wang, and Jin (2011) examined the relationships among R&D team human capital, social capital, and team innovation with learning from errors as a mediator. Yuan, Zhang, Wang, and Huang (2015) investigated the impact of R&D team boundary-spanning activities on team innovation performance, identifying team reflexivity as a mediator and empowering leadership as a moderator. Peng, Zhou, and Fu (2013) integrated social network and knowledge management theories to explore the mechanisms through which intra-team social networks affect team innovation performance. Qin, Zhao, Zhou, and Zhang (2015) examined the cross-level effects of participation-oriented human resource management practices on team creativity.

Other studies have explored how specific member behaviors influence team innovation capacity. Taggar (2002) found that whether individual creativity aggregates to team-level creativity depends on team creativity-relevant processes such as conflict management and team citizenship behavior. Similarly, Hoever, van Knippenberg, van Ginkel, and Barkema (2012) found that team diversity and members' perspective-taking jointly affect team innovation: when perspective-taking is high, diversity positively influences innovation; when low, the effect is non-significant. Tsai, Chi, Grandey, and Fung (2012) discovered that positive team affect only enhances team creativity when team trust is low and negative team affect is high. In China, Tang, Ai, and Gong (2011) examined how individual positive affect influences team creativity through tacit knowledge sharing. Yang, Hou, and Deng (2014) empirically investigated the effects of member heterogeneity on team innovation performance. Xu and Zhu (2016) explored the impact of employee proactive behavior on team innovation performance in equipment manufacturing firms.

2.3 Research on the Impact of Team Cultural Diversity on Team Innovation

Previous research on the relationship between team cultural diversity and innovation has produced inconsistent findings, with some scholars arguing that diversity facilitates innovation while others find it inhibits innovation.

2.3.1 Positive Effects of Team Cultural Diversity on Team Innovation

Chua (2018) found that individuals are more likely to receive culture-related new ideas and information in culturally diverse social networks. Sarala and Vaara (2010) demonstrated at the firm level that cultural differences and integration during mergers affect knowledge transfer. Zhan, Bendapudi, and Hong (2015) proposed that inconsistent findings in past research on ethnic-cultural diversity and innovation may stem from conceptual and empirical confusion between two diversity types. They distinguished ethno-cultural diversity into ethnic-categorical diversity (primarily national types) and cultural distance diversity, finding that cultural distance diversity positively affects innovation using national-level data. Harvey (2013) experimentally verified that deep-level diversity affects teams' ability to integrate innovative ideas, thereby influencing team innovation. van Knippenberg et al. (2004) proposed the categorization-elaboration model to examine the relationship between cultural diversity and team performance, arguing that diversity brings different knowledge, information, and problem perspectives that help teams generate more useful new ideas.

2.3.2 Negative Effects of Team Cultural Diversity on Team Innovation

Leung and Wang (2015) adopted a socio-technical systems perspective to theoretically analyze the negative effects of cultural diversity on team creativity. They argued that cultural diversity creates cultural identity barriers (identity threat and fragmentation) and intercultural obstacles that hinder knowledge sharing and integration, ultimately affecting team creativity. They proposed that information and communication technology moderates the relationship between cultural diversity and team innovation. Chua (2013) used social network analysis and laboratory studies to propose that ambient cultural disharmony reduces individuals' ability to effectively integrate knowledge from different cultures, thereby inhibiting individual innovation. The belief that cultural differences are irreconcilable mediates this relationship. Giambatista and Bhappu (2010) noted that surface-level diversity triggers social categorization processes that suppress the creative potential of multicultural teams. Dahlin, Weingart, and Hinds (2005) found that national diversity leads to social categorization, causing teams to focus on differences and impairing their ability to utilize information effectively.

2.3.3 Moderating Variables in the Relationship

Scholars have examined several team-level moderating factors. Shin and Zhou (2007) explored the moderating role of leadership style in the diversity-innovation relationship. Stahl et al. (2010) conducted a meta-analysis of 108 studies, finding that cultural diversity simultaneously creates process losses (through task conflict and reduced social integration) and process gains (through enhanced creativity and satisfaction), with environmental variables moderating these effects. They proposed potential moderators such as team size and age, though insufficient sample sizes prevented validation. Shin,

Kim, Lee, and Bian (2012) found that individual creative self-efficacy and transformational leadership positively moderated the relationship between deep-level cultural diversity and individual innovation. Leung and Wang (2015) suggested that information and communication technology, task complexity, and independence might moderate the relationship between cultural diversity and knowledge integration.

2.3.4 Mediating Variables in the Relationship

Most research on the internal mechanisms has adopted social identity/categorization theory (Tajfel & Turner, 1986) or an intercultural difficulties perspective, arguing that value differences and social norms across cultures create barriers such as communication obstacles and misunderstandings that affect team innovation. Based on social identity theory (Williams & O' Reilly, 1998), Carton and Cummings (2012) proposed that cultural faultlines in multicultural teams create two types of identity problems: identity threat, where other cultural groups are perceived as threatening one' s cultural identity prestige, leading to anxiety and behaviors that undermine other subgroups; and identity fragmentation, where lack of shared cultural identity reduces team identification and commitment. Identity threat correlates with internal conflict, while fragmentation relates to turnover. These negative social processes, termed cultural identity barriers, reduce knowledge sharing and organizational citizenship behaviors (Bock, Zmud, Kim, & Lee, 2005), ultimately harming team innovation.

2.4 Critical Review of Related Research

Synthesizing existing domestic and international research, we identify several issues requiring deeper investigation. First, literature on the diversity-innovation relationship has reached inconsistent conclusions. While some scholars argue that members from different cultural backgrounds bring varied perspectives and knowledge that facilitate knowledge absorption and innovation, others contend that cultural diversity creates internal conflict and trust crises that hinder knowledge exchange and obstruct innovation. Our review suggests these inconsistencies primarily stem from unclear theoretical frameworks and measurement methods for team cultural diversity. Second, research on the underlying mechanisms needs further development. While three theoretical perspectives—similarity-attraction theory, social identity/categorization theory, and information processing theory—have been used to explain the relationship, van Knippenberg et al.'s (2004) categorization-elaboration model suggests that two mechanisms may operate simultaneously. Few studies have examined both mechanisms concurrently. Third, contextual factors in the diversity-innovation relationship require expanded investigation. This study examines both internal (employee motivation and beliefs) and external (environmental stimuli and changes) contextual factors.

3. Research Framework

The core objective of this research is to clarify the theoretical framework and classification criteria of team cultural diversity from a categorization-elaboration model perspective, empirically examine its impact on team innovation, reveal the internal mechanisms and boundary conditions, and provide theoretical support and management recommendations for effectively managing multicultural teams. Specifically, our objectives are: (1) clarify the theoretical framework and develop a two-dimensional scale for team cultural diversity; (2) examine the impact relationship and internal mechanisms between cultural diversity and team innovation; (3) explore internal boundary conditions; and (4) explore external boundary conditions.

[Figure 1: see original paper]

3.1 Research Module 1: Theoretical Framework and Scale Development for Team Cultural Diversity

In Module 1, we identify unclear theoretical frameworks and measurement methods as the primary cause of inconsistent findings. We propose a two-dimensional framework distinguishing surface-level and deep-level cultural diversity and develop a corresponding measurement scale to refine academic definitions and measurements.

Team cultural diversity refers to teams composed of members from different cultural backgrounds (Cox, 1994). As global economic integration intensifies, cultural diversity in workplaces has garnered increasing attention. The relationship between cultural diversity and innovation has been extensively discussed, yet findings remain inconsistent. Some studies find positive effects (Chua, 2018; Perry-Smith & Shally, 2003; Stahl et al., 2010; Tadmor, Satterstrom, Jang, & Polzer, 2012), while others find negative or non-significant effects (Kirkman & Shapiro, 2001; Winkler & Bouncken, 2011).

These inconsistencies arise from theoretical confusion and inconsistent operationalization. Culture is a complex, multidimensional concept comprising both explicit material aspects (language, clothing, diet) and implicit subjective aspects (values, thinking patterns). Most studies measure diversity using either surface-level indicators (language, nationality, ethnicity) or deep-level indicators (cultural values, beliefs), leading to divergent results. For example, three members from the U.S., New Zealand, and India may share English as a common language (no surface-level diversity) but differ significantly in values (deep-level diversity). Using single-dimensional measures introduces substantial error.

Therefore, we propose that team cultural diversity comprises two dimensions:

surface-level cultural diversity (observable external attributes like nationality, race, language) and **deep-level cultural diversity** (psychological characteristics like values and beliefs that require time or appropriate measurement to assess). For measurement development, following DeVellis (2016), we will: (1) review existing measures to create an initial item pool (our research team has already compiled representative measures, see [Figure 2: see original paper]); (2) conduct in-depth field research at two multinational companies through interviews and open-ended surveys to generate preliminary items; (3) integrate literature-based and field-generated items, then invite expert review to create a draft questionnaire; (4) test the questionnaire for reliability and validity; and (5) conduct pre-tests with confirmatory factor analysis to ensure psychometric quality.

For calculating cultural diversity, we will use Blau' s (1977) heterogeneity index, widely adopted in diversity research (Kearney & Gebert, 2009):

$$D = 1 - \sum_{i=1}^{n} P_i^2$$

where D is the team cultural diversity index, P represents the proportion of team members in each cultural category, and i indicates the number of cultural categories. D ranges from 0 (no diversity) to 1 (maximum diversity), applied separately to surface-level and deep-level dimensions.

3.2 Research Module 2: Impact Mechanisms of Cultural Diversity on Team Innovation

Based on our two-dimensional framework, Module 2 examines how surface-level and deep-level cultural diversity affect team innovation through the "social categorization-information processing" lens (van Knippenberg et al., 2004).

[Figure 3: see original paper]

We hypothesize that **surface-level diversity negatively affects team innovation**. Surface-level differences in language, nationality, and ethnicity provide salient social cues that trigger social categorization. According to social categorization theory, members classify others as "in-group" (us) or "out-group" (them) based on similarity, showing greater trust and preference toward similar others. Similarity-attraction theory further suggests members prefer working with culturally similar colleagues because such interactions provide positive reinforcement. Hülsheger, Anderson, and Salgado's (2009) meta-analysis found that team-level background diversity negatively affected innovation. Consequently, multicultural teams are prone to social categorization, creating subgroups that hinder information exchange, sharing, and integration, thereby impairing team information processing and suppressing innovation.

Hypothesis 1: Surface-level cultural diversity negatively affects team innovation.

Hypothesis 2: Surface-level cultural diversity negatively affects team innovation by triggering social categorization, which reduces team information processing.

Conversely, we propose that **deep-level diversity positively affects team innovation**. Deep-level diversity in values and beliefs provides varied information and perspectives. According to information processing theory, team effectiveness depends on information quality, which improves when members contribute diverse inputs. Multicultural teams offer richer information sources than homogeneous teams, and the resulting task conflict can stimulate innovation (Hülsheger et al., 2009). As members strive to explain and reconcile different viewpoints, they engage in deeper information processing, enhancing decision quality and generating more innovative solutions. Research by Chua (2018), Niebuhr (2010), and Stahl et al. (2010) confirms that cultural diversity brings new knowledge that, through exchange and integration, stimulates creative ideas.

Hypothesis 3: Deep-level cultural diversity positively affects team innovation.

Hypothesis 4: Deep-level cultural diversity positively affects team innovation by enhancing team information processing.

Measurement of key variables:

- **Team innovation:** We adopt Shin and Zhou' s (2007) method, asking team leaders to rate their teams' innovation relative to similar teams on novelty, importance, and usefulness (1-5 scale). This leader-rated approach is widely accepted and reliable (van der Vegt & Janssen, 2003; Zhou & Shalley, 2003).
- **Team social categorization:** Following Meyer, Shemla, and Schermuly (2011), we ask members to report perceived cultural differences among team members across three characteristics (1-5 scale). High scores indicate stronger social categorization tendencies.
- **Team information processing:** We use Kearney and Gebert' s (2009) 4-item scale, with members rating their agreement (1-5) with statements such as "Team members openly share knowledge to complement each other' s shortcomings" and "Team members carefully consider each member' s unique viewpoints."

3.3 Research Module 3: Internal Boundary Conditions

Module 3 examines how internal cognitive factors—specifically team diversity beliefs and collective regulatory focus—moderate the diversity-innovation rela-

tionship.

[Figure 4: see original paper]

3.3.1 The Moderating Role of Team Diversity Beliefs

Diversity beliefs refer to the extent to which individuals believe diversity benefits team functioning (van Knippenberg & Haslam, 2003). Individuals with strong diversity beliefs view diversity as valuable and beneficial, while those with weak beliefs hold negative attitudes. Van Dick et al. (2008) found that diversity beliefs moderate the relationship between team diversity and team identification: when beliefs are strong, diversity positively affects identification; when weak, the effect is negative. Homan, Van Knippenberg, Van Kleef, and De Dreu (2007) found that in informationally diverse teams, strong diversity beliefs enhanced team performance. Ely and Thomas (2001) similarly found that when organizations emphasized diversity' s importance, employees reported higher-quality team relationships and felt more valued.

We propose that team diversity beliefs moderate the diversity-innovation relationship. When teams hold strong diversity beliefs, members value the unique knowledge from culturally different colleagues, engage in mutual learning, and enrich team knowledge. Conversely, weak diversity beliefs lead to negative attitudes and behaviors that undermine the diversity-innovation link.

Hypothesis 5: Team diversity beliefs moderate the relationship between team cultural diversity and team innovation.

H5a: Team diversity beliefs negatively moderate the relationship between surface-level diversity and team innovation, such that stronger beliefs weaken the negative effect.

H5b: Team diversity beliefs positively moderate the relationship between deep-level diversity and team innovation, such that stronger beliefs strengthen the positive effect.

3.3.2 The Moderating Role of Collective Regulatory Focus

Higgins' s (1997, 2000) regulatory focus theory distinguishes between promotion focus (concerned with growth and achieving positive outcomes) and prevention focus (concerned with security and avoiding negative outcomes). Although typically an individual-level construct, regulatory focus has been applied to teams, with studies showing it significantly affects team outcomes. Levine, Higgins, and Choi (2000) found promotion-focused teams showed greater risk preference, while prevention-focused teams exhibited conservative preferences. Florack and Hartmann (2007) found prevention-focused teams emphasized risk avoidance in investment decisions. Rietzschel (2011) found promotion-focused teams engaged in more innovative behaviors.

We propose that collective regulatory focus moderates the diversity-innovation

relationship. Promotion-focused teams, pursuing positive outcomes, will focus on diversity' s benefits and actively integrate differentiated information to maximize synergistic gains. Prevention-focused teams, concerned with safety, will avoid the differences and conflicts that diversity brings. Additionally, regulatory focus affects emotional responses to diversity: prevention-focused individuals, fearing failure, are more sensitive to negative outcomes, while promotion-focused individuals, seeking success, are more sensitive to positive outcomes. Since diversity has both positive and negative effects, promotion-focused teams will view it as a resource for development, while prevention-focused teams will adopt conservative behaviors to avoid risks.

Hypothesis 6: Collective regulatory focus moderates the relationship between team cultural diversity and team innovation.

H6a: In promotion-focused teams, the negative relationship between surface-level diversity and team innovation is weakened, while the positive relationship between deep-level diversity and team innovation is strengthened.

H6b: In prevention-focused teams, the negative relationship between surface-level diversity and team innovation is strengthened, while the positive relationship between deep-level diversity and team innovation is weakened.

3.4 Research Module 4: External Boundary Conditions

Module 4 examines external contextual factors—team innovation feedback and team tenure—as potential moderators.

[Figure 5: see original paper]

3.4.1 The Moderating Role of External Innovation Feedback

Drawing on performance feedback research (Van Dijk & Kluger, 2011), we define **team innovation feedback** as external authorities' evaluations of a team' s innovativeness, comprising positive feedback (affirmation) and negative feedback (criticism). Performance feedback research shows that feedback triggers emotional reactions that affect motivation and behavior. According to affective events theory (Weiss & Cropanzano, 1996), negative feedback generates emotions like anger and disappointment, reducing extra-role behaviors and increasing turnover intentions, while positive feedback produces pride and happiness, strengthening affective commitment and organizational citizenship behaviors (Belschak & Den Hartog, 2009).

We propose that innovation feedback moderates the diversity-innovation relationship. Positive feedback generates positive team affect, strengthening members' belongingness and commitment, increasing knowledge-sharing behaviors, and promoting innovation. Negative feedback produces negative affect, leading to unfavorable team evaluations and reduced proactive behaviors. Additionally,

based on team information-processing theory, feedback influences information integration and team learning. Positive feedback reinforces the value of diverse information, encouraging greater investment in diversity initiatives, while negative feedback creates doubt about information integration approaches.

Hypothesis 7: External innovation feedback moderates the relationship between team cultural diversity and team innovation.

H7a: Positive innovation feedback weakens the negative relationship between surface-level diversity and team innovation and strengthens the positive relationship between deep-level diversity and team innovation.

H7b: Negative innovation feedback strengthens the negative relationship between surface-level diversity and team innovation and weakens the positive relationship between deep-level diversity and team innovation.

3.4.2 The Moderating Role of Team Tenure

Team tenure refers to the total time a team has worked together. Harrison (2002) noted that as tenure increases, workflows become smoother and attention shifts from surface-level to deep-level characteristics. Harrison, Price, and Bell (1998) found that the negative effects of cultural diversity diminish over time. Sacco and Schmitt (2005) and Chatman and Flynn (2001) similarly found that surface-level diversity' s negative effects decrease while deep-level diversity' s effects strengthen over time.

We propose that the diversity-innovation relationship changes with team tenure. Initially, large cultural differences, unfamiliarity, and language barriers lead members to rely on surface-level cues for social categorization, resulting in low trust and poor cooperation. As tenure increases, interpersonal familiarity and trust grow, members recognize the incompleteness of initial surface-level categorizations, and they discover each other' s unique information and perspectives. This enables deeper information exchange and processing, promoting innovation.

Hypothesis 8: The effects of team cultural diversity on team innovation change with team tenure. As tenure increases, the negative effect of surface-level diversity weakens while the positive effect of deep-level diversity strengthens.

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4. Theoretical Contributions

As corporate internationalization accelerates, team composition increasingly exhibits cultural diversity. Case analyses of Huawei, Facebook, and other leading firms reveal that organizations increasingly recognize cultural diversity' s importance for development. Many managers expect employees from different backgrounds to contribute new experiences, perspectives, and viewpoints that enhance team innovation. Examining this relationship has become a common

challenge for internationalizing enterprises, necessitating academic investigation to inform management practice.

In academia, the relationship between team cultural diversity and innovation has attracted significant attention, yet conclusions remain inconsistent. On one hand, information processing theory suggests that diverse members bring new information, knowledge, and perspectives that expand cognitive resources and facilitate information exchange, sharing, and integration, thereby promoting innovation (Perry-Smith & Shalley, 2003). On the other hand, similarity-attraction and social categorization theories suggest that individuals favor similar others (“us”) and distance themselves from dissimilar others (“them”), creating subgroups that hinder knowledge sharing and obstruct innovation.

We attribute these inconsistencies to unclear theoretical frameworks and measurement approaches. While scholars agree culture is a complex, multidimensional concept (Zhao & Kang, 2011) comprising both explicit (language) and implicit (values) features, empirical research has typically used single-dimensional indicators without distinguishing between dimensions. This creates measurement bias—for instance, two English speakers from the U.S. and India may show no surface-level diversity but differ substantially in values. Therefore, we propose a two-dimensional framework distinguishing surface-level diversity (nationality, race, language) and deep-level diversity (values, beliefs), recommending Blau’ s (1977) heterogeneity index for each dimension to avoid measurement-induced inconsistencies.

Building on this framework, we integrate competing theoretical perspectives through the “categorization-elaboration” lens (van Knippenberg et al., 2004), proposing that diversity simultaneously triggers social categorization and information processing mechanisms with differential effects. Surface-level diversity, being easily observable, triggers social categorization that inhibits innovation by creating in-group/out-group divisions that impede knowledge sharing. Deep-level diversity, being less salient, triggers information processing that enhances innovation by providing diverse perspectives and stimulating deeper cognitive elaboration.

Recognizing that diversity produces both positive and negative effects, we investigate contextual factors that amplify benefits and reduce costs. While previous research has examined team attributes, task characteristics, and leadership styles (Stahl et al., 2010), our study expands the theoretical framework by examining internal cognitive factors (diversity beliefs, regulatory focus) and external contextual factors (innovation feedback, team tenure).

Specifically, we propose that when team members hold strong diversity beliefs or promotion focus, they value diversity’ s benefits, actively integrate different information, and maximize synergistic gains, thereby weakening surface-level diversity’ s negative effects and strengthening deep-level diversity’ s positive effects. Conversely, weak diversity beliefs or prevention focus amplify negative effects and diminish positive effects.

From an external perspective, we introduce the concept of team innovation feedback. Positive feedback generates positive affect, strengthens commitment, and encourages knowledge-sharing behaviors that enhance innovation, while negative feedback produces discouragement and reduces proactive behaviors. Additionally, team tenure moderates the relationship as members shift attention from surface-level to deep-level characteristics over time, with increasing familiarity enabling deeper information integration.

This study offers three practical contributions. First, it helps enterprises manage cross-cultural teams more effectively by providing a two-dimensional framework and examining mechanisms and boundary conditions. Second, it guides human resource optimization by recommending that firms treat team diversification as a strategic goal, recruiting employees from diverse backgrounds while considering their values, diversity beliefs, and intrinsic motivation to leverage deep-level diversity for innovation. Third, it supports Chinese enterprises "going global" and foreign enterprises entering China by providing theoretical guidance on cross-cultural recruitment and team management.

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Note: Figure translations are in progress. See original paper for figures.