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ARTICLE

How Surface-Level and Deep-Level Faultlines Influence Team Performance through Subgroup Formation and Team Interaction Quality: A Meta-analytic Review

Yue Zhang[1] and Hui Chen[2]

[1]School of Public Policy and Administration, Northwestern Polytechnical University, Xi'an, China and [2]Ginling College, Nanjing Normal University, Nanjing, China
Corresponding author: Yue Zhang (zhangyue1218@nwpu.edu.cn)

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Abstract
This article develops a framework to test how surface-level and deep-level faultlines impact team performance through subgroup formation and team interaction quality. We test it with 96 empirical articles on team faultlines from 2002 to 2022, using meta-analytic techniques. Firstly, results suggest that subgroup formation and team interaction quality act as serial mediums through which surface-level and deep-level faultlines exert negative indirect effects on team performance. Secondly, moderator analyses reveal that increasing interaction time will mitigate the effects of surface-level faultlines but enhance the effects of deep-level faultlines. Finally, surface- and deep-level social faultlines and deep-level task faultlines are detrimental to team interaction quality, and these negative effects are mediated by subgroup formation. Surface-level task faultlines are beneficial to team interaction, and this positive effect does not work through subgroup formation.

摘要
本文构建了一个理论框架来验证表层与深层的团队断裂线是如何通过子团队的形成和团队成员交往的质量来影响团 队绩效的。我们运用元分析的方法，对 2002 年至 2022 年间发表的 96 篇关于团队断裂线的实证论文的结果进行了分析检验。结果表明，子团队的形成和团队成员的互动质量是解释为什么表层与深层的团队断裂线对团队绩效产生间接负面影响的两个中　介机制。此外，我们发现，随着成员相互作用时间的增加，团队表层断裂线的影响变弱，但团队深层断裂线的影响加强。最后，团队表层和深层的社会属性断裂线、和团队深层的任务属性断裂线，都对团队成员互动质量产生负面影响，并且这些负面影响是通过子团队形成来作用的。有趣的是，团队表层的任务属性断裂线有利于团队成员的互动，但这一积极效应不是通过子团队形成发生的。

Keywords: deep-level faultlines; meta-analysis; surface-level faultlines; time
关键词: 表层团队断裂; 深层团队断裂; 时间; 元分析

Introduction

Given the popularity of faultlines and their ability to explain more complex team dynamics than team diversity (Mathieu, Maynard, Rapp, & Gilson, 2008), scholars have explored the effects of faultlines (e.g., Bezrukova, Jehn, Zanutto, & Thatcher, 2009). The influences of dormant faultlines on team outcomes remain unclear despite the vast amount of faultline research that has been conducted. While a meta-analytic study found a general 'bad' effect of faultlines on team outcomes (Thatcher & Patel, 2012), some studies reported 'good' effects of faultlines (Li, Zhang, & Wei, 2018; Ma, Xiao, Guo, Tang, & Singh, 2022). The faultline literature is rife with conflicting findings and provides managers and researchers with ambiguous guidance. We believe that the oversimplification of team faultlines is one of the leading causes of the inconsistency. We argue that making a general conclusion about the impact of different faultlines is a flawed strategy and that the study should be directed by a more nuanced understanding of the faultline itself. We need to clarify how different faultlines affect team

outcomes in different ways. The answers to this question are crucial since they could expand our knowledge on how to manage diverse teams according to faultline types.

Thatcher and Patel (2012) have provided a promising typology of faultlines. They argued that faultlines may evolve as time goes on because team members initially judge each others' differences based on surface-level attributes but become aware of deep-level attributes in the long term. In light of this, in Study 1, we distinguish between surface-level faultlines and deep-level faultlines in our meta-analysis and develop a contingency framework to test the temporally contingent effects of surface-level and deep-level faultlines on subgroup formation, team interaction quality, and team performance. Furthermore, researchers have argued that social faultlines are expected to be harmful, whereas task faultlines are expected to be beneficial to teams (e.g., Bezrukova et al., 2009). Therefore, in Study 2, we subdivided surface-level and deep-level faultlines into four categories (e.g., surface-level social faultlines, surface-level task faultlines, deep-level social faultlines, and deep-level task faultlines) and examined how four types of faultlines will impact social and task interaction quality. Meta-analysis is particularly suited to deal with these questions as it can include a large amount of the faultline literature that allows testing and comparing the effects of various faultlines.

Another debate in the faultline literature is whether dormant faultlines can directly influence team outcomes without being activated into subgroups. Jehn and Bezrukova (2010) suggested that dormant faultlines do not necessarily shape team interactions and performance; instead, dormant faultlines will be transformed into actual separate subgroups and shape the team interaction processes only when they are activated. However, empirical studies have found that dormant faultlines can impact team outcomes even when they are not activated into subgroups (e.g., Chrobot-Mason, Ruderman, Weber, & Ernst, 2009). Thatcher and Patel's (2012) meta-analytical review has compared the effects of dormant faultlines and activated faultlines (i.e., perceived subgroup formation) and found that the effects of activated faultlines (i.e., perceived subgroup formation) are stronger than dormant faultlines. But their meta-analysis did not further test the linkage between dormant faultlines and perceived subgroup formation. Accordingly, this meta-analysis aims at addressing this gap by developing a serial mediation framework and exploring how the initial dormant faultlines trigger the subgroup formation and then influence team interaction quality and team performance.

We seek to solve the above debates and extend the faultline literature in several ways. First, our meta-analysis contributes to the faultline literature by distinguishing between different types of faultlines. Study 1 found that surface-level and deep-level faultlines exert differentiated effects over time. In Study 2, we further tested the differentiated effects of social and task forms of surface-level and deep-level faultlines on team interaction quality. The distinguishing of faultline types extended our knowledge of the 'good' and 'bad' sides of faultlines, thus contributing to solving the first debate.

Second, by proposing and testing a framework to bridge dormant faultlines and perceived subgroup formation, this meta-analysis provides a deeper understanding of team interaction caused by faultlines. Study 1 found that both surface-level faultlines and deep-level faultlines rely on the perceived subgroup formation and interaction quality to exert a negative influence on team performance. Study 2 further clarified that only the harmful effects of dormant faultlines (i.e., surface-level social faultlines, deep-level social, and task faultlines) work through subgroup formation. In contrast, the beneficial effects of surface-level task faultlines do not rely on the perception of subgroup formation. These findings solve the second debate.

Theoretical Background

Comparison Between Dormant Faultlines and Subgroup Formation

It is important to note that in this research, we do not assume that dormant faultlines necessarily produce corresponding subgroups. We illustrate the difference between dormant faultlines and perceived subgroups. (1) Dormant faultlines are defined as 'hypothetical dividing lines that may (or may not) split a group into subgroups' (Lau & Murnighan, 1998: 328). Thus, the existence of dormant faultlines implicates compositional splits in teams. (2) Subgroups form when team members perceive faultlines as the actual division into several subgroups (Jehn & Bezrukova, 2010). And these subgroups are

'internally homogeneous and externally heterogeneous' (Yu, Deng, Gao, & Liu, 2022: 13). Thus, there is a conceptual distinction between dormant faultlines and subgroup formation.

Taxonomy of Dormant Faultlines

To understand the differentiated influences of faultlines, we classified faultlines into surface-level and deep-level faultlines, which are theoretically driven and consistent with previous diversity taxonomies (Harrison, Price, & Bell, 1998). It is critical to measure the effect sizes of surface-level faultlines and deep-level faultlines and compare their temporally contingent effects.

Surface-level faultlines

Surface-level faultlines are 'hypothetical dividing lines' among team members based on readily detectable characteristics (Ren, Gray, & Harrison, 2015). Such characteristics include age, sex, race/ethnicity, education and functional background, and tenure (Harrison et al., 1998). This meta-analysis categorizes faultlines formed around these characteristics into surface-level faultlines. Further, we distinguish between surface-level social and task faultlines. Surface-level social faultlines are surface-level faultlines based on members' alignment on social category demographics, such as gender, age, race, and nationality (Bezrukova et al., 2009). In contrast, surface-level task faultlines are surface-level faultlines based on characteristics that are directly related to work tasks, such as work experiences and educational backgrounds (Bezrukova et al., 2009) (see Table 1).

Deep-level faultlines

Deep-level faultlines are defined as 'hypothetical dividing lines' among team members forming from underlying personality traits, beliefs, and norms (Ren et al., 2015). Such characteristics include personality, values, attitudes, and decision-making styles that are only learned through extended interaction and information exchange because they unfold as interaction time increases (Harrison, Gavin, & Florey, 2002). We categorize faultlines formed around these characteristics into deep-level faultlines. We realize that surface-level faultlines and deep-level faultlines are distinct theoretical constructs and may have different effects over time. In addition, we distinguish between deep-level social and task faultlines. Deep-level social faultlines are based on members' alignment on social psychology characteristics, such as relationship values, personalities, attitudes, and cultural orientations. In contrast, deep-level task faultlines are based on unobservable cognitive features related to team tasks, such as decision-making style faultlines, goal commitment, and task meaningfulness (see Table 1).

The Present Research

Two meta-analyses were designed to examine the differentiated impacts of surface-level faultlines and deep-level faultlines. Study 1 examines the indirect effects of surface-level faultlines and deep-level faultlines on team performance through subgroup formation and team interaction quality and tests how the effects of surface-level and deep-level faultlines differentiate over time.

Study 2 mainly focuses on faultlines' effects on team interaction quality. Meta-analysis is conducted, and it aims to further examine how surface-level social faultlines, surface-level task faultlines, deep-level social faultlines, and deep-level task faultlines will impact social and task interaction quality, respectively.

Study 1

Hypotheses

Dormant faultlines and subgroup formation

Subgroups are likely characterized by team composition, such as dormant faultlines (Lau & Murnighan, 1998). The dormant faultlines are important predictors of subgroup formation. When strong surface-level faultlines exist, there are salient boundaries between team members with dissimilar

Table 1. The labels of variables

Variables	Description	Examples
Surface-level faultlines	Faultlines based on observable features.	**Surface-level social faultlines** (based on social category attributes): i.e., Faultlines based on gender, age, race/ethnicity, and nationality **Surface-level task faultlines** (based on observable task-related attributes): i.e., Faultlines based on level of education, functional background, tenure, career experience, business unit, and reporting channel **Other surface-level faultlines** (based on hybrid observable attributes of social category and task-related backgrounds, or other observable attributes) i.e., Faultlines based on gender, age, and educational background; Faultlines based on location
Deep-level faultlines	Faultlines based on unobservable features.	**Deep-level social faultlines** (based on social psychology): i.e., Faultlines based on relationship values, personality, attitudes, and cultural orientation **Deep-level task faultlines** (based on unobservable cognitive features related to team tasks): i.e., Faultlines based on decision-making style faultlines, goal commitment, and task meaningfulness **Other deep-level faultlines** (based on hybrid attributes of social psychology and task-related cognition, or other unobservable attributes): i.e., Faultlines based on family membership and type of directorship; Faultlines based on perceived power.
Subgroup formation	Team members fall into 'subsets that are each characterized by a unique form of interdependence'.	Perceived subgroup formation; Perceived/activated faultlines; Perceived coalition formation
Team interaction quality	Team members' perception of the status of the interaction processes.	**Team social interaction quality** i.e., Team relationship conflict (inversed term); Team trust; Team identification; Team relational harmony; Team cohesion; Team social learning; Team social/affective integration; Team cooperation reciprocity **Team task interaction quality** i.e., Team task conflict (inversed term); Knowledge hiding (inversed term); Team task learning; Team cognitive integration; Team information sharing/elaboration; Team communication **Other team interaction quality** i.e., Team process conflict (inversed term); Team power struggling (inversed term)
Team performance	The quantity and quality of team outputs.	Final scores; Productivity; Profitability; Perceived team performance rated by supervisors or team members

attributes. According to social categorization theory (SCT, Turner, Sachdev, & Hogg, 1983), team members are likely to be categorized into similar 'in-group' and dissimilar 'out-groups' on the basis of salient surface-level characteristics (Cooper, Patel, & Thatcher, 2014). People tend to come in contact more with similar (in-group) members than that with dissimilar (out-group) others (Brewer & Brown, 1998). In this case, network ties tend to be built among members with similar surface-level characteristics (McPherson, Smith-Lovin, & Cook, 2001). Thus, similar team members are aggregated into dense subgroups, and there are more mutual interactions among members in a homogeneous subgroup than those between different subgroups, increasing the likelihood of subgroup formation.

Hypothesis 1a (H1a): There will be a positive relationship between surface-level faultlines and subgroup formation.

The attraction-selection-attrition model (Schneider, Goldstiein, & Smith, 1995) has been used to explain how deep-level faultlines based on unobservable characteristics will trigger subgroup formation. They suggest that people prefer interacting with those who are similar in psychological traits (e.g., values, attitudes, beliefs, and personality) or cognitive features (e.g., decision-making style, task goal commitment, and task meaningfulness). The reason is that these features verify and reinforce their own expressed behaviors (e.g., Swann, Stein-Seroussi, & Giesler, 1992). Accordingly, when strong deep-level faultlines separate team members into different categories, team members will be attracted to develop interpersonal interactions with members who have similar psychological characteristics or cognitive features, rather than those in other categories. Therefore, team members tend to categorize themselves into subgroups according to deep-level faultlines.

Hypothesis 1b (H1b): There will be a positive relationship between deep-level faultlines and subgroup formation.

Further, we proposed that deep-level faultlines were expected to be more influential than surface-level faultlines in forming subgroups. First, more accurate and straightforward implications about others can be inferred from deep-level characteristics (Larson, 2007). For instance, understanding deep-level characteristics have been found to be more influential in attraction, make interpersonal interaction more rewarding, and reduce role ambiguity (Van Emmerik & Brenninkmeijer, 2009). Previous studies also confirmed that deep-level characteristics have more influential effects on team interaction than surface-level characteristics (Larson, 2007). Second, Phillips, Northcraft, and Neale (2006) suggested that learning deep-level characteristics would erode the legitimation of surface-level differences. Hence, we argue that faultlines based on deep-level characteristics are more influential in shaping team members' interactions and appear to have more salient and consistent effects on the formation of subgroups than surface-level faultlines.

Hypothesis 1c (H1c): Deep-level faultlines have stronger effects on subgroup formation than surface-level faultlines.

Subgroup formation and team interaction quality

When team members are polarized into opposing subgroups, they tend to dehumanize members of other subgroups and value members in their own subgroups. For example, people from different subgroups are likely to have negative effects on each other (Hornsey & Hogg, 2000). In addition, team members in different subgroups will find it challenging to understand each other and accept one another's ideas (Jiang, Jackson, Shaw, & Chung, 2012). Therefore, the formation of subgroups is likely to decrease the team interaction quality, such as triggering conflict, detracting from mutual trust and respect, and hindering team learning, information elaboration, and integration (Cronin, Bezrukova, Weingart, & Tinsley, 2011). Conceptualizing team interaction quality as the perception of the status of the relational and informational interaction processes among team members (Kirk, Hekman, Chan, & Foo, 2022), it follows that the subgroup formation should undermine the team interaction quality.

Hypothesis 2 (H2): There will be negative relationships between subgroup formation and team interaction quality.

Team interaction quality and team performance

We argue that team interaction quality will promote team performance. High quality of team interaction indicates beneficial interaction among team members. For example, when team members develop integrated and coherent interaction with each other, they may feel a sense of psychological safety and focus on reaching the team goals (Li & Hambrick, 2005), which will improve group performance (Vora & Markóczy, 2012). In addition, when team members benefit from information elaboration, task learning, and knowledge transfer, they will discuss task-oriented issues and generate new ideas to perform better (Vora & Markóczy, 2012). Consequently, we offer the following hypothesis:

Hypothesis 3 (H3): Team interaction quality has a positive relationship with team performance.

The mediation role played by subgroup formation and team interaction quality

We have argued that surface-level and deep-level faultlines among team members may contribute to subgroup formation. Next, the formation of subgroups will decrease the interaction quality. As established previously, the interaction quality will, in turn, act on team performance. Drawing on the arguments above, we suggest that dormant faultlines may not contribute to team performance alone. Instead, dormant faultlines' effects on team performance rely on subgroup formation and team interaction quality. Altogether, our logic suggests the mediated hypotheses:

Hypothesis 4 (H4): Subgroup formation will mediate the negative effects of surface-level faultlines (a) and deep-level faultlines (b) on team interaction quality.

Hypothesis 5 (H5): Team interaction quality will mediate the negative effect of subgroup formation on team performance.

Hypothesis 6 (H6): Subgroup formation and team interaction quality will mediate the negative effects of surface-level faultlines (a) and deep-level faultlines (b) on team performance in sequence.

How interaction time matters in network formation

In the previous discussion, we emphasized the importance of dormant faultlines in producing subgroup formation, interaction quality, and performance. We postulated that surface-level and deep-level dormant faultlines work in similar ways. However, team networks are dynamic and never staid as time passes (Marsden, 1990). Drawn from the perspective of social categorization theory (SCT, Turner et al., 1983), faultlines' impacts are contingent on categorization salience (Van Knippenberg, De Dreu, & Homan, 2004), which is varying over time. Interaction time allows personal emotions and information to be exchanged between members, deepening team members' understanding of each other and thus increasing the salience of social categorization. Hence, the present study highlights a critical moderating role for interaction time in research, attempting to unpack the 'black box' of the contingent effects of surface- and deep-level faultlines.

The social categorization perspective supports the notion that there will be an automatic categorization based on surface-level characteristics because surface-level attributes are initially salient and accessible (Harrison et al., 2002). However, if members share only similar surface-level attributes, long interaction time would provide them with more opportunities to learn about each other and discover how little they have in common on unobserved deep-level attributes, reducing the salience of surface-level faultlines (Ziebro & Northcraft, 2009). In this case, team members view surface-level attributes as less meaningful and relevant when developing their real network ties, choosing interaction strategy, and contributing to team performance in the long term. Accordingly, surface-level dormant faultlines should have weaker long-run effects on subgroup formation, team interaction quality, and performance.

Hypothesis 7 (H7): The effects of surface-level faultlines on subgroup formation (a: less positive), team interaction quality (b: less negative), and team performance (c: less negative) will be weakened in the long term.

In contrast, deep-level faultlines form from psychological attributes (Harrison et al., 2002). The salience of deep-level faultlines would increase over time since team members have more chances to learn about their deep-level traits with long-term collaboration, enhancing the cognitive accessibility of deep-level attributes. Accordingly, deep-level faultlines may become a salient determinant for team interaction and team performance under long-term interaction. Hence, the time effect would exacerbate the influence of deep-level faultlines.

Hypothesis 8 (H8): The effects of deep-level faultlines on subgroup formation (a: more positive), team interaction quality (b: more negative), and team performance (c: more negative) will be strengthened in the long term.

Methods

Sample

Literature search. Several sources were used to locate suitable studies investigating team faultlines and network properties from 2002 to 2022. First, we searched the computerized databases (including the Social Science Citation Index, PsycINFO, ProQuest, Science Direct, and ABI/INFORM) to find published papers and dissertations using the following keyword combinations: team/group, faultlines, subgroup, and performance. In addition, we supplement the database searches with other search strategies, including manual checks of the references of previous team faultline meta-analyses (e.g., Meyer, Glenz, Antino, Rico, & González-Romá, 2014; Thatcher & Patel, 2012), and manual searches of articles in top journals (e.g., *Journal of Applied Psychology, Academy of Management Journal, and Journal of Management*). Finally, we searched Google Scholar and contacted researchers in the faultline research field to locate possible unpublished studies. After searching the databases, we initially got 3023 articles.

Study inclusion. After screening for titles and abstracts, we excluded articles that were unrelated, not quantitative studies, and not written in English. Next, we reviewed the remaining 632 full-text articles for eligibility and included studies in this meta-analysis following several criteria. First, we included articles that report sample size, research setting, and appropriate statistics [e.g., correlation coefficient, standard deviation (SD), and reliability coefficient] that are used to compute the effect sizes of the relationships between faultlines, subgroup formation, team interaction, and team performance. Although for TMTs, the performance was measured at the firm-level, we retained these TMT samples. The reason is that firm-level performance is typically reflected by the function of the TMT. Thus, we can generate the effect sizes at the team-level. Second, articles had to contain faultlines based on surface-level or deep-level attributes. Third, since this research was interested in identifying interaction time as a moderator influencing faultline outcomes, studies were required to provide information about team status (continuous or temporary). Finally, we checked for sample overlaps between articles written by the same author(s). Based on the inclusion criteria, 63 articles were excluded as they were not quantitative studies, 350 articles were excluded as they were not related to our focused relationships, 75 articles were excluded due to insufficient data, 42 articles were excluded due to duplication, and 7 articles testing faultlines' effects at the individual- or the organizational-level were excluded (see Figure 1). Finally, 96 studies in 95 articles were included in this meta-analysis.

Coding

All studies were coded by two authors. We developed a formal coding scheme regarding the different variable categorizations. Next, both coders who are familiar with the faultline and network literature independently coded articles. The high inter-rater reliability coefficients (0.85 to 0.97) suggested a reliable coding process.

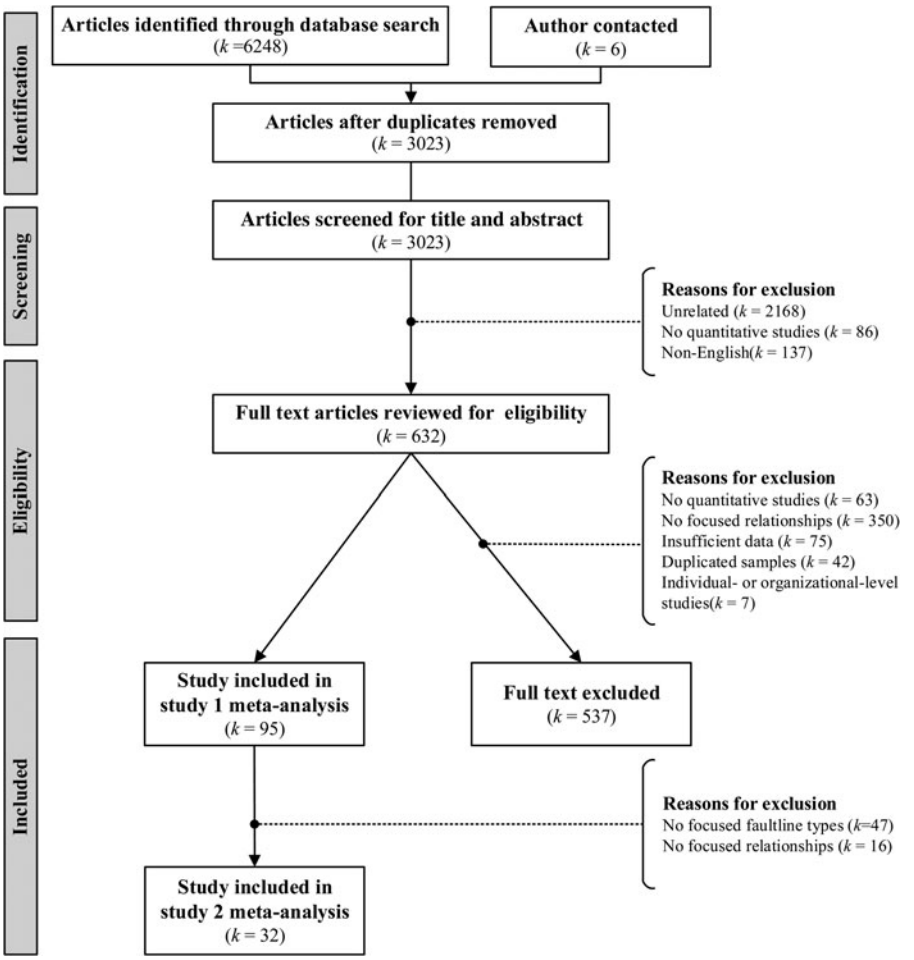

Figure 1. Flowchart depicting the systematic review process including reasons for exclusion

Measures

Team dormant faultlines. Drawing on past research (e.g., Harrison et al., 1998), we classified team dormant faultlines into surface-level and deep-level faultlines. Surface-level faultlines focused on the alignment of observable attributes such as age, gender, race, educational background, functional background, and tenure. We labeled dormant faultlines as deep-level faultlines if the faultlines are based on unobservable attributes. All these kinds of dormant faultlines were measured by objective approaches. The objective approach to measuring faultlines included in this meta-analysis includes Fau index, FLS (Faultline strength)-Index, Subgroup Strength, Factional Faultlines, and ASW (Average silhouette width, Gibson & Vermeulen, 2003; Li & Hambrick, 2005; Meyer & Glenz, 2013; Shaw, 2004; Thatcher, Jehn, & Zanutto, 2003). These indexes provide the measurement of faultline strength.

Subgroup formation. Subgroups are 'subsets of team members that are each characterized by a unique form or degree of interdependence' (Carton & Cummings, 2012: 732). Wasserman and Faust (1994) described the subgroups as a set of actors that were relatively dense and directly connected through reciprocated relationships. And the formation of subgroups within a team indicates frequent interaction within a subgroup and less interaction between the subgroups. As shown in Table 1, we set subgroup formation as an umbrella term of various comparable variables in faultline research, such as perceived subgroup formation (interaction pattern: members will develop actual constructive

interactions within subgroups while they perceive a competitive divide between subgroups), coalition formation (interaction pattern: members' behaviors within a coalition involve more closed interactions than those with other parts of the group), and perceived/activated faultlines (interaction pattern: when the faultlines are activated, team members are attracted by similar ones and build more cohesive bounds among subgroup members who share the same attributes). These variables are all comparable to the definition of subgroup formation because they indicate a team interaction structure, such that some team members are aggregated into several dense subgroups, and there are more intense mutual relations among members within the subgroup than those between the subgroups. All variables are measured subjectively through ratings by individuals.

Team interaction quality. Team interaction quality refers to the perceptions of the status of the interaction processes among team members (Kirk et al., 2022). Cooke and Szumal (1994) demonstrated that constructive team interactions are superior in quality, while passive and aggressive interactions are inferior in quality. The constructive interaction quality is characterized by cooperation, trust, integration, and cohesion that fulfill affiliation needs as well as information exchange and team learning that fulfill problem-solving needs.

The construct of team interaction quality thereby subsumes team members' perceptions of constructive team interactions, such as team integration, identification, cohesion, relational harmony, cooperation reciprocity, and mutual trust experienced by team members as well as the amount of learning, information sharing and elaboration, communication, and coordination within a team. In addition, high team interaction quality also indicates that a team experience less passive (e.g., hiding information) and aggressive interaction (e.g., conflict and contest) (Potter & Balthazard, 2002). Therefore, we also included the inverse terms of knowledge hiding, team conflict, and power struggle as variables of team interaction quality. All the variables of team interaction quality are measured subjectively through ratings by team members.

Team performance. We define team performance as the quantity and quality of team outputs (Schneid, Isidor, Li, & Kabst, 2015). Team performance was measured as team awards/bonuses, final scores/grades, productivity, profitability, and perceived team performance rated by supervisors or team members (see Table 1). Notably, we did not distinguish between objective and subjective team performance because we found no significant difference in relationships between faultlines and either type of team performance.[1] When team performance was measured in multiple approaches, we included objective measures (Joshi & Roh, 2009).

Interaction time. We coded interaction time according to the expected length of time that a team exists (Joshi & Roh, 2009). We classified interaction time into short-term and long-term. Student teams taking part in courses and temporal project teams existing for less than one year were classified as short-term teams. Teams existing for longer than one year were considered as long-term (The average team tenure > 1 year).

Meta-analytic techniques

First, to test the hypotheses of bivariate relationships (i.e., Hypotheses 1–3), we used Schmidt and Hunter's (2015) meta-analytic approaches to synthesize correlation coefficients across the studies. We created the weighted mean correlation adjusted for measurement error ($\bar{\rho}$).

Second, to test the mediation effects of subgroup formation and team interaction quality (i.e., Hypotheses 4–6), we adopted meta-analytic structural equation modeling (MASEM; Cheung, 2015). In contrast to traditional bivariate meta-analysis, MASEM provides 'unique statistical power advantages' (Bergh et al., 2016: 478). We chose the random effects approach rather than the fixed effects model to calculate effect sizes because of its conservation (Geyskens, Krishnan, Steenkamp, & Cunha, 2009). When testing the mediation hypotheses, we followed methods developed by Cheung (2022) to calculate the indirect effects of the structural model.

Third, we conducted detailed moderation analyses to explore whether interaction time would contribute to the heterogeneity of effect sizes. Following Drees and Heugens (2013), the moderator

analysis was conducted independently from MASEM. The moderator effects of interaction time were tested on the correlation coefficients between each pair of variables but not on specific parameters in a structural equation model. It is because we are interested in how the general effects of surface-level and deep-level faultlines on subgroup formation, team interaction quality, and team performance will evolve over time, respectively. We adopted ANOVA to compare the effect sizes of two categories of interaction time (i.e., short-term and long-term) (Lipsey & Wilson, 2001). A significant Q_B indicates that the interaction time is a significant moderator and explains the heterogeneity between subgroups (Aguinis, Gottfredson, & Wright, 2011).

Results

Study characteristics

As shown in Appendix I, the 95 articles covered a period from 2002 to 2022, including 63 journal articles, 19 dissertations, 12 conference papers, and one research report. The sample size ranged from 11 to 424.

Publication bias

Following Van Dijk, Van Engen, and Van Knippenberg (2012), we tested the between-subgroup differences among the effect sizes of unpublished studies, dissertations, and published papers. The result in Table 2 suggested that there was no publication bias. In addition, we conducted Egger's regression analysis, and the statistics also confirmed no publication bias (see Table 2).

Relationships among faultlines, subgroup formations, team interaction quality, and team performance

Table 3 summarizes the results of the bivariate correlations between each pair of variables. As shown in Table 3, both surface-level faultlines ($\bar{\rho} = 0.134$; *95% CI* [0.040, 0.228]) and deep-level faultlines ($\bar{\rho} = 0.489$; *95% CI* [0.151, 0.827], $k = 3$)[2] have significant and positive relationships with subgroup formation, thus supporting Hypothesis 1a and Hypothesis 1b. In addition, compared with surface-level faultlines, deep-level faultlines have a more positive effect on network subgroup formation ($Q_B = 14.51$, $p < 0.001$), supporting Hypothesis 1c. For Hypothesis 2, we observed a significant and negative relationship between subgroup formation and team interaction quality ($\bar{\rho} = -0.321$; *95% CI* [−0.497, −0.245]). Thus, Hypothesis 2 is supported. For Hypothesis 3, we observed that team interaction quality was significantly and positively related to team performance ($\bar{\rho} = 0.334$; *95% CI* [0.261, 0.409]). Thus, Hypothesis 3 is supported.

The mediating effects

We conducted MASEM to test the mediation hypotheses (i.e., Hypotheses 4–6). Table 4 provides the meta-analytic correlation matrix. The lower left of the off-diagonal entries provides the weighted mean effect size corrected for measurement error. The upper right of the off-diagonal entries presents the number of studies (k) and the total sample sizes (N) in parentheses.

To test the mediation effects, we followed the procedures developed by Cheung (2022) to calculate the indirect effects. Table 5 shows the results of the direct and indirect effects. First, the result of the partial mediation model in Table 5 illustrates that surface-level faultlines have a significant and negative indirect effect on team interaction quality through subgroup formation (Mediator 1) (*Indirect effect* = −0.055, *95% CI* [−0.371, −0.015]). Meanwhile, the direct effect of surface-level faultlines on team interaction quality becomes insignificant (*Direct effect* = 0.042, $p = 0.253$). Therefore, subgroup formation fully mediates the negative relationship between surface-level faultlines and interaction quality, supporting Hypothesis 4a. Similarly, deep-level faultlines also have a significant and negative indirect effect on team interaction quality through subgroup formation (Mediator 1) (*Indirect effect* = −0.174, *95% CI* [−0.208, −0.062]). Meanwhile, the direct effect of deep-level faultlines on team interaction quality becomes insignificant (*Direct effect* = 0.078, $p = 0.510$). Therefore, subgroup formation fully mediates the negative relationship between

Table 2. Publication bias

Correlations	Difference among published journal, dissertation, unpublished article	Egger's test		
	Q_B	p	Bias Coef	p
$\bar{\rho}_{\text{Surface-level faultlines} \rightarrow \text{Deep-level faultlines}}$	0.054	0.817	−0.873	0.532
$\bar{\rho}_{\text{Surface-level faultlines} \rightarrow \text{Subgroup formation}}$	0.775	0.679	0.294	0.721
$\bar{\rho}_{\text{Surface-level faultlines} \rightarrow \text{Team interaction quality}}$	5.559	0.062	1.655	0.053
$\bar{\rho}_{\text{Surface-level faultlines} \rightarrow \text{Team performance}}$	0.324	0.851	−0.821	0.138
$\bar{\rho}_{\text{Deep-level faultlines} \rightarrow \text{Subgroup formation}}$	/	/	/	/
$\bar{\rho}_{\text{Deep-level faultlines} \rightarrow \text{Team interaction quality}}$	1.429	0.232	−2.049	0.372
$\bar{\rho}_{\text{Deep-level faultlines} \rightarrow \text{Team performance}}$	0.006	0.941		
$\bar{\rho}_{\text{Subgroup formation} \rightarrow \text{Team interaction quality}}$	2.352	0.125	−2.179	0.020
$\bar{\rho}_{\text{Subgroup formation} \rightarrow \text{Team performance}}$	2.676	0.262	0.069	0.343
$\bar{\rho}_{\text{Team interaction quality} \rightarrow \text{Team performance}}$	0.898	0.054	−1.508	0.202

Table 3. Meta-analytic correlations

	k	N	$\bar{r}$	SD_r	$\bar{\rho}$	SD_ρ	*95% CI*
Surface-level faultlines → Deep-level faultlines	4	295	−0.054	0.042	−0.054	0.042	[−0.168, 0.059]
Surface-level faultlines → Subgroup formation	12	785	0.120**	0.138	0.134**	0.149	[0.040, 0.228]
Surface-level faultlines → Team interaction quality	49	2938	−0.020	0.191	−0.022	0.209	[−0.084, 0.039]
Surface-level faultlines → Team performance	47	4834	−0.028	0.149	−0.030	0.158	[−0.080, 0.020]
Deep-level faultlines → Subgroup formation	3	176	0.484*	0.304	0.489**	0.305	[0.151, 0.827]
Deep-level faultlines → Team interaction quality	11	793	−0.087	0.187	−0.097	0.204	[−0.223, 0.030]
Deep-level faultlines → Team performance	11	858	0.011	0.196	0.013	0.207	[−0.120, 0.145]
Subgroup formation → Team interaction quality	25	1467	−0.273***	0.164	−0.321***	0.191	[−0.497, −0.245]
Subgroup formation → Team performance	12	761	−0.190***	0.209	−0.199*	0.191	[−0.042, −2.482]
Team interaction quality → Team performance	38	2464	0.291***	0.190	0.334***	0.221	[0.261, 0.409]

Notes: k = total number of effect sizes; N = total sample size; $\bar{r}$ = sample-size-weighted mean observed correlations; SDr = standard deviation of observed correlations; $\bar{\rho}$ = estimate of weighted mean correlation adjusted for measurement error; SDρ = standard deviation of $\bar{\rho}$; 95% CI = 95% confidence interval around $\bar{\rho}$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

deep-level faultlines and interaction quality, and Hypothesis 4b is also supported. We also found that team interaction quality (Mediator 2) fully mediates the negative relationship between subgroup formation (Mediator 1) and performance (*Direct effect* = −0.168, $p = 0.203$, *Indirect effect* = −0.103, *95% CI* [−0.164, −0.062]), which supports Hypothesis 5. Finally, we tested the two serial mediation effects. We found that subgroup formation (Mediator 1) and team interaction quality (Mediator 2) will fully mediate the negative effects of surface-level faultlines (*Direct effect* =

Table 4. Meta-analytic correlation matrix

Variables	1	2	3	4	5
1. Surface-level Faultlines	1	4 (295)	12 (785)	49 (2938)	47 (4834)
2. Deep-level Faultlines	−0.054	1	3 (176)	11 (793)	11 (858)
3. Subgroup Formation	0.134**	0.489**	1	25 (1467)	12 (761)
4. Interaction Quality	−0.022	−0.097	−0.321***	1	38 (2464)
5. Team Performance	−0.030	0.013	−0.199*	0.334***	1

Notes: Off-diagonal entries on the lower left contain the reliability corrected and weighted mean effect size. Off-diagonal entries in the upper right present the number of studies *k* and total sample sizes (*N*) in parentheses. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Table 5. Direct and indirect effects and fit Indices of different structural model

Path	Partial mediation model	Full mediation model
Direct effect		
Surface-level faultlines → Subgroup formation	0.150**	0.129**
Deep-level faultlines → Subgroup formation	0.478**	0.384**
Subgroup formation → Interaction quality	−0.364***	−0.314***
Interaction quality → Team performance	0.283***	0.328***
Surface-level faultlines → Interaction quality	0.042	
Deep-level faultlines → Interaction quality	0.078	
Subgroup formation → Team performance	−0.168	
Surface-level faultlines → Team performance	0.005	
Deep-level faultlines → Team performance	0.129	
Indirect effect		
Surface-level faultlines → Subgroup formation → Interaction quality	−0.055 [−0.371−0.015]	−0.041 [−0.071−0.010]
Deep-level faultlines → Subgroup formation → Interaction quality	−0.174 [−0.208−0.062]	−0.121 [−0.208−0.021]
Subgroup formation → Interaction quality → Team performance	−0.103 [−0.164−0.062]	−0.103 [−0.140−0.072]
Surface-level faultlines → Subgroup formation → Interaction quality → Team performance	−0.015 [−0.067−0.010]	−0.013 [−0.023−0.003]
Deep-level faultlines → Subgroup formation → Interaction quality → Team performance	−0.049 [−0.107−0.001]	−0.040 [−0.072−0.007]
Model fit	$\chi^2(1) = 0.893$	$\chi^2(6) = 5.066$

Notes: Standardized coefficients are reported; 95% confidence interval around the indirect effects are present in brackets; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

0.005, $p = 0.886$, *Indirect effect* = −0.015, *95% CI* [−0.067, −0.010]) and deep-level faultlines (*Direct effect* = 0.129, $p = 0.236$, *Indirect effect* = −0.049, *95% CI* [−0.107, −0.001]) on team performance in sequence. Thus, Hypothesis 6a and 6b are supported. Figure 2 presents the standardized path coefficients of the MASEM.

Chung, Zhan, Noe, and Jiang (2022) suggested comparing alternative structural models using meta-analytic data. The results of the initial model indicate full mediation paths from surface-level and deep-level faultlines on team performance. Thus, we developed a full mediation model as an alternative model. We removed the direct paths from both surface-level and deep-level faultlines to team

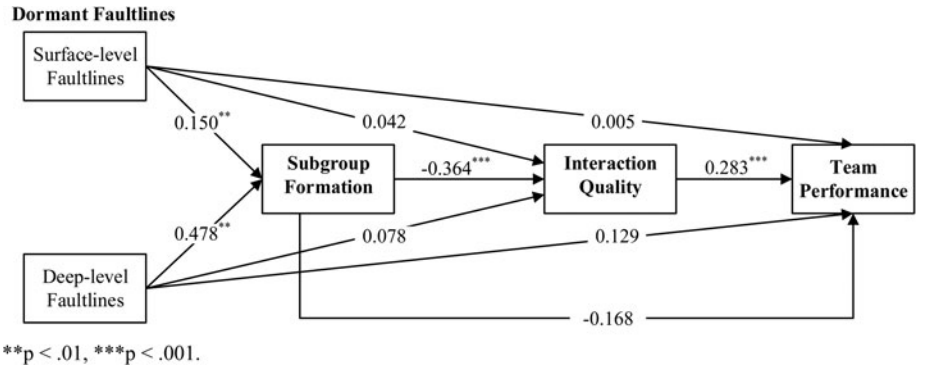

Figure 2. Results of meta-analytical structural equation modeling.

interaction quality and team performance, and we found that the full mediation model fits better than the initial partial mediation model (χ^2 [6] = 5.066, $\Delta\chi^2$ [5] = 4.173, $p < 0.05$). Therefore, the full mediation effects were further confirmed.

The moderating effects of interaction time

Hypothesis 7 and 8 predicted that the impacts of surface-level faultlines and deep-level faultlines were moderated by the interaction time. Table 6 summarizes the results. Surface-level faultlines show a less positive effect on subgroup formation in long interaction time ($\bar{\rho} = 0.083$, $p > 0.05$) than in short-term ($\bar{\rho} = 0.254$, $p < 0.01$), and the moderating effect of interaction time is significant ($Q_B = 4.267$, $p < 0.05$). Thus, Hypothesis 7a is supported. We found that surface-level faultlines have a negative effect on interaction quality in long interaction time ($\bar{\rho} = -0.078$, $p < 0.05$) but a positive effect in the short-term ($\bar{r} = 0.005$, $p > 0.05$), which were not in the hypothesized direction. Thus, Hypothesis 7b is not supported. We found that surface-level faultlines exert a less negative effect on team performance in long interaction time ($\bar{\rho} = -0.004$, $p > 0.05$) than in the short-term ($\bar{\rho} = -0.039$, $p > 0.05$). However, the moderating effect of interaction time is not significant ($Q_B = 1.200$, $p > 0.05$). Thus, Hypothesis 7c is not supported. In sum, the moderation effect of interaction time on the effects of surface-level faultlines is supported for Hypotheses 7a.

Limited by research samples, we are unable to test the moderating effects of interaction time in the link between deep-level faultlines and subgroup formation (H8a). Deep-level faultlines show a more negative effect on team interaction quality in long interaction time ($\bar{\rho} = -0.111$, $p > 0.05$) than in the short-term ($\bar{\rho} = -0.065$, $p < 0.05$). However, the moderating effect of interaction time is not significant ($Q_B = 0.316$, $p > 0.05$). Thus, Hypothesis 8b is not supported. We also found that the effect of deep-level faultlines on team performance is more negative in long interaction time ($\bar{\rho} = -0.130$, $p > 0.05$) than in the short-term ($\bar{\rho} = 0.076$, $p > 0.05$). And the moderating effect of interaction time is significant ($Q_B = 7.55$, $p < 0.01$). Thus, Hypothesis 8c is supported. In sum, the moderation effect of interaction time is only supported for the relationship between deep-level faultlines and team performance (H8c).

Study 2

Previous empirical studies have found that dormant faultlines could influence team outcomes even when they are not activated into subgroups (e.g., Chrobot-Mason et al., 2009). However, Study 1 showed that dormant faultlines work through subgroup formation to negatively impact team interaction quality (see Table 5). And the direct effects of dormant faultlines on team interaction quality were not significant (see Table 3). The inconsistency between previous research's findings and our meta-analysis's results suggests that the direct effects of faultlines on team interaction quality deserve further exploration.

We suppose that the inconsistency could be solved by distinguishing between the social and task forms of faultlines. Researchers have long argued that social faultlines are expected to be harmful,

Table 6. Moderating effects of interaction time

Variable	k	$\bar{\rho}$	Q_B
Surface-level faultlines → Subgroup formation			
Surface-level faultlines × Interaction Time	12		4.267*
Short interaction time	6	0.254**	
Long interaction time	6	0.083	
Deep-level faultlines → Subgroup formation			
Deep-level faultlines × Interaction Time	3		/
Short interaction time	3	0.489**	
Long interaction time	0	/	
Surface-level faultlines → Interaction quality			
Surface-level faultlines × Interaction Time	49		4.744*
Short interaction time	24	0.005	
Long interaction time	25	−0.078*	
Deep-level faultlines → Interaction quality			
Deep-level faultlines × Interaction Time	11		0.316
Short interaction time	7	−0.065	
Long interaction time	4	−0.111	
Surface-level faultlines → Performance			
Surface -level faultlines × Interaction Time	47		1.200
Short interaction time	18	−0.039	
Long interaction time	29	−0.004	
Deep-level faultlines → Performance			
Deep-level faultlines × Interaction Time	11		7.550**
Short interaction time	6	0.076	
Long interaction time	5	−0.130	

Notes: k is the number of effect sizes; $\bar{\rho}$ is the estimate of weighted mean correlation adjusted for measurement error; Q_B is the between-group heterogeneity statistic; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

whereas task faultlines are expected to be beneficial to teams (e.g., Bezrukova et al., 2009). Chen and her colleagues' meta-analysis also confirmed that social faultlines decreased team cognition integration, while task faultlines contributed to team cognition integration (Chen, Liang, & Zhang, 2019b). Therefore, we decided to take a more nuanced view of faultline itself and examine the effects of surface-level social faultlines, surface-level task faultlines, deep-level social faultlines, and deep-level task faultlines on team social and task interaction qualities.

Hypotheses

The effect of surface-level social faultlines on team interaction quality

Surface-level social faultlines are 'hypothetical dividing lines' that divide a group into homogeneous subgroups based on members' alignment on social category attributes, such as gender, age, race, and nationality (Bezrukova et al., 2009). Team members' differences in these characteristics are likely to shape their behaviors through outgroup stereotyping and prejudice, leading to decreased cohesion (Schölmerich, Schermuly, & Deller, 2016) and social integration (Jiang et al., 2012), and increased relationship conflict (Choi & Sy, 2010), thus adversely affect team social interaction quality. Whereas surface-level social faultlines may not be directly relevant to team task interaction, the harmful social

categorization mechanism will likely disrupt the elaboration of task-related knowledge and information (Van Knippenberg et al., 2004). For instance, tension and personal attacks generated from harmful social categorization mechanisms are likely to lead to task conflict (Adair, Liang, & Hideg, 2017) and limit information exchanges and knowledge sharing (Bezrukova et al., 2009) that are necessary for accomplishing team tasks in teams with surface-level social faultlines.

Hypothesis 1 (H1): Surface-level social faultlines have negative effects on social interaction quality (a) and task interaction quality (b).

We propose that surface-level social faultlines provide a salient basis for subgroup formation. The social categorization processes implied by faultline theory suggest that surface-level social categorical characteristics (e.g., gender, age, race/ethnicity) are quite accessible because people use these attributes to socialize in their daily lives. In addition, surface-level social categorical differences are likely to serve as the basis of stereotypes and prejudice in the workplace (Stangor et al., 1992). Thus, surface-level social faultlines have a normative fit. The accessibility and normative fit of surface-level social faultlines provide the basis for subgroup salience, thus contributing to subgroup formation. Once team members perceive the formation of subgroups, the subgroup identity will trigger in-group–out-group biases (Greer & Jehn, 2007), thus inhibiting beneficial social interactions (Cronin et al., 2011) and creating blocks in exchanging task information (Shemla & Wegge, 2019). By extension, we propose that the negative effects of surface-level social faultlines on social and task interaction quality are mediated by subgroup formation.

Hypothesis 2 (H2): Subgroup formation will mediate the negative effects of surface-level social faultlines on social interaction quality (a) and task interaction quality (b).

The effect of surface-level task faultlines on team interaction quality

Surface-level task faultlines are formed when 'hypothetical dividing lines' separate a team into several subgroups based on visible task-related characteristics, such as educational background, functional background, and tenure. Surface-level task faultlines are typically associated with a larger pool of cognitive resources (i.e., task-relevant skills and information). The extended cognitive resource pool increases the flexibility of team members' thoughts, making them see the value in their differences (Bezrukova et al., 2009), shifting their attention from out-group social prejudice to cross-subgroup cooperation and learning. Thus, surface-level task faultlines will increase team social interaction quality. In addition, team members of different task-related subgroups are willing to utilize all cognitive resources and engage in intensive information elaboration and knowledge sharing (Gibson & Vermeulen, 2003). Therefore, surface-level task faultlines may operate as healthy divides for task interaction.

Hypothesis 3 (H3): Surface-level task faultlines have positive effects on both social interaction quality (a) and task interaction quality (b).

We propose that surface-level task faultlines may not lead to perceived subgroup formation. Surface-level task skills serve as complementary resources. Thus, team members see the value of task-related differences rather than generating out-group social prejudice based on task-related differences (Bezrukova et al., 2009). Therefore, surface-level task faultlines do not make sense to the individual's in and out-group perception. As a result, surface-level task faultlines are not salient in predicting the formation of subgroups. Accordingly, the subgroup formation is unlikely to mediate the positive effect of surface-level task faultlines on team interactions.

Hypothesis 4 (H4): Subgroup formation will not mediate the positive effects of surface-level task faultlines on social interaction quality (a) and task interaction quality (b).

The effect of deep-level social faultlines on team interaction quality

Deep-level social faultlines are 'hypothetical dividing lines' that divide a team into several subgroups on the basis of the alignment of deep-level characteristics that shape people's social psychology, such as personality, social attitudes, and values. Given the invisibility of deep-level social-related attributes, disputes among team members caused by deep-level social-related differences may cause severe polarization between subgroups, leading to less cohesion and more conflict (Ren, 2008). Therefore, deep-level social faultlines can have a more detrimental impact on team social interaction quality. In addition, deep-level personality, attitude, or value differences may lead to disputes in task goals. For example, people with more proactive personalities are more likely to promote task change, while less proactive people will have more passive attitudes toward changing. As a result, a dispute about how to complete a task may occur. Therefore, deep-level social faultlines may also interfere with task interactions.

Hypothesis 5 (H5): Deep-level social faultlines have negative effects on both social interaction quality (a) and task interaction quality (b).

We propose that deep-level social faultlines increase the potential for subgroup formation. Although deep-level attributes (e.g., attitudes, values, and personality) are not easily accessible, they have the normative fit. That is, it is meaningful to develop the cognitive frame of reference of an individual. For example, people with different personalities may have distinct beliefs about team cooperation (Emich, Lu, Ferguson, Peterson, & McCourt, 2022) and different expectations about task design (Cunningham, 2015), which provide a salient basis for subgroup formation at the workplace. Combined with the arguments about the negative influences of subgroup formation on team social and task interaction quality, we argue that subgroup formation is likely to mediate the negative effects of deep-level social faultlines on team interactions.

Hypothesis 6 (H6): Subgroup formation will mediate the negative effects of deep-level social faultlines on social interaction quality (a) and task interaction quality (b).

The effect of deep-level task faultlines on team interaction quality

Deep-level social faultlines exist when a team is divided into several subgroups based on members' alignment on deep-level cognitive features related to team tasks, such as decision-making style, task goal commitment, and task meaningfulness. Differentiated from surface-level task faultlines that indicate diverse cognitive resources, deep-level task faultlines mainly reflect team members' working styles or attitudes toward tasks. Deep-level faultlines would be more consequential when the attitude object was the task (or task goal) (Harrison et al., 2002). Members in teams with strong deep-level task faultlines are aware of differences in their way of thought, leading to higher levels of disagreement (Fitzgerald, 2013) and lower levels of team cohesion and cooperation. As a result, deep-level task faultlines will damage social and task interaction quality.

Hypothesis 7 (H7): Deep-level task faultlines have negative effects on both social interaction quality (a) and task interaction quality (b).

We propose that deep-level task faultlines are salient to increase the potential for subgroup formation. Deep-level task attributes, such as decision-making style, task goal commitment, and task meaningfulness, have a high normative fit. This is because group identification is affected by deep-level beliefs relevant to tasks (Van Knippenberg, Haslam, & Platow, 2003). Therefore, the normative fit of deep-level task attributes increases the salience of the categorization process, resulting in subgroup formation. Accordingly, we suggest that the subgroup formation mediates the negative effects of deep-level task faultlines on team interactions.

Hypothesis 8 (H8): Subgroup formation will mediate the negative effects of deep-level task faultlines on social interaction quality (a) and task interaction quality (b).

Methods

Sample

The sample of Study 2 was extracted from the sample of Study 1. First, we included articles examining the effects of dormant faultlines, which can be clearly classified into social and task faultlines (classifications could be found in the measures of faultlines, 47 articles were excluded). Second, we only included articles providing the correlations between dormant faultlines, subgroup formation, and team interaction quality (16 articles were excluded). Based on the inclusion criteria, 63 articles were excluded (see Figure 1 and Table A1). Finally, 32 articles were included in Study 2's meta-analysis.

Coding

All studies were coded by two authors. The inter-rater reliability coefficients ranged from 0.88 to 0.96, suggesting a reliable coding process.

Meta-analytic techniques

To examine the effects of dormant faultlines on team interaction quality, we followed Schmidt and Hunter's (2015) meta-analysis methods to calculate the bivariate correlations across studies. As shown in Table 7, we provided the sample size-weighted correlations ($\bar{r}$), the SD of the correlation (SDr), the weighted mean correlation adjusted for measurement error ($\bar{\rho}$), the SD of $\bar{\rho}$ (SDρ), and 95% confidence intervals (CIs). In addition, we used the MASEM to estimate the mediating effects of subgroup formation between dormant faultlines and subgroup formation (Cheung, 2015). Restricted by the limited sample size, we tested each mediation path separately.

Measures

Surface-level social and task faultlines. When testing the effects of faultlines on team interaction quality, we distinguished between surface-level social and task faultlines. Faultlines that are formed from social category attributes (i.e., gender, age, race/ethnicity, nationality) were labeled as surface-level social faultlines; Faultlines that are formed from observable task-related attributes (i.e., education, functional background, tenure, and career experience) were labeled as surface-level task faultlines; Faultlines based on hybrid observable attributes of social category and task-related backgrounds or

Table 7. The direct effects of faultlines on interaction quality

	k	*N*	$\bar{r}$	SD_r	$\bar{\rho}$	SD_ρ	95% CI
Surface-level social faultlines → Social interaction quality	18	949	−0.065*	0.217	−0.072*	0.240	[−0.135, −0.009]
Surface-level social faultlines → Task interaction quality	15	939	−0.076*	0.142	−0.085**	0.160	[−0.149, −0.021]
Surface-level task faultlines → Social interaction quality	3	186	0.079	0.197	0.087	0.218	[−0.060, 0.235]
Surface-level task faultlines → Task interaction quality	5	381	0.155**	0.094	0.173***	0.105	[0.071, 0.276]
Deep-level social faultlines → Social interaction quality	4	349	−0.120	0.207	−0.134*	0.217	[−0.243, −0.029]
Deep-level social faultlines → Task interaction quality	3	188	−0.227**	0.050	−0.247***	0.054	[−0.392, −0.102]
Deep -level task faultlines → Social interaction quality	5	344	−0.231***	0.262	−0.254***	0.288	[−0.352, −0.156]
Deep-level task faultlines → Task interaction quality	3	165	−0.261***	0.083	−0.280***	0.082	[−0.402, −0.157]

Notes: *k* = total number of effect sizes; *N* = total sample size; $\bar{r}$ = sample-size-weighted mean observed correlations; SD *r* = standard deviation of observed correlations; $\bar{\rho}$ = estimate of weighted mean correlation adjusted for measurement error; SD ρ = standard deviation of $\bar{\rho}$; 95% CI = 95% confidence interval around $\bar{\rho}$; ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$.

other observable attributes were labeled as other surface-level faultlines, which were excluded from the meta-analysis in Study 2 (see the coding in Table A1).

Deep-level social and task faultlines. Similarly, when testing the effects of faultlines on team interaction quality, we further distinguished between deep-level social and task faultlines. Faultlines formed from unobserved social psychology characteristics (i.e., relationship values, personality, attitudes, and cultural orientation) were labeled as deep-level social faultlines; Faultlines formed from unobservable cognitive features related to team tasks (i.e., decision-making style faultlines, goal commitment, task meaningfulness) were labeled as deep-level task faultlines; Faultlines based on hybrid attributes of social psychology and task-related cognition or other unobservable attributes were labeled as other surface-level faultlines, which were excluded from the meta-analysis in Study 2 when testing the effects of deep-level social and task faultlines on team interaction quality (see the coding in Table A1).

Social and task interaction quality. We are interested in how social and task faultlines will impact social and task team interaction quality, respectively. Therefore, we further distinguished between social and task interaction quality. On the one hand, social integration quality refers to the status of team members' social attachment and social relations. We conceptualize social interaction quality as an umbrella of team relationship conflict (inversed term, team trust, team identification, team relational harmony, team cohesion, team social learning, team social/ affective integration, and team cooperation reciprocity. On the other hand, task integration quality refers to the status of team task-related interaction, such as team task conflict (inversed term), knowledge hiding (inversed term), team task learning, team cognitive integration, team information sharing/ elaboration, and team communication (see Table 1). All the variables of team interaction quality are measured subjectively through ratings by team members.

Results

The direct effects of dormant faultlines on team interaction quality

As shown in Table 7, surface-level social faultlines have harmful effects on both social interaction quality ($\bar{\rho} = -0.072$, *95%CI* [−0.135, −0.009]) and task interaction quality ($\bar{\rho} = -0.085$, *95%CI* [−0.149, −0.021]). Thus, Hypotheses 1a and 1b were supported. In contrast, we found that surface-level task faultlines have beneficial effects on both team social interaction quality ($\bar{\rho} = 0.087$, *95%CI* −0.060, 0.235]) and team task interaction quality ($\bar{\rho} = 0.173$, *95%CI* [0.071, 0.276]). But the effect is only significant on task interaction quality. Thus, Hypothesis 3b was supported.

With respect to deep-level faultlines, we found that deep-level social faultlines are harmful to both social interaction quality ($\bar{\rho} = -0.134$, *95%CI* [−0.243, −0.029]) and task interaction quality ($\bar{\rho} = -0.247$, *95%CI* [−0.392, −0.102]). Similarly, deep-level task faultlines also have significant and negative effects on both social interaction quality ($\bar{\rho} = -0.254$, *95%CI* [−0.352, −0.156]) and task interaction quality ($\bar{\rho} = -0.280$, *95%CI* [−0.402, −0.157]). Thus, Hypotheses 5a, 5b, 7a, and 7b were supported.

The mediation effects of subgroup formation

Table 8 presents the results of the mediation effects of subgroup formation. The results show that surface-level social faultlines have negative indirect effects on team social interaction quality (*Indirect effect* = −0.038, *95%CI* [−0.091, 0.014]) and task interaction quality (*Indirect effect* = −0.043, *95%CI* [−0.101, −0.003]) through subgroup formation. But the indirect effect on social interaction is not significant. Therefore, subgroup formation only mediates the negative effect of surface-level social faultlines on task interaction quality, supporting Hypothesis 2b. In contrast, surface-level task faultlines have insignificant indirect effects on team social interaction quality (*Indirect effect* = 0.020, *95%CI* [−0.051, 0.097]) and task interaction quality (*Indirect effect* = 0.007, *95%CI* [−0.049, 0.059]) through subgroup formation. Thus, subgroup formation fails to mediate the positive effects of surface-level task faultlines on team interaction qualities, supporting Hypotheses 4a and 4b.

Table 8. The indirect effects of faultlines on interaction quality through subgroup formation

Path	Direct effect	Indirect effect	95% CI
Surface-level social faultlines → Subgroup formation → Social interaction quality	0.037	−0.038	[−0.091, 0.014]
Surface-level social faultlines → Subgroup formation → Task interaction quality	−0.051	−0.043	[−0.101, −0.003]
Surface-level task faultlines → Subgroup formation → Social interaction quality	0.057	0.020	[−0.051, 0.097]
Surface-level task faultlines → Subgroup formation → Task interaction quality	0.170*	0.007	[−0.049, 0.059]
The indirect effects of deep-level social and task faultlines through subgroup formation are provided in Table A2.			

Notes: Standardized coefficients of direct and indirect effects are reported; 95% CI = 95% confidence interval around the indirect effects are present in brackets; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Restricted by the sample size, we were unable to test the indirect effects of deep-level social and task faultlines in a robust way[3] (Schmidt & Hunter, 2015). Therefore, we relegate the results to Table A2 and suggest that readers interpret these results with caution. The results in Table A2 show that deep-level social faultlines work through subgroup formation to significantly and negatively impact team social interaction quality (*Indirect effect* = −0.295, *95%CI* [−0.412, −0.200]) and task interaction quality (*Indirect effect* = −0.257, *95%CI* [−0.365, −0.127]). Similarly, deep-level task faultlines work through subgroup formation to significantly and negatively impact team social interaction quality (*Indirect effect* = −0.208, *95%CI* [−0.312, −0.127]) and task interaction quality (*Indirect effect* = −0.216, *95%CI* [−0.316, −0.131]).

Discussion

We developed a framework to bridge dormant faultlines with perceived subgroup formation and team interaction quality. Study 1 looks at how subgroup formation and team interaction quality act as serial mediums through which surface-level faultlines and deep-level dormant faultlines exert effects on team performance. In addition, the meta-analysis in Study 1 examines whether the influences of surface-level and deep-level faultlines grow or shrink over time. Study 2 offers a more nuanced look at the effects of faultlines on team interaction. It conducts meta-analyses to examine how surface-level social faultlines, surface-level task faultlines, deep-level social faultlines, and deep-level task faultlines will impact social and task team interaction quality, respectively.

Research Findings

Relationships among faultlines, subgroup formations, team interaction quality, and team performance

Our results in Study 1 suggest that both surface-level faultlines and deep-level faultlines lead to the formation of actual subgroups. This confirms the homophily assumption that team members tend to associate with similar members by forming subgroups while giving negative responses to others on another side of the dormant faultline (Flynn et al., 2010). In addition, we go beyond previous works by comparing the impacts of surface-level faultlines and deep-level faultlines on subgroup formation. We also found that deep-level faultlines are more influential in forming subgroups than surface-level faultlines because deep-level faultlines can provide more accurate and straightforward implications about others (Larson, 2007).

The serial mediation model

In addition, the results of MASEM in Study 1 indicate that subgroup formation and team interaction quality play vital roles in mediating the effects of surface-level and deep-level dormant faultlines on

team performance. Surface-level and deep-level dormant faultlines damage team interaction quality through subgroup formation. These results suggest that the harmful effects of dormant faultlines on team interaction quality heavily rely on the perceived subgroup formation (Mäs et al., 2013). Further, we find that surface-level faultlines and deep-level faultlines cannot directly decrease team performance. Instead, they exert negative influences on team performance through subgroup formation and team interaction quality in sequence. These findings indicate that both interaction structure and interaction quality are necessary mediums. By developing a serial mediation framework, this study advances our understanding of dormant faultlines' effects on team interactions and the final performance. Unlike previous faultline literature that uses dormant faultlines to represent team members' actual interaction structures, this meta-analysis pulls apart dormant faultlines from team interaction structures and provides a more nuanced view of processes through which faultlines may matter.

The moderating effect of interaction time

Furthermore, by identifying interaction time as a moderator, Study 1 differentiates the influences of surface-level faultlines and deep-level faultlines over time. Our results suggest a tendency that surface-level faultlines show weaker effects on subgroup formation and team performance in long-time interaction than in short-time interaction. In contrast, the influence of deep-level faultlines on team interaction quality and team performance is reinforced in long-time interaction. Although several moderating effects are in hypothesized tendency, they are not significant. We suppose that it is owing to the limited number of studies included in moderation analysis. The moderating effects will be supported if more studies are integrated into future research. Harrison et al. (2002) suggested that deep-level diversity becomes more influential than surface-level diversity over time because team members have more time and opportunities to learn from each other. We extended this line of research by confirming that surface-level and deep-level faultlines are also in accordance with the regulation. Therefore, distinguishing between different faultlines helps advance our understanding of how surface-level and deep-level faultlines work separately.

The effects of dormant faultlines on team interaction quality in greater detail

We further distinguished between social and task forms of surface-level and deep-level faultlines in Study 2. We found that surface-level and deep-level social faultlines have similar positive effects on team interaction quality. However, it was interesting to note that surface-level and deep-level task faultlines represented differentiated effects. Surface-level task faultlines are found to be beneficial to team interaction quality, while deep-level task faultlines are harmful to team interaction quality. It is because surface-level task faultlines are formed from educational and functional backgrounds, which indicate a larger pool of domain-relevant skills. Team members are more willing to accept their skill differences, boosting beneficial expression, elaboration, and cooperation (Van Dijk et al., 2012). Therefore, surface-level task faultlines will contribute to team interaction quality and performance. However, deep-level task faultlines are based on decision-making style, goal commitment, and task meaningfulness, deeply reflecting team members' working style or attitude toward tasks. All these attributes are rooted deeply in an individual's cognition. Members in teams with strong deep-level task faultlines are aware of differences in their way of thought, leading to higher levels of disagreement and damaging the team function (Fitzgerald, 2013). Further exploring these additional relationships seems worthwhile, as this would imply that we should distinguish the surface-level and deep-level task faultlines and pay attention to their distinct properties in predicting job-related variables.

Further, the results of mediation effects in Study 2 confirm that dormant faultlines (i.e., surface-level social faultlines, deep-level social, and task faultlines) work through subgroup formation to negatively impact team interaction quality. Especially interesting is that the positive effects of surface-level task faultlines on team interaction quality are not mediated by subgroup formation. So, it is essential to realize that dormant faultlines do not always work through subgroup formation to exert influence. On the one hand, we found that the effects of dormant faultlines on team functioning were exerted through subgroup formation. And this finding is aligned with the perspective of previous research (e.g., Jehn & Bezrukova, 2010). On the other hand, when it comes to the positive effect of faultlines,

surface-level task faultlines have impacts on team interactions, regardless of whether faultlines are activated into subgroups or not.

Theoretical Implications

Our study enriches our understanding of the faultline literature in several ways. It provides cumulative evidence of how surface-level and deep-level faultlines impact subgroup formation, team interaction quality, and team performance. Prior meta-analyses mainly pay attention to the effect of demographic faultlines (e.g., Thatcher & Patel, 2012). By distinguishing between different faultline types, we identified the differing effects of surface-level social faultlines, surface-level task faultlines, deep-level social faultlines, and deep-level task faultlines. These differing findings suggest that it is meaningful to divide faultlines into subcategories and to compare their differentiated effects in greater detail.

A second contribution is that we completely test a serial mediation framework from faultlines to team performance. Unlike previous meta-analyses that detect the direct effects of dormant faultlines, this meta-analysis provides a more nuanced analysis of the process through which faultlines may matter. We found that subgroup formation and team interaction quality are essential mediums through which surface-level and deep-level faultlines damage team performance.

Finally, by introducing the moderating role of team interaction time, we further examined the faultlines' effects over time. The results of moderating analysis provide insight into how the influences of surface-level and deep-level faultlines fade or strengthen in the long term.

Managerial Implications

Meta-analysis offers a solid basis for generating universal managerial implications. First, the influences of deep-level faultlines on team interaction quality and performance grow stronger in the long-term, but the influences of surface-level faultlines become weaker. Thus, in the long run, the challenge managers have is to analyze team members' deep-level attributes. This is especially meaningful for work teams in the Chinese context, in which people are more veiled and implicit in expressing themselves. To overcome deep-level faultline's negative effects in such a context, managers are recommended to take integration actions to bridge team members who differ in underlying attributes. For example, managers should encourage team members to express themselves openly and resolve problems that arise from deep-level differences in a constructive way.

Second, to avoid the dysfunction of diverse teams, managers should prevent the formation of subgroups. Our meta-analysis indicates that dormant faultlines (i.e., surface-level social faultlines, deep-level social, and task faultlines) mainly exert detrimental impacts on team interaction qualities through the subgroup formation. This is especially true in the Chinese context valuing collectivist culture (Hofstede, 1991), as it is a popular trend for Chinese people to develop small coalitions or cliques in the workplace (i.e., subgroups) to seek support. Thus, we recommend that Chinese managers offer special training to foster team cohesion and highlight the potential value of diversity. This will help reduce out-group prejudice and ultimately prevent the formation of subgroups, such as cliques, factions, and coalitions.

Third, we found that faultlines need not erupt into negative team interactions. Instead, surface-level task faultlines are especially likely to be beneficial. Thus, managers should raise awareness about the potential benefits of differences in task-related attributes. This suggestion is in accordance with the Chinese idiom 'seeking common ground while reserving differences'. That is, managers should build a team with members differing in the task-related backgrounds and take advantage of surface-level task faultlines by setting common goals and encouraging constructive discussion among team members.

Limitations and future research directions

Our study is still limited in several ways. First, several hypotheses testing were based on a small number of effect sizes, especially in the relationships between deep-level faultlines and subgroup formation. Therefore, analyses based on additional samples will produce more stable results.

Secondly, the correlations that populate the meta-matrix are mainly based on cross-sectional research, so we only use team type (short-term/long-term) as a proxy of interaction time. We cannot fully conclude if faultlines grow or shrink over time because this isn't built off of longitudinal studies. A future meta-analysis that includes only longitudinal research could help clarify the actual changes in the influences of surface-level faultlines and deep-level faultlines over time.

Thirdly, the framework of this meta-analysis separates the subgroup process and team interaction quality. Subgroup formation within a team reflects the overall network interaction structure among team members, whereas interaction quality mainly indicates the exchange content in team interaction processes. However, it has long been recognized that all team interaction processes are embedded in the network structure (Crawford & Lepine, 2013). Therefore, the faultline literature should complement team interaction quality with the subgroup structure. For example, future research could examine conflict, trust, and information exchange in the context of inter or intra-subgroup relationships rather than a shared team-level construct (Bezrukova & Jehn, 2003; Perry, 2009). Further, the differentiation between intra- and inter-subgroup interactions would allow us to account for team situations. For example, team members develop mutual trust and common identity within a subgroup, while they distract their attention from developing a high commitment to the whole team. Therefore, the combination of subgroup structure and team interaction quality could help further uncover the team functioning with multiple subgroups.

Last, we only focused on the influences of surface-level or deep-level faultlines in isolation. However, due to the sample limitation, we did not consider the possibility that surface-level and deep-level faultlines may interact to affect team outcomes. In fact, team members who share similar surface-level characteristics may be different or similar in deep-level characteristics. For example, on the one hand, people of the same age are likely to process a similar mindset (deep-level attribute) because they are currently at a similar point in their life course (e.g., being married, being parents, or considering retirement). And people of the same gender are suggested to have similar values (e.g., Carton & Cummings, 2013). On the other hand, it is also possible that people of similar age and gender are opposite in political philosophies (e.g., Democrats vs. Republicans). If surface-level attributes are aligned with other deep-level differences, initial prejudice rooted in surface-level attributes is likely to be reinforced over time. Conversely, when members within the same subgroup on surface-level characteristics hold different deep-level characteristics, the influences of surface-level faultlines may mitigate and give way to deep-level faultlines in the long run. And the cross-cutting of surface-level and deep-level faultlines posited to minimize inter-subgroup biases because team members see less salient differences (Homan, van Knippenberg, Van Kleef, & De Dreu, 2007). Therefore, future researchers are encouraged to look at the interactive effects of surface-level and deep-level attributes, providing a more comprehensive explanation for the mixed faultline effects on team functioning (e.g., Lau & Murnighan, 2005).

Conclusion

Based on the results of a series of meta-analyses, we conclude that both subgroup formation and team interaction quality are necessary mediums through which surface-level and deep-level faultlines damage team performance. In addition, our findings highlight the moderating role of interaction time because the effects of surface-level and deep-level faultlines differentiated over time. Further, we found that surface-level and deep-level social faultlines are detrimental. But the impacts of surface-level and deep-level task faultlines are in opposite directions. Future research endeavors should continue to examine the effects of surface-level vs. deep-level faultlines and the conditions that may differentiate their effects.

Notes

1. We used an ANOVA procedure with the relationship between dormant faultlines and team performance as the criterion variable and the measurement of performance (objective/subjective) as the predictor variable. We achieved insignificant F-values for the correlation between surface-level faultlines and team performance ($F(1/45) = 0.002$, $p = 0.969$) and the correlation between deep-level faultlines and team performance ($F(1/10) = 0.371$, $p = 0.557$).

2. The $\bar{\rho}$ was calculated only based on three primary studies/effect sizes. Thus, the result may subject to secondary sampling error. We suggest that readers interpret the result with caution.
3. The k on the relationship between deep-level social (task) faultlines and subgroup formation is less than 3. Thus, k's are not large enough to conduct the MASEM and calculate the indirect effects.

Data Availability Statement. The data sets that support the findings of this article are openly available in the Open Science Framework at https://osf.io/u9dqw/

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Appendix I

Table A1. Summary about team faultline research, 2002–2022

	Authors	Article type	Sample	Faultlines type/Subgroup formation	Interaction time
1	Adair, Liang, and Hideg (2017)[a]	Journal Article	47	Surface-level (social): gender, whether they were born in Canada or not, their broad ethnic group	Short-term
2	Ahmad (2014)[a]	Dissertation	53	Deep-level (social): relationship values; Deep-level (task): work time orientation	Short-term
3	Ahmad and Lutters (2015)	Conference	200	Subgroup formation	Long-term
4	Alino (2011)	Journal Article	34	Subgroup formation	Short-term
5	Antino, Rico, and Thatcher (2019)	Journal Article	41	Subgroup formation	Long-term
6	Badura (2019)	Dissertation	46	Deep-level (other): LMX	Long-term
7	Bahmani Semnani-Azad, Adair, and Sycara (2018)	Conference	24	Subgroup formation	Short-term
8	Bezrukova and Jehn (2003)[a]	Conference	24	Surface-level (social): race, national	Short-term
9	Bezrukova et al. (2009)[a]	Journal Article	76	Surface-level (social): age, gender; Surface-level (task): education, tenure	Long-term
10	Bezrukova et al. (2016)[b]	Journal Article	30	Surface-level (social): age, race, nationality	Long-term
11	Boyraz (2019)	Journal Article	27	Surface-level (other): location, function, tenure, gender; Subgroup formation	Long-term
12	Calabrò, Santulli, Torchia, and Gallucci (2021)[b]	Journal Article	111	Surface-level (social): age, gender; Surface-level (task): experience, functional background, university degree	Long-term

(*Continued*)

Table A1. (*Continued.*)

	Authors	Article type	Sample	Faultlines type/Subgroup formation	Interaction time
13	Carton and Cummings (2013)[b]	Journal Article	326	Surface-level (social): age, gender; Surface-level (task): business unit and reporting channel	Long-term
14	Chen, Liang, Feng, and Zhang (2023)	Journal Article	67	Surface-level (other): age, education level, tenure	Long-term
15	Chen, Liang, and Zhang (2019a)[a]	Journal Article	95	Surface-level (social): age, gender; Surface-level (task): education level, education specialty, tenure	Long-term
16	Chiu and Staples (2013)	Journal Article	40	Subgroup formation	Short-term
17	Choi and Sy (2010)[a]	Journal Article	62	Surface-level (other): gender, age, race, tenure Surface-level (social): gender, age, race	Long-term
18	Chung, Ko, and Kim (2020)	Journal Article	50	Surface-level (other): age, gender, rank, team tenure	Long-term
19	Cooper et al. (2014)[b]	Journal Article	380	Surface-level (task): education, functional background, tenure	Long-term
20	Creon and Schermuly (2019)[a]	Journal Article	58	Surface-level (social): age, gender; Subgroup formation	Short-term
21	Cronin et al. (2011)	Journal Article	88	Subgroup formation	Short-term
22	Crucke and Knockaert (2016)[a]	Journal Article	79	Surface-level (social): stakeholder group represented, gender and age	Long-term
23	Cunningham (2015)[a]	Dissertation	94	Surface-level (social): sex, nationality	Short-term
24	Emich et al. (2022)[a]	Journal Article	92	Deep-level (social): neuroticism-agreeableness	Long-term
25	Fitzgerald (2013)[b]	Dissertation	86	Deep-level (task): rational decision-making style, spontaneous decision-making style	Short-term
26	Georgakakis, Greve, and Ruigrok (2017)[b]	Journal Article	347	Surface-level (social): age, gender; Surface-level (task): career experience, functional background	Long-term
27	Gerlach (2017)-Study 2	Dissertation	61	Surface-level (other): age, course of study, semester term	Long-term
28	Gerlach and Gockel (2017)	Journal Article	45	Surface-level (other): gender, age, and tenure	Long-term

(*Continued*)

Table A1. (*Continued.*)

	Authors	Article type	Sample	Faultlines type/Subgroup formation	Interaction time
29	Gibson and Vermeulen (2003)	Journal Article	156	Surface-level (other): sex, ethnic, functional background, tenure, age	Short-term
30	Greer, Jehn, Thatcher, and Mannix (2007a)-Study 1	Conference	60	Surface-level (other): gender, race, work experience, function	Short-term
30	Greer, Jehn, Thatcher, and Mannix (2007a)-Study 2	Conference	28	Surface-level (other): gender, race, work experience, and job function	Short-term
31	Greer, Jehn, and van Beest (2007b)	Conference	27	Surface-level (other): gender, educational level; Subgroup formation	Long-term
32	Hermes (2012)[a]	Research report	313	Surface-level (social): age, gender	Long-term
33	Homan, Hollenbeck, Humphrey, Knippenberg, Ilgen, and Van Kleef (2008)[a]	Journal Article	58	Surface-level (Social): region, gender	Short-term
34	Homan, Greer, Jehn and Koning (2010)	Journal Article	39	Surface-level (other): sex, ethnicity, education, tenure	Long-term
35	Hutzschenreuter and Horstkotte (2013)[b]	Journal Article	61	Surface-level (social): age, nationality; Surface-level (task): tenure, education background, level of formal education	Long-term
36	Jehn and Bezrukova (2010)[a]	Journal Article	32	Surface-level (Social): region, gender; Subgroup formation	Short-term
37	Jiang et al. (2012)[a]	Journal Article	64	Surface-level (social): Nationality Surface-level (task): Specialty	Short-term
38	Kramer (2018)	Dissertation	135	Subgroup formation	Short-term
39	Kwon and Lee (2020)	Journal Article	82	Surface-level (other): age, gender, tenure	Long-term
40	Lau and Murnighan (2005)[a]	Journal Article	79	Surface-level (Social): ethnicity, sex	Short-term
41	Li and Hambrick (2005)	Journal Article	71	Surface-level (other): age, tenure, gender, and ethnicity	Long-term
42	Li and Jones (2019)	Journal Article	295	Surface-level (other): age, gender, ethnicity, tenure, functional background	Long-term
43	Li et al. (2018)[b]	Journal Article	163	Surface-level (social): sex, age; Surface-level (task): functional background, educational level, tenure	Long-term
44	Liu (2020)[a]	Dissertation	40	Deep-level (social): personality Subgroup formation	Short-term

(*Continued*)

Table A1. (*Continued.*)

	Authors	Article type	Sample	Faultlines type/Subgroup formation	Interaction time
45	Liu (2015)	Dissertation	46	Deep-level (other): LMX, managerial position Subgroup formation	Long-term
46	Luan, Ren and Hao (2019)[a]	Journal Article	102	Surface-level (social): age, gender; Surface-level (taskl): tenure, education; Subgroup formation	Long-term
47	Ma et al. (2022)[a]	Journal Article	66	Surface-level (social): age, gender; Surface-level (task): educational specialization, education level, entrepreneurial experience	Long-term
48	Mach and Baruch (2015)[a]	Journal Article	73	Surface-level (social): gender, age	Short-term
49	Mayo, van Knippenberg, Guillén, and Firfiray (2016)[a]	Journal Article	38	Surface-level (social): gender, race	Long-term
50	Meyer and Schermuly (2012)	Journal Article	43	Surface-level (other): gender, age, and field of study	Short-term
51	Meyer, Shemla, and Schermuly (2011)	Journal Article	43	Surface-level (other): gender, seating position	Short-term
52	Molleman (2005)[a]	Journal Article	99	Surface-level (other): gender, age, and having a part-time job; Deep-level (social): personality trait; Deep-level (task): ability	Short-term
53	Ndofor, Sirmon, and He (2015)	Journal Article	49	Surface-level (other): age, tenure, functional background	Long-term
54	Pearsall, Ellis, and Evans (2008)[a]	Journal Article	80	Surface-level (social): gender	Short-term
55	Perry (2009)	Dissertation	43	Surface-level (other): sex, age, race, nationality, major; Subgroup formation	Short-term
56	Ping, Yi-Cong, Shao-Bin, and Shuanz-Wen (2017)[b]	Conference	155	Surface-level (social): age, gender; Surface-level (task): educational background	Long-term
57	Polzer, Crisp, Jarvenpaa, and Kim (2006)	Journal Article	45	Surface-level (other): location	Short-term
58	Ponomareva (2010)	Dissertation	11	Surface-level (other): ethnic, age, education	Short-term
59	Popova (2018)[a]	Dissertation	32	Surface-level (social): gender, age, nationality, origin; Subgroup formation	Long-term
60	Przybilla and Wiesche (2019)[b]	Conference	424	Surface-level (social): age, gender; Surface-level (task): tenure	Short-term

(*Continued*)

Table A1. (*Continued.*)

	Authors	Article type	Sample	Faultlines type/Subgroup formation	Interaction time
61	Qu and Liu (2017)[a]	Journal Article	66	Surface-level (task): functional background, education background, work tenure	Long-term
62	Ren (2008)[a]	Dissertation	148	Surface-level (other): age, gender, ethnicity, status; Deep-level (task): goal commitment, task meaningfulness	Short-term
63	Ren et al. (2015)	Journal Article	148	Deep-level (other): professional level, cultural background, task meaningfulness	Short-term
64	Richards (2014)[a]	Dissertation	95	Surface-level (social): gender, race, age	Long-term
65	Rico, Molleman, Sánchez-Manzanares, and Van der Vegt (2007)[a]	Journal Article	52	Deep-level (task): conscientiousness, major background	Short-term
66	Rico, Sánchez-Manzanares, Antino, and Lau (2012)	Journal Article	72	Subgroup formation	Short-term
67	Robert (2016)	Journal Article	25	Subgroup formation	Short-term
68	Rupert, Blomme, Dragt, and Jehn (2016)[a]	Journal Article	52	Surface-level (task): educational level, work experience	Long-term
69	Rupert and Jehn (2008a)	Conference	47	Subgroup formation	Long-term
70	Rupert and Jehn (2008b)	Conference	70	Subgroup formation	Long-term
71	Ryser (2015)[a]	Dissertation	24	Deep-level (task): discipline of study	Short-term
72	Schölmerich et al. (2016)[a]	Journal Article	44	Surface-level (social): gender, age; Surface-level (task): education level, team tenure	Long-term
73	Schölmerich, Schermuly, and Deller (2017)[b]	Journal Article	41	Surface-level (social): age, gender	Long-term
74	Schulte, Götz, Partsch, Goldmann, Smidt, and Meyer (2020)	Journal Article	58	Subgroup formation	Long-term
75	Shemla and Wegge (2019)	Journal Article	61	Subgroup formation	Long-term
76	Shen and Gallivan (2008)	Conference	22	Subgroup formation	Short-term
77	Shen and Gallivan (2011)	Conference	42	Surface-level (other): gender, education, race, years of working experience, functional background; Subgroup formation	Short-term
78	Spell, Bezrukova, Haar, and Spell (2011)	Journal Article	42	Surface-level (other): level of education, sex, race, tenure, age	Long-term

(*Continued*)

Table A1. (*Continued.*)

	Authors	Article type	Sample	Faultlines type/Subgroup formation	Interaction time
79	Straube, Meinecke, Schneider, and Kauffeld (2018)[b]	Journal Article	34	Surface-level (social): age, gender	Short-term
80	Su (2019)	Dissertation	56	Surface-level (other): age, gender, educational levels, functional background Deep-level (other): perceived power	Long-term
81	Su, Luo, Lau, and de Jong (2022)[b]	Journal Article	48	Surface-level (social): age, gender, nationality	Short-term
82	Tan (2013)	Dissertation	79	Subgroup formation	Short-term
83	Thatcher, Jehn, and Zanutto (2003)	Journal Article	144	Surface-level (other): work experience, functional background, degree, sex, age, race, country of origin	Short-term
84	Tiede, Schultheis, and Meyer (2021)	Journal Article	48	Surface-level (other): gender, age, and educational background; Subgroup formation	Long-term
85	Valls, Tomás, González-Romá, and Rico (2021)[a]	Journal Article	60	Surface-level (social): age	Long-term
86	Van Knippenberg, Dawson, West, and Homan (2011)[a]	Journal Article	42	Surface-level (other): tenure, gender, functional Surface-level (task): tenure, functional	Long-term
87	Vandebeek, Voordeckers, Lambrechts, and Huybrechts (2016)	Journal Article	102	Deep-level (other): family membership, type of directorship	Long-term
88	Vora and Markóczy (2012)	Journal Article	22	Surface-level (other): age, gender, ethnicity, specialization in school …	Short-term
89	Wan (2015)[b]	Dissertation	247	Surface-level (social): gender and age; Surface-level (task): education background, educational level	Long-term
90	Wax (2013)	Dissertation	27	Surface-level (other): gender, age, functional expertise; Deep-level (other): narcissism, psychological collectivism, and area of functional expertise	Short-term
91	Xie, Wang, and Qi (2015)	Journal Article	153	Surface-level (other): gender, age, education, tenure	Long-term
92	Xu, Chiu, and Treadway (2019)[b]	Journal Article	67	Surface-level (social): age, gender	Short-term
93	Zellmer-Bruhn, Maloney, Bhappu, and Salvador (2008)	Journal Article	55	Subgroup formation	Long-term

(*Continued*)

Table A1. (*Continued.*)

	Authors	Article type	Sample	Faultlines type/Subgroup formation	Interaction time
94	Zhang, Liang, Zhang, and Qu (2017)[b]	Journal Article	160	Surface-level (social): gender, ethnicity, and native place; Surface-level (task): education, major, and political work experience; Deep-level (other): political network	Long-term
95	Zhang (2020)	Dissertation	71	Deep-level (other): status	Short-term

Notes: [a]Articles that included in Study 2. [b]Although these articles focus on social or task forms of faultlines, they do not provide the correlations between faultlines and team interaction qualities. Therefore, we excluded these articles from Study 2.

Table A2. The indirect effects of deep-level social and task faultlines on interaction quality through subgroup formation

Path	Direct effect	Indirect effect	95% CI
Deep-level social faultlines → Subgroup formation → Social interaction quality	0.254	−0.295	[−0.412, −0.200]
Deep-level social faultlines → Subgroup formation → Task interaction quality	−0.182**	−0.257	[−0.365, −0.162]
Deep -level Task faultlines → Subgroup formation → Social interaction quality	0.054	−0.208	[−0.312, −0.127]
Deep-level Task faultlines → Subgroup formation → Task interaction quality	−0.195**	−0.216	[−0.316, −0.131]

Notes: Standardized coefficients are reported; 95% confidence interval around the indirect effects are present in brackets; *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

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Yue Zhang (zhangyue1218@nwpu.edu.cn) is (present) an assistant professor in School of Public Policy and Administration at the Northwestern Polytechnical University. Dr. Zhang earned her PhD degree from School of Management, Xi'an Jiaotong University. Her current research interests include team management (e.g., team diversity and team faultlines) and strategic leadership (TMT and CEO succession). She has published her work in peer-reviewed journals, e.g., *Journal of Business Research*, *The International Journal of Human Resource Management*, *Journal of Business Psychology*, among others.

Hui Chen (chen1208hui@163.com) is (present) an assistant professor in Ginling College, Nanjing Normal University. Dr. Chen earned her PhD degree from School of Management, Xi'an Jiaotong University. Her research interests include organizational behavior and human resource management. Specifically, she is interested in team management (e.g., team diversity and team faultlines) and leadership (e.g., humble leadership and inclusive leadership). She has published her work in peer-reviewed journals, e.g., *The Journal of Applied Behavioral Science*, *Journal of Organizational Change Management*, among others.

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