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Research paper

Top management team conflict and exploratory innovation: The mediating impact of market orientation

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ABSTRACT

Drawing on upper echelon theory, this study examines the linkage of top management team (TMT) conflict to exploratory innovation and the mediating impact of market orientation (MO) on the linkage. It finds that cognitive conflict in TMTs positively affects exploratory innovation, while affective conflict has a negative effect. Moreover, MO is a critical conduit through which TMT conflict plays its role in exploratory innovation. These findings advance our knowledge on the antecedents of exploratory innovation, improve our understanding about the linkage of TMT conflict to innovation, and identify additional antecedents and consequences for MO.

1. Introduction

Exploratory innovation, a critical type of firm innovation, is "designed to meet the needs of emerging customers or markets" by offering new designs, creating new markets, and developing new channels of distribution (Alexiev, Jansen, Van den Bosch, & Volberda, 2010, p. 1345). It relies on new knowledge departing from what firms already know (Jansen, Van Den Bosch, & Volberda, 2006; Su & Yang, 2018). Marketing and innovation scholars both have found that exploratory innovation assists firms in coping with environmental change, particularly discontinuous change, and then contributes to long-term success (Atuahene-Gima, 2005; Phelps, 2010). Hence, firms "are confronted with the need to facilitate or champion exploratory innovation" (Alexiev et al., 2010, p. 1343), raising a vital research question: what are the antecedents to exploratory innovation (Tuncdogan, Boon, Mom, Van Den Bosch, & Volberda, 2017; Wang, Rodan, Fruin, & Xu, 2014).

Drawing on upper echelon theory, which suggests that a firm's top management team (TMT) plays a key role in its strategic decisions and corresponding outcomes (e.g. Carpenter, Geletkanycz, & Sanders, 2004; Hambrick, 2007), scholars argue that TMTs determine whether a firm will engage in exploratory innovation. Yet, not all TMTs are able to develop exploratory innovation successfully (Kaplan, Murray, & Henderson, 2003; Li, Lin, & Huang, 2014). Scholars have thereby explored the antecedent effects of various TMT- related factors, such as leadership, social capital, advice-seeking, and regulatory foci (Alexiev et al., 2010; Jansen, Vera, & Crossan, 2009; Li et al., 2014; Tuncdogan et al., 2017). Although such studies have evidenced the importance of TMT-related factors in stimulating exploratory innovation, few have examined the role played by conflict in TMTs. Conflict is inevitable in any TMT (Amason, 1996; Jehn, 1995). For instance, marketing and R&D managers often clash over key decisions (Song, Dyer, & Thieme, 2006). This suggests that TMT conflict must be investigated to inform TMTs how to manage conflict when they seek to foster exploratory innovation (De Clercq, Thongpapanl, & Dimov, 2009).

Scholars have linked TMT conflict to firm innovation; yet, they can hardly illustrate the role played by TMT conflict in exploratory innovation due to two research limitations. First, although extant studies have emphasized on several types of innovation, such as organizational innovation or innovativeness (e.g., Camelo-Ordaz, García-Cruz, & Sousa-Ginel, 2015; Chen, Liu, & Tjosvold, 2005; Prasad & Junni, 2017; Qian, Cao, & Takeuchi, 2013), few have paid attention to exploratory innovation. Since distinct types of innovation differ in embodied knowledge, a given factor may affect exploratory innovation differently from other types of innovation (Jansen et al., 2006). Accordingly, extant findings on the TMT conflict- innovation linkage cannot be directly applied to exploratory innovation, leading to the impact of TMT conflict on exploratory innovation remain unclear (Su & Yang, 2018).

Second, extant studies have mainly focused on the direct linkage between TMT conflict and innovation, while few studies have identified the conduits by which TMT conflict works, leaving the question of how TMT conflict influences innovation unanswered (Camelo-Ordaz et al., 2015; Mooney, Holahan, & Amason, 2007). Upper echelon theory

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implies that TMTs are decision-makers and function through determining a firm's strategic decisions (Carpenter et al., 2004; Hambrick, 2007). Thus, the implications of TMT-related factors come true by affecting strategic decisions (Alexiev et al., 2010; Talke, Salomo, & Kock, 2011). As a result, to probe more deeply in the linkage between TMT conflict and exploratory innovation it is imperative to clarity important strategic factors that can mediate the linkage (Chen et al., 2005; De Dreu, 2006).

This study addresses these limitations. In particular, conflict includes both cognitive conflict, which is task-oriented and arises from differences in perspectives, and affective conflict, which is emotional and arises from personal incompatibilities (Amason, 1996; Jehn, 1995). The two types of conflict affect innovation in distinct ways (De Clercq et al., 2009; Song et al., 2006). Thereby, this study investigates their effects on exploratory innovation separately. In addition, exploratory innovation aims at meeting "the needs of emerging customers or markets" (Alexiev et al., 2010, p. 1345). It requires firms searching, understanding, and serving potential customers and markets (Phelps, 2010). Market orientation (MO) is a strategic posture towards thoroughly understanding extant and potential customers and competitors and inter-functionally coordinating resources and activities to create superior customer value continuously (Filatotchev, Su, & Bruton, 2017). MO, therefore, may play a key role in stimulating exploratory innovation. Furthermore, since a TMT determines a firm's strategic direction, TMT-related factors such as conflict have profound effects on its MO (Kirca, Jayachandran, & Bearden, 2005; Talke et al., 2011). Thus, MO may serve as a conduit by which TMT conflict plays its role in exploratory innovation. As a result, this study also examines the mediating effect of MO on linkage between TMT conflict and exploratory innovation.

This study generates three theoretical contributions. First, we take TMT conflict and MO as antecedents of exploratory innovation, responding directly to the call for testing its determinants (Alexiev et al., 2010; Wang et al., 2014). Second, by contextualizing the role of TMT conflict in an overlooked yet critical type of innovation – exploratory innovation – and employing marketing insights to identify MO as a mediator, we advance the understanding of TMT conflict-innovation linkage (De Clercq et al., 2009; Qian et al., 2013). Third, this study finds that TMT conflict has a profound effect on MO and exploratory innovation refers to a key outcome of MO, extending our knowledge on the antecedents and consequences of MO. Moreover, this study is rich in practical value, in that it aids in top managers, especially marketing and R&D managers, taking advantage of TMT conflict to foster exploratory innovation.

2. Literature review and hypothesis development

2.1. Exploratory innovation and TMTs

Exploratory innovation refers to a key type of firm innovation aimed at "meeting the needs of emerging customers or markets" by providing new designs, creating new products, developing new channels of distribution, and so on (Alexiev et al., 2010, p. 1345). To develop it a firm needs to depart from its familiar knowledge (Jansen et al., 2006). This innovation has significant value, because it helps cope with environmental change, particularly discontinuous change (Atuahene-Gima, 2005; Phelps, 2010). Firms, thereby, are keen to develop exploratory innovation, leading to what are its antecedents a serious question (Jansen et al., 2006; Tuncdogan et al., 2017; Wang et al., 2014).

Scholars from different research areas, such as marketing and innovation, have explored the effects a range of constructs on exploratory innovation, such as marketing factors, organizational factors, firm's resources and connections, and environmental factors (Gilsing, Nooteboom, Vanhaverbeke, Duysters, & Van den Oord, 2008; Jansen et al., 2006; Phelps, 2010; Su & Yang, 2018; Wang et al., 2014). Besides such factors, TMTs also have profound effects, because top managers should "become involved as product champions or organizational sponsors to exploratory innovation initiatives" (Alexiev et al., 2010, p. 1346). Yet, many TMTs fail to develop exploratory innovation (Kaplan et al., 2003; Li et al., 2014), making it vital to identify strategies TMTs can deploy to foster exploratory innovation (Li et al., 2014).

Drawing on upper echelon theory, scholars indicate that TMT-related factors have profound effects on a firm's strategic decisions and outcomes (Chen et al., 2005; Qian et al., 2013). In line of this thought, scholars suggest that TMT-related factors also affect exploratory innovation, and they have tested the role of several TMT-related factors. For example, Jansen et al. (2009) found that transformational leadership in a TMT has a positive impact on exploratory innovation, while transactional leadership has a negative one. Alexiev et al. (2010) reported that advice seeking of a TMT contributes to exploratory innovation, and TMT heterogeneity aids in exploiting internal advice but inhibits using external advice. Li et al. (2014) indicated that TMT's external relations foster exploratory innovation. Tuncdogan et al. (2017) found that regulatory foci of a TMT has a strong effect on exploratory innovation. Overall, TMTs play a key role in exploratory innovation and additional TMT-related factors, such as conflict, should be examined to further elaborate the antecedents of exploratory innovation (Alexiev et al., 2010; Tuncdogan et al., 2017).

2.2. TMT conflict and its effects on firm innovation

Conflict is inevitable in any TMT, because every top manager has a unique functional focus that reflects his/her role in the firm (Jehn, 1995). For instance, TMT conflict often arises between marketing and R&D managers (De Clercq et al., 2009). Marketing managers highlight satisfying customer needs whereas R&D managers emphasize on technical issues. They often disagree with each other over key decisions and compete for scarce organizational resources, sowing the seeds of TMT conflict (Qian et al., 2013; Song et al., 2006).

Conflict is multidimensional that involves cognitive conflict (also labeled as task, functional, or constructive conflict) and affective conflict (also as relationship, dysfunctional, or destructive conflict) (Amason, 1996; De Clercq et al., 2009). Cognitive conflict is task-oriented and caused by differences in perspective, while affective conflict is emotional and often arises from personal incompatibilities or disputes (Jehn, 1995; Parayitam & Dooley, 2009). The two kinds of conflict can engender distinctive behaviors and produce contrasting outcomes (De Dreu, 2006). Thereby, they are often examined individually (Amason & Sapienza, 1997; Mooney et al., 2007).

Existing studies have made many investigations on the implications of conflict. In particular, scholars in marketing, innovation, and other research areas have explored the conflict-innovation linkage at multiple levels, such as between marketing and R&D departments, within departments, and in teams (De Clercq et al., 2009; De Dreu, 2006; Matsuo, 2006; Song et al., 2006). However, the role played by TMT conflict "has rarely been analyzed" (Camelo-Ordaz et al., 2015, p. 960). In Table 1, we summarize prior literature on the effects of TMT conflict on firm innovation and some studies on the conflict-innovation linkage at other levels. As Table 1 shows, TMT conflict strongly influences firm innovation. For example, Chen et al. (2005) found a positive impact of productive conflict in TMTs on organizational innovation. Qian et al. (2013) reported that TMT cognitive conflict has a positive effect on organizational innovation, while affective conflict has a negative impact. Camelo-Ordaz et al. (2015) found that relationship and task conflict in TMTs both negatively affect firm innovativeness. Prasad and Junni (2017) reported that TMT affective conflict has a negative linkage to firm innovativeness, while cognitive conflict has a curvilinear one. Overall, TMT conflict has strong innovation implications and should be properly managed to foster innovation in firms (De Clercq et al., 2009).

Moreover, while marketing scholars have examined the effect of conflict on firm innovation, they focused on conflict at the department level, such as that within sales departments or between marketing and

Table 1
A summary of the literature on the conflict-innovation linkage.

Innovation types and the definitions	Conflict types	Contexts	Findings	Source
Organizational innovation: [No definition is provided].	Conflicts in TMT	105 Chinese firms	Productive conflict has a positive impact on organizational innovation.	Chen et al. (2005)
Organizational innovation: generating and implementing new ideas or behaviors, including new products, services, process technologies, organizational structures, or administrative systems.	Conflicts in TMT	122 Chinese firms	Cognitive conflict has a positive impact on organizational innovation, but affective conflict has a negative effect.	Qian et al. (2013)
Firm innovativeness: the tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes.	Conflicts in TMT	64 Spanish firms	Both task conflict and relationship conflict have negative effects on firm innovativeness.	Camelo-Ordaz et al. (2015)
Firm innovativeness: the introduction and implementation of new or improved products, services and production processes.	Conflicts in TMT	171 Indian firms	Affective conflict is negatively related to firm innovativeness, but cognitive conflict has a negative curvilinear relationship with it.	Prasad and Junni (2017)
Departmental innovativeness: an organizational tendency that supports innovation in sales departments, and not as an innovation itself.	Conflicts in sales departments	193 Japanese firms	Task conflict has a positive impact on innovativeness, whereas relationship conflict has a negative effect.	Matsuo (2006)
Organizational innovation: the extent to which a firm develops new products and services or pursues innovations for customers or markets	Conflicts between departments	232 Canadian firms	Relationship conflict has a negative effect on organizational innovation, yet task conflict has a positive impact.	De Clercq et al. (2009)
Innovation performance: the overall success of a firm's new product development program	Conflicts between R&D and marketing departments	122 US firms	Destructive conflict has a negative impact on innovation performance, but constructive conflict has a positive effect.	Song et al. (2006)
Innovation in teams: the intentional introduction and application in a role, group or organization of ideas, processes, products or procedures, new to relevant units of adoption, designed to benefit the individual, the group, the organization or wider society.	Conflicts in work teams	Teams in Netherlands	Task conflict has a curvilinear effect on innovation in teams, yet relationship conflict does not have significant effect.	De Dreu (2006)

R&D departments (e.g. Matsuo, 2006; Song et al., 2006). Little attention has been paid to TMT conflict. Marketing scholars also has not linked TMT-related factors to exploratory innovation, though they have identified some marketing factors as the antecedents of exploratory innovation (Atuahene-Gima, 2005; Li et al., 2014). Thus, the role of TMT conflict in exploratory innovation represents a serious issue for marketing scholars.

Extant findings on the TMT conflict-innovation linkage cannot, however, address this issue due to two research limitations. First, while studies have explored some types of firm innovation (Prasad & Junni, 2017; Qian et al., 2013), they have not considered exploratory innovation. As a unique type of firm innovation, exploratory innovation differs significantly from other types of innovation regarding the knowledge it embodies, because it requires completely new knowledge departing from what firms typically use to pursue other types of innovation (Alexiev et al., 2010; Gilsing et al., 2008). Thus, a given factor often affects exploratory innovation and other types of innovation differentially (Su & Yang, 2018), resulting in it difficult to apply findings pertaining to the effects of TMT conflict on other types of innovation to exploratory innovation (Jansen et al., 2006; Tuncdogan et al., 2017).

Second, it remains unclear on how TMT conflict matters. Upper echelon theory argues that the implications of TMT-related factors come true by affecting strategic decisions (Alexiev et al., 2010; Talke et al., 2011). Hence, certain strategic factors may mediate the linkage between TMT conflict and exploratory innovation. Prior studies have, however, tested the direct effect of TMT conflict on firm innovation; few of them have clarified strategic factors that serve as conduits by which TMT conflict work (Mooney et al., 2007). This lack of investigations makes it difficult to illustrate how TMT conflict affects exploratory innovation (Camelo-Ordaz et al., 2015), making it vital to clarify strategic factors that mediate the linkage (Chen et al., 2005; De Dreu, 2006). In summary, to address such two limitations, this study explores the linkage between TMT conflict and exploratory innovation and tests the mediating effect of MO on the linkage.

2.3. TMT conflict and exploratory innovation

Given that cognitive and affective conflict differ from each other and often result in distinct behaviors, generate distinct outcomes, and affect innovation differentially (Amason & Sapienza, 1997; De Dreu, 2006; Jehn, 1995; Parayitam & Dooley, 2009), this study explores the effects of both TMT cognitive and affective conflict on exploratory innovation.

We argue that the effect of TMT cognitive conflict on exploratory innovation is positive, for two reasons. First, cognitive conflict can help TMTs find out opportunities to pursue exploratory innovation. Since cognitive conflict arises from differences in perspectives on how to better take tasks (Amason, 1996), it requires TMT members to exchange knowledge (Parayitam & Dooley, 2009). The conflict, thus, enables a TMT to broaden the scope of its knowledge base (Amason & Sapienza, 1997). Moreover, TMT cognitive conflict is “an antidote to core rigidities”, because it forces the TMT to constantly to reexamine and challenge dominant perspectives within the firm (Leonard-Barton, 1995, p. 89). Thus, a TMT that experiences cognitive conflict not only is likely to search for potential and emerging customers and markets along new technological trajectories opened up by new knowledge, but also is good at understanding the needs of such customers and markets (Dayan, Ozer, & Almazrouei, 2017; De Clercq et al., 2009; Mooney et al., 2007). Accordingly, cognitive conflict in TMTs opens up opportunities for exploratory innovation.

Second, cognitive conflict aids in a TMT taking advantage of opportunities for exploratory innovation. On the one hand, as Amason (1996, p. 27) indicated, cognitive conflict “contributes to decision quality because the synthesis that emerges from the contesting diverse perspectives is generally superior to the individual perspectives themselves”. Cognitive conflict in TMTs makes TMT members discuss a wide

range of opinions and then accommodate and synthesize multiple points of view (Jehn, 1995). Thus, a TMT experiencing cognitive conflict can make high-quality decisions on whether or not take advantage of opportunities for exploratory innovation and how to pursue them (Amason & Sapienza, 1997). On the other hand, since the discussion on multiple views promotes a better understanding on decisions, TMT cognitive conflict is beneficial for the implementation of decisions (De Clercq et al., 2009). Overall, TMT cognitive conflict facilitates exploratory innovation through helping TMTs identify and exploit opportunities for it.

Hypothesis 1. There is a positive relationship between TMT cognitive conflict and exploratory innovation.

In terms of TMT affective conflict, we expect that it has a negative influence on exploratory innovation with two reasons. First, TMT affective conflict inhibits identifying opportunities for exploratory innovation. Since affective conflict arises from personal incompatibilities or disputes, it causes suspicion, distrust, and hostility among TMT members (Amason, 1996). Therefore, they must divert more attention and time to their relationships with other members instead of focusing on tasks such as searching and understanding emerging and potential customers and markets (De Clercq et al., 2009; Parayitam & Dooley, 2009). Affective conflict also impedes the flow of new knowledge in the TMT's knowledge base (Ensley, Pearson, & Amason, 2002). Moreover, this conflict generates core rigidities, because it forces the TMT to follow familiar technological trajectories rather than departing from them (Jehn, 1995). This makes it difficult for the TMT to find out opportunities to develop exploratory innovation (Mooney et al., 2007). In summary, TMT affective conflict plays a negative role in identifying opportunities for exploratory innovation.

Second, TMT affective conflict impedes exploiting opportunities for exploratory innovation. Prior studies have indicated that affective conflict hurts the quality of decisions, in that it creates animosity and distracts team members from the work at hand (Amason, 1996). Affective conflict in a TMT engenders suspicion, distrust, and hostility between TMT members, which discourages them sharing knowledge, distracts their attention, and erodes their commitment (De Dreu, 2006; Parayitam & Dooley, 2009). Thus, TMT affective conflict interferes with evaluative processes to exploit identified opportunities for exploratory innovation and then inhibits making high-quality decisions on how to pursue the opportunities (Qian et al., 2013). TMT affective conflict inhibits implementing decisions on exploratory innovation also. On the one hand, this conflict provokes negative emotions in TMT members, preventing them from fully considering steps to implement decisions (Amason & Sapienza, 1997). On the other hand, such a conflict often involves personal disagreements and even power struggles between TMT members (De Clercq et al., 2009), which makes some members dissatisfied, lowers their willingness to accept decisions, and reduces the effectiveness of taking decisions into action (Chen et al., 2005). Overall, TMT affective conflict impedes both identifying opportunities for exploratory innovation and taking advantage of them. Thus, it plays an adverse role in exploratory innovation.

Hypothesis 2. There is a negative relationship between TMT affective conflict and exploratory innovation.

2.4. The mediating impact of MO

As a critical marketing construct, MO reflects a firm's strategic posture towards thoroughly understanding existing and potential customers and competitors and coordinating resources and activities interfunctionally to create superior customer value on an ongoing basis (Ketchen Jr., Hult, & Slater, 2007; Narver & Slater, 1990). MO holds three dimensions: customer orientation (understanding customers' needs and wants), competitor orientation (understanding competitors' strengths and weaknesses and how they meet customers' needs and wants), and inter-functional coordination (the firm-wide use of resources to create customer value) (Ellis, 2006; Slater & Narver, 1994).

MO has significant performance implications (Kumar, Jones, Venkatesan, & Leone, 2011). For instance, Kirca et al. (2005) conducted a meta-analysis and indicated that the MO-performance linkage is positive for a range of performance measures. MO fosters innovation as well. For example, Han, Kim, and Srivastava (1998) reported that MO has profound effects on both technical and administrative innovations. Im and Workman (2004) found that MO contributes to new product success by improving creativities in new product and marketing programs. Augusto and Coelho (2009) reported a positive linkage of MO to new-to-the-world products. In summary, MO attracts continued scholarly attention on its consequences (Ellis, 2006; Guo, Kulviwat, Zhu, & Wang, 2018).

While many studies have tested the innovation implications of MO, few have linked MO to exploratory innovation. This study has two reasons to expect for a positive relationship between MO and exploratory innovation. First, MO aids in firms identifying opportunities for exploratory innovation. Given that exploratory innovation aims at meeting “the needs of emerging customers or markets” (Alexiev et al., 2010, p. 1345), it asks for clarifying the needs of emerging customers and markets (Wang et al., 2014). MO encourages searching, understanding, and serving potential and emerging customers and markets (Filatotchev et al., 2017). Hence, a highly market-oriented firm is more easily to find out opportunities for exploratory innovation.

Second, MO helps firms successfully capture opportunities to pursue exploratory innovation. Exploratory innovation is built on a trajectory far away from extant technological trajectories and market segments (Alexiev et al., 2010; Gilsing et al., 2008). To pursue opportunities for this kind of innovation, a firm should leverage firm-wide resources as well as inter-functionally coordinate activities to meet various requirements generated by the innovation (Gilsing et al., 2008; Wang et al., 2014). MO facilitates inter-functional coordination of resources and activities (Ketchen Jr. et al., 2007). It, thus, aids in satisfying requirements generated in the process of pursuing opportunities for exploratory innovation and then reaching success (Atuahene-Gima, 2005; Kirca et al., 2005). In summary, MO contributes to identifying and pursuing opportunities to engage in exploratory innovation; accordingly, it has a positive relationship with exploratory innovation.

Hypothesis 3. There is a positive relationship between MO and exploratory innovation.

Given the significance of MO, scholars have examined its antecedents and found that TMT- related, interdepartmental, organizational, and environmental factors all have strong effects on it (Kirca et al., 2005; Kohli & Jaworski, 1990). For example, Zhou, Gao, Yang, and Zhou (2005) indicated that top managers' positive attitudes towards change and a participative organizational culture are helpful for developing MO. Kirca et al. (2005) reported that top management emphasis plays a positive role. Talke et al. (2011) found that TMT diversity has a positive effect on MO. Overall, existing studies have shed light on the antecedents of MO; yet, to advance our understanding it is vital to continue identifying its determinants (Guo et al., 2018; Kirca et al., 2005).

Scholars have found that TMT-related factors can affect MO (Talke et al., 2011; Zhou et al., 2005). Following this line of studies, we suggest that TMT conflict has profound impact on MO. In particular, we argue for a positive effect of TMT cognitive conflict on MO due to two reasons. First, cognitive conflict encourages TMT members to be market-oriented. This conflict facilitates TMT members exchanging knowledge on customers and markets; it thereby helps them agree on the significance of staying close to customers and prioritizing customer value (Guo et al., 2018). Moreover, by serving as “an antidote to core rigidities” (Leonard-Barton, 1995, p. 89), cognitive conflict pushes TMTs to utilize new technologies to seek new customers (De Clercq et al., 2009). Thus, a TMT experiencing a high level of cognitive conflict

is more willing to study current and potential customers and competitors and inter-functionally coordinate resources and activities to create customer value (Ketchen Jr. et al., 2007).

Second, cognitive conflict improves a TMT's abilities to function with an MO. This conflict enables the team to acquire new knowledge, broadening the scope of its knowledge base (Ensley et al., 2002). This helps the TMT understand the needs of emerging and potential customers and markets as well as the approaches taken by actual and potential competitors to satisfy customers' needs and wants, which assists in better utilizing its resources to maximize customer value (Ellis, 2006; Filatotchev et al., 2017). In summary, TMT cognitive conflict contributes TMTs to making and implementing market-oriented decisions; it thus has a positive effect on MO.

Hypothesis 4. There is a positive relationship between TMT cognitive conflict and MO.

In term of TMT affective conflict, we have two reasons to argue that it has a negative effect on MO. First, affective conflict impedes a TMT making market-oriented decisions. Because this conflict can cause suspicion, distrust, and hostility among TMT members (Amason, 1996), TMT members experiencing affective conflict have difficulties to reach agreements on staying close to customers and placing a priority on customer value (Guo et al., 2018). They are distracted from MO-related tasks such as searching and serving emerging customers and markets (De Clercq et al., 2009). Moreover, affective conflict forces a TMT to stay in extant technological trajectories and markets instead of developing new ones (Amason & Sapienza, 1997; Jehn, 1995). Hence, a TMT experiencing affective conflict often lacks the will to be market-oriented.

Second, affective conflict inhibits a TMT improving abilities to support MO. TMT affective conflict undermines the TMT's effort to acquire new knowledge, thereby limiting the scope of its knowledge base and preventing the members from developing new abilities (Ensley et al., 2002). This in turn makes the TMT have difficulties to understand the needs of emerging and potential customers and markets and weakens its abilities serve these customers and markets (Ellis, 2006). Thus, affective conflict prevents a TMT from effectively deploying MO. Overall, TMT affective conflict has negative effects on both motivation and abilities of the TMT to make and implement market-oriented decisions; it thereby plays a negative role in MO.

Hypothesis 5. There is a negative relationship between TMT affective conflict and MO.

Upper echelon theory states that TMTs play role by affecting their firms' strategic decisions (Carpenter et al., 2004; Hambrick, 2007), meaning that the effect of TMT conflict on exploratory innovation comes true through influencing strategic decisions. Drawing on this statement as well as the relationships between TMT conflict, MO, and exploratory innovation discussed above, we argue MO as a conduit through which TMT conflict affects exploratory innovation. In particular, cognitive conflict helps a TMT make and implement market-oriented decisions, in turn enabling its firm to develop exploratory innovation; whereas affective conflict has the opposite effects.

Hypothesis 6. MO mediates the positive relationship between TMT cognitive conflict and exploratory innovation.

Hypothesis 7. MO mediates the negative relationship between TMT affective conflict and exploratory innovation.

3. Methods

3.1. Sample and data collection

We used data on Chinese firms to test our hypotheses for three reasons. First, because China is a collectivist society that emphasizes on interpersonal harmony and group orientation, Chinese managers endeavor to avoid conflict (Chen et al., 2005). However, conflict is still often occurred in Chinese TMTs and has significant effects on both the team and the firm, making China a good context to test the applicability of the findings on TMT conflict obtained from Western countries that hold an individualism culture (Lee et al., 2017; Qian et al., 2013). Second, prior studies have found that TMTs play a critical role in generating innovation in Chinese firms, in that only TMTs can leverage internal and external resources to overcome difficulties for innovation (Chang, Bai, & Li, 2015). The wide variation in the development of exploratory innovation across Chinese firms is also likely to be caused by TMT-related factors such as conflict (Lin, McDonough, Yang, & Wang, 2017). Third, because China's institutional transitions ask firms to be market-oriented, MO strongly contributes to their success. Yet, few studies have investigated how MO works, creating a need to test the role played by MO in Chinese firms (Filatotchev et al., 2017).

To collect our data we took a survey on manufacturing firms located in six provinces (Anhui, Guangdong, Henan, Jiangsu, Shaanxi, and Shanghai). Such locations cover a diverse area, which minimizes bias caused by characters specific to certain area. We gathered the data in three phases. First, we developed a questionnaire based on prior studies and modified it after discussing it with several mangers. We then made a pilot test on 20 firms, who were excluded from the final study. We revised the questionnaire using feedback from the pilot study. We prepared the questionnaire in English, translated it to Chinese, and then had a third party to back-translate it. No substantial differences in meaning for any scale were found between the two translations. To avoid common method bias, we divided the questionnaire into two parts and required two executives from each firm to answer two parts separately (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Second, we obtained a list of manufacturing firms from governments and business research firms in abovementioned provinces. These governments and firms were willing to help, because we promised to send them a report on collected data. We randomly selected 1200 firms from the list. To increase the response rate, we conducted a telephone survey before the formal survey.

Finally, we utilized the face-to-face interview method to obtain responses. We preferred this method to a mail or online survey, since it enables interviewers to clarify respondents' queries on the spot, prevents executives from asking the secretaries to fill out the survey, and ensures that all responses are complete. Interviewers were PhD students and professors in relevant research area from Chinese universities, most of whom had participated in at least one face-to-face interview survey. Before embarking on the interview process, interviewers had been trained on background information, interview skills, and the exact meanings of all questions in the questionnaire. When conducting interviews, interviewers explained the intent of this survey and promised to keep the responses confidential. Then, they asked two executives in each firm to complete one part of the questionnaire individually.

We collected our data during the first half of 2014, obtaining responses from 249 firms after deleting responses with missing data and firms with only one executive responding. To check for non-response bias, we used *t*-tests to compare responding and non-responding firms along major attributes such as firm age and ownership status. All t-statistics were insignificant. Furthermore, we divided the sample into two groups based on the time at which they agreed to be interviewed. We did not find significant differences between two groups (Armstrong & Overton, 1977). Thus, there is no serious non-response bias in our survey.

3.2. Measures

All questionnaire items, unless stated otherwise, are measured on a five-point scale with “1” representing “strongly disagree” and “5” representing “strongly agree.” Moreover, the method of using the mean value of all items, which has been widely used, was employed to

Table 2
Standard estimates and alpha coefficients.

Variables and items	Loading
TMT cognitive conflict (*Alpha* = 0.826)	
1. TMT members often have different ideas about how things should be done.	0.823
2. TMT members often debate or discuss ideas about how things should be done.	0.798
3. TMT members often have different ideas related to the tasks at hand.	0.873
4. TMT members often debate or discuss ideas related to the tasks at hand.	0.750
TMT affective conflict (*Alpha* = 0.845)	
1. TMT members seldom get angry while working in the team.	0.858
2. TMT members seldom clash with others while working in the team.	0.874
3. There is little tension between TMT members while working in the team.	0.819
4. There is little jealousy or rivalry between TMT members while working in the team.	0.753
Market orientation (*Alpha* = 0.768)	
Customer orientation (Alpha = 0.863)	
1. Our business objectives are driven primarily by customer satisfaction.	0.802
2. We constantly monitor our level of commitment and orientation to serving customers' needs.	0.864
3. Our strategy for competitive advantage is based on our understanding of customers' needs.	0.786
4. Our business strategies are driven by our beliefs about how we can create greater value for customers.	0.794
5. We measure customer satisfaction systematically and frequently.	0.777
Competitor orientation (Alpha = 0.850)	
1. Our salespeople regularly share information within our business concerning competitors' strategies.	0.755
2. We respond rapidly to competitive actions that threaten us.	0.845
3. Our top management team regularly discusses competitors' strategies.	0.798
4. Our top management team regularly discusses competitors' strengths.	0.798
5. We target customers where we have an opportunity for competitive advantage.	0.760
Cross-functional integration (Alpha = 0.875)	
1. We freely communicate technological and market information and so on.	0.820
2. We freely communicate information about our successful and unsuccessful customer experiences across all business functions.	0.838
3. All of our business functions are integrated in serving the needs of our target markets.	0.853
4. All of our managers understand how everyone in our business can contribute to creating customer value.	0.777
5. All functional groups work hard to thoroughly and jointly solve problems.	0.821
Exploratory innovation (*Alpha* = 0.901)	
1. We accept demands that go beyond existing products and services.	0.723
2. We invent new products and services.	0.839
3. We commercialize products and services that are completely new.	0.846
4. We experiment with new products and services in our local market.	0.817
5. We frequently utilize new opportunities in new markets.	0.737
6. We regularly search for and approach new clients in new markets.	0.742
7. We regularly use new distribution channels.	0.835
Technological turbulence (*Alpha* = 0.851)	
1. The technology in our industry is changing rapidly.	0.830
2. The rate of technology obsolescence is high in our industry.	0.871
3. It is difficult to forecast the technology development direction in our industry.	0.827
4. Technological changes provide substantial opportunities in our industry.	0.798
Market turbulence (*Alpha* = 0.834)	
1. Market demands change frequently over time.	0.880
2. The volume and composition of market demands are difficult to forecast.	0.821
3. The evolution of customer preference is difficult to predict.	0.811
4. New demands in the market are significant difference from existing ones.	0.758
Competitive intensity (*Alpha* = 0.834)	
1. Price competition is a hallmark of our industry.	0.855
2. One hears of a new competitive move almost every day.	0.832
3. Any action that a company takes, others can make a response swiftly.	0.731
4. Competition in our industry is cutthroat.	0.851

operationalize multi-item constructs (Kumar et al., 2011).

Drawing on Mooney et al. (2007) and Qian et al. (2013), we respectively used four items to measure TMT cognitive and affective conflict. We measured MO by fifteen items adopted from Atuahene-Gima (2005) and Han et al. (1998). Following Jansen et al. (2006), we utilized seven items to measure exploratory innovation. We controlled for six variables: firm size, age, industry, technological turbulence, market turbulence, and competitive intensity. Firm size referred to the number of full-time employees in a firm and was measured by a six-point scale that ranges from “fewer than 20” to “more than 1,000”. Industry was taken as dummies including food, chemical, electronics, textile, metal processing, and others. We measured technological turbulence, market turbulence, and competitive intensity using items adopted from Jaworski and Kohli (1993) and Gatignon and Xuereb (1997). All measures are shown in Table 2.

3.3. Reliability and validity

We estimated composite reliability by Cronbach's *alpha* (Cronbach, 1971). All *alpha* values reported in Table 2 range from 0.768 to 0.901, above the 0.70 benchmark. In addition, all factors loadings reported in Table 2 are above the cut-off point of 0.70, evidencing convergent validity (Nunnally, 1978). To test for discriminant validity, we performed the *chi*-square difference tests on all multi-item constructs in pairs. We collapsed each pair of constructs in a single model and compared its fit with that of a two-construct model (Anderson & Gerbing, 1988). The

Table 3
Descriptive statistics and correlation matrix.

	1	2	3	4	5	6	7	8	9
1. Firm size	1								
2. Firm age	0.451**	1							
3. Technological turbulence	0.021	−0.008	1						
4. Market turbulence	−0.050	0.029	0.283**	1					
5. Competitive intensity	0.160*	0.086	0.327**	0.243**	1				
6. TMT cognitive conflict	−0.009	0.003	0.269**	0.364**	0.178**	1			
7. TMT affective conflict	0.021	−0.024	−0.064	−0.221**	−0.068	−0.321**	1		
8. Market orientation	0.016	0.081	0.286**	0.236**	0.312**	0.563**	−0.517**	1	
9. Exploratory innovation	0.064	0.003	0.339**	0.349**	0.285**	0.477**	−0.383**	0.686**	1
Means	2.98	11.83	3.69	2.94	3.87	3.63	2.29	3.92	3.71
St. D.	1.39	11.40	0.78	0.84	0.67	0.71	0.64	0.50	0.70

* Significant at 5%.
** Significant at 1%.

difference in *chi*-square value is significant in each case, supporting discriminant validity.

As indicated above, we divided the questionnaire into two parts and required two executives from each firm to answer them separately. Our data, thereby, do not suffer from common method bias (Podsakoff et al., 2003). In addition, we performed a Harman's one-factor test on multi-item constructs (TMT cognitive conflict, TMT affective conflict, MO, exploratory innovation, market turbulence, technological turbulence, and competitive intensity). Seven extracted factors account for 70.91% of the total variance, with the first one holding 29.23%. No single factor is apparent. Moreover, we utilized the latent variable approach by loading items on their constructs and on a latent factor and then testing the significance of the constructs with and without the latent factor (Podsakoff et al., 2003). All significant relationships hold when controlling for the latent factor. Thus, common method bias is not a serious concern in this study.

4. Results

Table 3 reports information pertaining to each factor and their correlations. It shows that all correlations are weak except for that between MO and exploratory innovation (0.686). Following the methods of Wang, Law, Hackett, Wang, and Chen (2005), we further test their discriminant validity. If we take MO and exploratory innovation as two variances, the result is NNFI = 0.942, CFI = 0.949, and RMSEA = 0.079. If we merge them together, the result is NNFI = 0.866, CFI = 0.878, and RMSEA = 0.119. The former is much better than the latter. In addition, MO and exploratory innovation are distinct concepts. MO refers to a strategic posture towards thoroughly understanding extant and potential customers and competitors and coordinating resources and activities inter-functionally to create superior customer value continuously (Ketchen Jr. et al., 2007; Narver & Slater, 1990). Exploratory innovation reflects an important type of firm innovation designed to meet the needs of emerging customers or markets (Alexiev et al., 2010; Phelps, 2010). Their meanings are strongly different from each other (a strategic posture as opposed to a type of innovation). Hence, they are taken as separate factors.

We employed regression analysis to test our hypotheses. To check for multicollinearity, we calculated variance inflation factor (VIF) statistics. All VIFs are well below the benchmark of 10, indicating that multicollinearity is unlikely to affect our results (Neter, William, & Kutner, 1985). We report the regression results in Table 4. Model 4 indicates that TMT cognitive conflict has a positive impact on exploratory innovation ($\beta = 0.282$, $p < .001$), yet TMT affective conflict has a negative effect ($\beta = -0.245$, $p < .001$). Thus, both Hypotheses 1 and 2 are supported. Model 5 reports a positive linkage of MO to exploratory innovation, supporting Hypothesis 3. Model 3 tests the role played by TMT conflict in MO. It shows that the impact of TMT cognitive conflict on MO is positive ($\beta = 0.383$, $p < .001$), but that of TMT affective conflict is negative ($\beta = -0.372$, $p < .001$). Hence, both Hypotheses 4 and 5 are supported as well.

Table 4
Regression results.

	Market orientation		Exploratory innovation		
	Model 1	Model 2	Model 3	Model 4	Model 5
Firm size	−0.012	−0.022	0.098	0.091	0.103
Firm age	0.066	0.063	−0.060	−0.061	−0.098
Technological turbulence	0.204**	0.135**	0.222**	0.171**	0.092
Market turbulence	0.119	−0.078	0.260***	0.121*	0.167**
Competitive intensity	0.222**	0.197***	0.145*	0.127*	0.013
TMT cognitive conflict		0.383***		0.282***	0.060
TMT affective conflict		−0.372***		−0.245***	−0.029
Market orientation					0.581***
R-square	0.222	0.518	0.231	0.375	0.538
Adjusted R-square	0.186	0.491	0.195	0.341	0.510
F-value	6.158***	19.429***	6.477***	10.856***	19.466***

Note: To save space, results pertaining to industrial dummies are not reported.
* Significant at 5%.
** Significant at 1%.
*** Significant at 1%.

We utilized the three-step analysis method of Baron and Kenny (1986) to test the mediating impact of MO on the linkage between TMT conflict and exploratory innovation. To establish the mediation, three conditions should hold: first, TMT cognitive and affective conflict significantly affect exploratory innovation in Model 4; second, the effects of both types of conflict on MO are significant in Model 2; third, in Model 5 MO significantly affects exploratory innovation and the effects of TMT cognitive and affective conflict on exploratory innovation are weaker than those in Model 2. Since the effects of both TMT cognitive conflict ($\beta = 0.060$, $p > .10$) and affective conflict ($\beta = -0.029$, $p > .10$) on exploratory innovation are nonsignificant in Model 5, all three conditions hold, supporting the mediating effects of MO. We also used a Sobel test to check the mediating impact of MO (Sobel, 1982). The results confirm these mediating effects. Accordingly, Hypotheses 6 and 7 are supported.

5. Discussion

5.1. Contributions

This study generates three contributions to the literature. First, it enriches our knowledge on the antecedents of exploratory innovation. Due to the value of exploratory innovation, marketing and innovation scholars both call for examining its antecedents (Alexiev et al., 2010; Wang et al., 2014). Drawing on upper echelon theory, they suggest that TMTs play critical role in exploratory innovation. Until now, they have

tested the impact of several TMT-related factors, such as social capital, advice-seeking, leadership, and regulatory foci (Jansen et al., 2009; Li et al., 2014; Su & Yang, 2018; Tuncdogan et al., 2017), but leaving the role of TMT conflicts not yet investigated. This study finds that TMT cognitive conflict has a positive effect on exploratory innovation, but affective conflict has a negative impact, and such effects come true through MO. These findings indicate that TMT conflict and MO both are critical determinants of exploratory innovation and additionally evidence the statement that TMTs have profound effects on exploratory innovation (Jansen et al., 2009; Li et al., 2014). Accordingly, this study improves our understanding on the antecedents of exploratory innovation.

Second, this study advances the scholarly conversation on the relationship of TMT conflict to firm innovation. On the one hand, it contextualizes the role of TMT conflict in an overlooked yet distinct type of innovation – exploratory innovation. While extant studies have examined the effects of TMT conflict on some types of innovation, few have investigated those on exploratory innovation. Given that exploratory innovation differs markedly from other types of innovation in terms of knowledge required to pursue it, some factor may play distinct role in it and other types of innovation (Jansen et al., 2006; Su & Yang, 2018), which makes it inappropriate to apply prior findings into exploratory innovation. Our findings that cognitive conflict in TMTs has a positive effect on exploratory innovation while affective conflict has a negative effect are consistent with prior findings that cognitive conflict serves as a catalyst for firm innovation but affective conflict suppresses it (De Clercq et al., 2009; Qian et al., 2013). While we do not report differences in the effect of TMT conflict on exploratory innovation and on other types of innovation, we extend the implications of TMT conflict into a new type of innovation, which also contributes to drawing a more comprehensive picture on the TMT conflict-innovation linkage.

On the other hand, this study examines the mediating role played by MO in the relationship of TMT conflict to exploratory innovation. Upper echelon theory suggests that TMTs affect firm innovation by influencing strategic decisions (Carpenter et al., 2004; Hambrick, 2007). However, few scholars have attempted to identify these strategic factors (Tuncdogan et al., 2017). We find that MO mediates the linkage between TMT conflict and exploratory innovation, indicating that cognitive conflict nurtures exploratory innovation by encouraging TMTs to make and implement market-oriented decisions; rather, affective conflict has opposite effects and thereby impedes the development of exploratory innovation. The findings illustrate in what manner TMT conflict can influence exploratory innovation from the marketing insight. In summary, by contextualizing the role played by TMT conflict in exploratory innovation and clarifying MO as a conduit by which TMT conflict matters, this study provides new insight in the relationship of TMT conflict to firm innovation and thereby elaborates our knowledge of the innovation implications of TMT conflict.

Finally, this study advances the MO literature. Because of the importance of MO, marketing research calls for more examinations on its antecedents and consequences (Ellis, 2006; Guo et al., 2018; Kirca et al., 2005). This study finds that cognitive conflict in TMTs has a positive effect on MO, while affective conflict has a negative effect. It joins in the stream of MO literature that has examined the effects of several TMT-related factors on MO (Talke et al., 2011). In addition, this study indicates that MO has a positive impact on exploratory innovation, which also enriches our understanding on the implications of MO (Filatotchev et al., 2017). Hence, this study extends our knowledge of both antecedents and consequences of MO.

5.2. Managerial implications

This study has significant practical value also. First, it finds that TMT cognitive conflict has a positive effect on exploratory innovation, while affective conflict has a negative one. Hence, to develop exploratory innovation, all top managers, especially marketing and R&D managers who often disagree with each other, should endeavor to manage and ultimately take advantage of the disagreements. On the one hand, they should openly share relevant knowledge and discuss their perspectives. Although this may cause cognitive conflict in the team, this conflict is beneficial to exploratory innovation. On the other hand, the TMT needs to avoid affective conflict between its members. For example, marketing and R&D managers must keep in mind that affective conflict, which is emotional and arises from personal incompatibilities or disputes, is harmful. Moreover, other managers should coordinate their relationships to avoid affective conflict.

Second, this study indicates that MO is a conduit by which TMT conflict affects exploratory innovation. Therefore, to effectively leverage its conflict to foster exploratory innovation, a TMT should pay attention to MO also. In particular, MO makes it easier to identify and take advantage of opportunities to pursue exploratory innovation. Thus, top managers can benefit their firms by thoroughly understanding current and potential customers and competitors and inter-functionally coordinating resources and activities to create customer value. By such ways, they can formulate a market-oriented strategic posture in the firm. In addition, this study reports that TMT cognitive conflict has a positive effect on MO while affective conflict is detrimental. Hence, top managers should effectively exploit conflict in their team to foster a market-oriented strategy. In particular, they can use cognitive conflict in the team to breed MO and avoid the negative effect of affective conflict on MO by reducing its generation.

5.3. Limitations and future directions

This study is subject to several limitations. First, given that the data used are cross-sectional, the empirical findings are not suited to establish causality. Hence, longitudinal data are needed in further research. Second, while this study has avoided context-specific justifications to ensure the generalizability of its findings, it is empirically based only on Chinese data. Whether the findings can be generalized into other economies is unclear. Future studies should duplicate this research in other countries to ensure the generalizability of these findings. Third, while there is little trace of common method bias, its effect cannot be completely ruled out. It will add credibility to future studies if scholars use objective data to measure the variables and test the model.

This study offers four suggestions to future research. First, other TMT-related factors should be tested to shed additional light on the linkage of TMTs to exploratory innovation and to expand our knowledge on the antecedents of exploratory innovation. Second, this study investigates only MO as a mediator. Future research should seek to identify other strategic factors that might serve as potential mediators to figure out how TMT conflict matters. Third, TMT conflict often occurs between top managers, in particular those in charge of marketing and R&D. Therefore, to inform TMTs how best to take advantage of such conflict, researchers should be extended to account for strategic decisions and outcomes beyond those related to exploratory innovation. Finally, MO is reported as a conduit by which TMT conflict affects exploratory innovation. While extant studies have evidenced the value of MO, new studies are needed to further demonstrate its implications.

6. Conclusion

This study explores the linkage of TMT conflict to exploratory innovation and the mediating impact of MO on the linkage. It finds that TMT cognitive conflict positively affects exploratory innovation, but affective conflict has a negative effect. Moreover, MO is a key conduit by which TMT conflict plays its role in exploratory innovation. These findings advance our knowledge on the antecedents of exploratory innovation, improve our understanding about the linkage of TMT conflict to innovation, and identify additional antecedents and consequences for MO.

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