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Conflict in cross-functional IT project teams: The amplifying roles of functional background diversity

Completed research paper

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Abstract

Conflicts pervade IT project teams and can be detrimental to team performance. Team diversity affects conflicts and team performance but its role is ambivalent. The moderating role of functional background diversity (FBD) on conflicts and team performance is explored via a hierarchical linear modelling analysis of 200 participants from 41 cross-functional IT project teams. Results corroborate the complexity of relationships between diversity, conflict, and performance by showing that the effect of FBD is contingent on the type of conflicts: FBD does not heighten the adverse effect of relationship conflicts on team performance, but it does amplify the detrimental effect of task conflicts. The study provides evidence that diversity attributes can play a moderating rather than a direct or mediating role on team performance. Moreover, the study's systematic and combined application of several conceptual and methodological recommendations addresses limitations of past studies and underscores the importance of adopting a more nuanced and rigorous approach to examining diversity in teams.

Keywords IT project, Conflict, Teamwork, Functional background diversity, Hierarchical Linear Modeling (Multilevel)

1 Introduction

Teams are prevalent in organizational work, where they are instrumental to the conduct of complex activities such as generating creative solutions, innovating, resolving cross-disciplinary problems, and managing unexpected situations (Kozlowski and Bell 2013; Mathieu et al. 2017). Unsurprisingly, teams play a central role in information technology projects (ITP), such as digital transformation projects or SMACIT (social, mobile, analytics, cloud and Internet of Things) initiatives. ITPs involve complex activities, which are usually conducted by cross-functional project teams (Kane et al. 2019). Such teams bring together highly qualified individuals with various organizational backgrounds, knowledge, expertise, and experience (Klein et al. 2002). Their taskwork stems from the collective effort of members who share information, interact, and collaborate to deliver anticipated artifacts and meet organizations' objectives (Kudaravalli et al. 2017; Marks et al. 2001). Although it is essential that cross-functional project teams perform well, a far too frequent and detrimental by-product of team taskwork is the occurrence of conflicts, which emerge from social interactions between team members and are particularly persistent in ITP cross-functional teams (de Wit et al. 2012; Jiang et al. 2014).

Conflictual situations within IT project teams have been linked to the presence of diversity, which can fuel misunderstandings, tensions, and animosity (Cronin et al. 2011). However, the precise role (or roles) of diversity remain puzzling (Jehn and Bendersky 2003; Jehn and Greer 2013; van Dijk et al. 2017). Several studies suggest that the moment and the way in which different diversity attributes affect a team's processes, emergent states or its outcomes will vary depending on: 1) the team's context, 2) the nature of the taskwork, and/or 3) the type of diversity attribute studied (Greer and Dannals 2017; van Dijk et al. 2017). Thus, our study focuses on the following research question: What is the role of *functional background diversity* (FBD) on conflicts and team performance in the specific context of ITP? We focus on FBD, which captures the extent of professional knowledge and expertise heterogeneity within a team, because of its prevalence in ITP teams and because its study has been limited in the context of contemporary cross-functional project teams (Jackson and Joshi 2011).

In the present study, a multilevel model that examines the moderating effect of FBD on the relationship between perceived conflicts and team performance was developed and tested using a hierarchical linear modelling analysis of survey data collected from 200 participants organized in 41 ITP cross-functional teams. The study results show that FBD's moderating effect depends on whether conflicts involve work-related issues—*task* conflicts—or non-work-related issues—*relationship* conflict (De Dreu and Weingart 2003; Jehn and Greer 2013). More specifically, results indicate that although FBD has no influence on the effect of perceived relationship conflict on team performance, it amplifies the negative effect of perceived task conflict on team performance.

The study makes two main contributions. First, the results show that FBD plays a moderating role, rather than having direct effect on, or being mediated by conflicts, on its relationship to team performance (Jehn and Bendersky 2003). FBD intensifies the perceived disagreements between team members regarding the taskwork but does not affect the perceived interpersonal incompatibility among team members. Since different types of diversity may potentially affect cross-functional teams' dynamics (Jackson and Joshi 2011), our study offers a complementary perspective by showing that diversity attributes can moderate the effects of emergent states or processes on project outcomes (Waller et al. 2016) as well as providing guidance to practitioners in managing cross-functional teams.

Second, the present study identifies and applies a set of well-grounded recommendations on how to address important conceptual and methodological limitations in the extant diversity research: 1) focusing on context-relevant diversity attributes, i.e., FBD in ITP teams (Jiang and Klein 2014; Maloney et al. 2016); 2) aligning the conceptualization of diversity with its operationalization (Harrison and Klein 2007); 3) using bias-corrected diversity formulas (Biemann and Kearney 2010); 4) adopting a multi-level perspective (Kozlowski and Bell 2013); 5) measuring team diversity in organizational settings and most importantly, it is one of the first studies to 6) evaluate the moderating effects of a diversity attribute (Jehn and Bendersky 2003; van Dijk et al. 2017). By being particularly mindful in making these conceptual and methodological choices, we demonstrate the value of adopting a more nuanced and rigorous approach to examining diversity in teams.

2 Theoretical background

2.1 Intragroup conflicts

Conflict is a phenomenon that pervades organizations and teamwork (de Wit et al. 2012). Over the years, a wide variety of conflict definitions have been proposed (e.g. De Dreu and Weingart 2003; de Wit et al. 2012; Greer and Dannals 2017; Jehn 1995). Overall, this body of work suggests the need to distinguish different aspects pertaining to conflicts, such as its nature (i.e., what the conflict is about), the feelings and thoughts experienced by individuals (i.e., emotions and cognition), and the between-person experiences (i.e., the conflict management) (De Dreu et al. 2003). Accordingly, intragroup conflict can be conceptualized as a process which is triggered when an individual perceives substantial differences (e.g., incompatibilities) between how s/he and other individuals think or feel about important goals, values, practices, interests, and/or resources (De Dreu and Gelfand 2008; Greer and Dannals 2017). This definition emphasizes the idea that a latent conflict must first be perceived, i.e., individuals cognitively recognize that substantial differences exist, before becoming manifest, i.e., individual expresses overt behaviors and manage those perceived differences (DeChurch et al. 2013).

In ITP teams, these perceived incompatibilities play a central role as they help team members adjusting how he/she will respond to a conflict episode. Each member perceives conflict episodes differently, and these different perceptions explain why each team member will have different reactions. The way a team member responds to a perceived conflict is a crucial determinant of how the conflict episode will evolve and how a team's outcomes will be affected (Jehn and Chatman 2000). A perceived conflict exists in the mind of an individual and, whether it becomes manifest or not, will depend on how this individual defines and interprets a conflict episode. Thus, the perceived conflict is often more critical than the substantive nature of the conflict itself (De Dreu et al. 2003).

The basic types of teams' conflicts, which stem from the classic distinctions of personal versus work-related issues, are task and relationship conflicts (Greer and Dannals 2017). *Task conflict* is associated with divergences that pertain to work procedures; to policies, ideas, decision-making, judgement and interpretation of facts; and to the distribution of resources. *Relationship conflict* is associated with divergences that are not work-related, such as those pertaining to political preferences, values, personal tastes and interpersonal styles (De Dreu and Weingart 2003; Jehn and Greer 2013). Some studies on intragroup conflict show that, in complex and uncertain contexts, task and relationship conflicts are both negatively associated with team performance. Other studies have shown that task conflicts can affect project teams' performance either positively or negatively, while others have observed negative effects of task conflicts, regardless of the context or the taskwork (De Dreu and Weingart 2003; Jehn 1997; O'Neill et al. 2013).

One explanation for these mixed results is that the relationship between conflicts and performance depends on the type of team being studied and its context (Maloney et al. 2016; O'Neill et al. 2013). In a meta-analysis, De Wit et al. (2012) concluded that task conflict has neither predetermined positive or negative effects on team performance, and that its effects dependent on a team's cultural context and its types. In a later study, DeChurch et al. (2013), suggested studying factors that can moderate the relationship between task conflict and team performance. Regarding the effects of relationship conflicts, most studies observed negative correlations between relationship conflicts and team performance. However, the factors that make relationship conflicts more or less harmful for team performance remain uncertain (Greer and Dannals 2017). Another possible explanation of these mixed results follows from a team's diversity which can have diverging effects depending on the type of diversity studied (Jackson and Joshi 2011). For instance, Jehn et al. (1999) observed that gender and age diversity attributes had positive effects on relationship conflicts. On the opposite, Pelled and al. (1999) observed that age diversity decreased relationship conflicts. Several scholars have called for further studies examining the roles of different types of diversity attributes, as well as adopting a multilevel perspective, to capture the effects of diversity attributes and intragroup conflicts in teams (Greer and Dannals 2017; Jackson and Joshi 2011; Kozlowski and Bell 2013).

2.2 Diversity in ITP cross-functional teams

ITP team members play key roles in ensuring the success of ITPs (Kudaravalli et al. 2017). However, certain characteristics of ITP teams render their management challenging, including their cross-functional and temporary nature, the need for team members to collaborate, coordinate, and share their multidisciplinary expertise and knowledge, as well as the dynamic, complex and unstructured nature of the taskwork (Ghobadi 2015; Klein et al. 2002; Kudaravalli et al. 2017). A diverse team can be defined as a group of workers who represent and possess different perspectives and competencies that are needed for accomplishing a team's taskwork (Srikanth et al. 2016). Team diversity represents

the distribution of differences among team members with respect to one or several attributes. It is a group-level concept and a team is not diverse per se but rather with respect to one or more specific attributes of its members (Harrison and Klein 2007).

According to Jackson and Joshi (2011), the nature of diversity attributes can be characterized along two dimensions: (1) the attribute's *prevailing application* which can be either (a) *task-oriented*, i.e., relevant to accomplishing a task, e.g. tenure or skills, or (b) *relationship-oriented*, i.e., helpful in forming interpersonal relationships, but one that does not directly affect task performance, e.g. age or personality; and (2) the attribute's *perceptibility* which can be either (a) *readily detectable*, i.e., an easily perceived or rapidly identified, e.g. gender or nationality, or (b) *underlying*, i.e., which can be identified only by interacting with a person, e.g. personality, skills or knowledge. Thus, depending on a diversity attribute's prevailing application and perceptibility, its effects and the moment of its manifestation should vary from other types of diversity attributes (Jackson and Joshi 2011).

Workforce diversity can help ITP teams and organizations to innovate, generate new ideas, and enhance their performance (van Knippenberg and Schippers 2007), but several reviews have reported weak or inconsistent effects (e.g., Bell et al. 2011; Horwitz and Horwitz 2007; van Dijk et al. 2017). Results of past studies indicate that relationship-oriented diversity attributes have either no effect or very weak negative effects on team performance. Regarding task-oriented diversity attributes, studies have found positive but very weak effects (Bell et al. 2011; Horwitz and Horwitz 2007). Thus, results seem to suggest that the beneficial or detrimental effects of diversity attributes on teams' dynamics and performance vary from one context to another and from one project team to another. In sum, diversity seems to "matter to team process and performance—but in contingent ways" (Mathieu et al. 2017, p. 457). This has led several researchers to call for more context-specific studies that identify drivers of team performance by exploring the role of context-relevant diversity attributes as well as focusing on key team processes (Jehn and Bendersky 2003; Maloney et al. 2016; van Dijk et al. 2017).

2.3 Context-relevant diversity attribute: Functional background diversity

ITP team members need to intensively collaborate, coordinate, and share information and knowledge (Ghobadi 2015). The specialized knowledge, expertise and experience contributed by each member represent critical resources for conducting work and ultimately benefiting team performance and project success (Kudaravalli et al. 2017). As a result, task-oriented diversity attributes are likely to have a stronger influence on ITP team performance than relationship-oriented attributes (Jackson and Joshi 2011). One task-oriented diversity attribute that captures an ITP team's diversity in terms of knowledge, expertise and experience is members' functional background. Functional background refers to "the distribution of an individual's work history across the different functional specializations that exist in an organization" (Bunderson 2003, p. 459) and can "serve as a proxy for the information, knowledge, skills and expertise that individual brings to a group" (Williams and O'Reilly 1998, p. 101). It reflects the nature of the task-related knowledge, experience and expertise that an individual has acquired throughout his/her professional career. Usually, the more an individual specializes in executing particular tasks, the more productive he/she will be in conducting those specific tasks (Bunderson 2003). A higher-level functional background is also associated with an increased level of tacit knowledge which can be directly transferred to the performance of future taskwork.

3 Research hypotheses

Following Harrison and Klein's (2007) call for multilevel analysis of diversity and more context-focused studies (Jehn and Greer 2013; Maloney et al. 2016), we developed and tested a multilevel research model (Figure 1). The model posits that FBD will influence team performance and will moderate the relationships between perceived task conflict and team performance as well as between perceived relationship conflict and team performance.

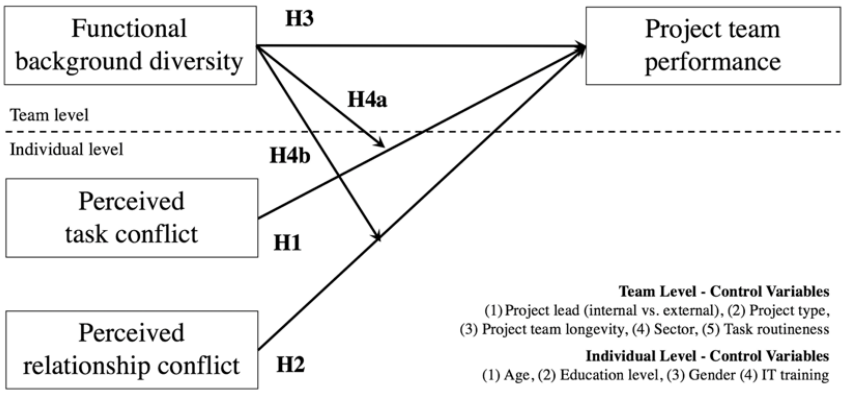

Figure 1: Research Model

3.1 Perceived task and relationship conflict and team performance (H1, H2)

One key challenge faced by ITP team members is coping with intragroup conflicts (Jiang et al. 2014). Some researchers have observed a positive relationship between task conflict and team performance but a negative one between relationship conflict and team performance (Jehn 1994; Jehn 1995). However, most subsequent studies did not replicate the results related to task conflict, and recent meta-analyses found that both task and relationship conflicts were negatively correlated with team performance (e.g. De Dreu and Weingart 2003; de Wit et al. 2012). Indeed, *relationship conflicts* can reduce team members' ability to evaluate and process information provided by teammates and make them less receptive to their colleagues' ideas. In addition, spending time and energy overcoming disagreements related to interpersonal incompatibility mean that this time and energy are not dedicated to the taskwork required to reach the team's goal (Jehn and Bendersky 2003). *Task conflicts* can negatively affect team performance because they increase team members' cognitive load, monopolize cognitive resources, and draw these resources away from the taskwork needed to reach the team's objective (De Dreu and Weingart 2003). Such a situation is especially likely to prevail in the case of the complex taskwork executed by ITP cross-functional teams. Therefore:

H1: *Perceived task conflict will negatively influence the IT project team performance.*
H2: *Perceived relationship conflict will negatively influence IT the project team performance.*

3.2 Functional background diversity and team performance (H3)

One recurring question emerges when one wishes to staff the best possible ITP team: what expertise is needed to get the job done? The answer to this question is likely to depend on the project's context and the nature of the team's taskwork. As ITPs usually require complex, unstructured and dynamic taskwork, ITP teams are composed of cross-functional members with complementary and diverse knowledge, expertise and experience. ITP cross-functional teams are likely to have access to diversified pool of knowledge and expertise, a larger set of perspectives, and an extended potential network of complementary information and resources (Klein et al. 2002). Since a team member's functional background captures its knowledge, expertise and experience, it can be expected that the greater the FBD is in a project team, the more expertise, experience, and knowledge the team has (van Knippenberg and Schippers 2007; Williams and O'Reilly 1998). Thus, a team composed of members with diverse functional backgrounds will be able to bring multiple information sources and varied expertise to bear on the challenges and problems it faces. In an ITP cross-functional team, FBD is likely to be beneficial because it gives its members access to a broader range of task-relevant perspectives and expertise needed to develop and/or implement an IT (Jiang and Klein 2014; Kane et al. 2019). Since ITPs require team members to collaborate, coordinate and share information very intensively, FBD is likely to be relevant for their taskwork (Ghobadi 2015). Therefore:

H3*: Functional background diversity will positively influence the project team performance.*

3.3 Moderating effects of functional background diversity (H4a/H4b)

Diversity attributes can increase a team's cognitive resource base (Joshi and Roh 2009). However, such diversity can also affect social interactions within a team (van Knippenberg et al. 2004). Since team diversity matters to teams' processes and performance, the moment and the way diversity will affect a team's dynamics and outcomes, should depend on the nature of the diversity attribute

(Mathieu et al. 2017). When looking at the cumulative findings in the literature, diversity in teams has produced inconsistent results (van Dijk et al. 2017). Some studies have explored the direct effects of diversity attributes on teams' outcomes (e.g. Horwitz and Horwitz 2007) but, as concluded by Joshi and Roh (2009), "the direct effect of diversity on performance is essentially zero" (p. 618). Other scholars have suggested examining the mediating effects of different team processes on the relationship between diversity and project team outcomes (e.g. van Knippenberg and Schippers 2007), but the results have also been inconsistent (Bell et al. 2011; Horwitz and Horwitz 2007). Yet, scholars view diversity as a key ingredient for creation and innovation (Ghobadi 2015; van Dijk et al. 2017).

Another way to examine the possible effect of diversity attributes in teams, is to look at how these attributes might amplify or temper the effect of team processes on team outcomes. The mediation perspective assumes that diversity attributes trigger team processes and that team processes then affect performance. For this situation to happen, team members must first observe and evaluate the other members' diversity attributes before engaging into the team processes that operates through social interactions (Marks et al. 2001). Such observations and evaluations can only be done based on readily-detected diversity attributes rather than underlying ones. Indeed, differences regarding underlying diversity attributes are revealed during social interactions, i.e., when team members interact with one another via team processes (Zellmer-Bruhn et al. 2008).

It is through these social interactions that members will grasp and evaluate the underlying diversity attributes of other team members. It is through these team processes that the effects of the underlying diversity attributes will emerge, take shape and become reality for the team members (Zellmer-Bruhn et al. 2008). Thus, the effects of the underlying diversity attributes may take time to emerge in project teams since several rounds of interactions may be necessary before members can observe and evaluate these underlying diversity attributes. It is likely that it is the readily detected diversity attributes rather than the underlying ones that will activate and affects team processes (e.g. intragroup conflict). Yet, since underlying attributes might take several rounds of interactions before emerging, chances are that, it is through social interactions, that the effects of underlying diversity attributes will manifest. Consequently, likelihoods are that it is during the social interactions, that underlying diversity attributes, such as FBD, may amplify or temper the effects of team processes on a team's outcomes.

Furthermore, Maloney et al. (2016) argued that context-relevant team characteristics can "moderate the task conflict — performance relationship" (p. 914). FBD can possibly fuel tensions within a team and amplify or temper disagreements (Jehn and Greer 2013). It can also amplify differences, real or perceived, in the understanding and interpretation of various problems and challenges faced by team members during ITP. Consistent with this view, Bunderson (2003) observed that FBD can increase communication and information sharing difficulties between team members, and affect teams' social interactions. Moreover, a high level of FBD within a team is likely to engender representational gaps, which consist in "differences between team members' problem definitions that will ultimately affect group problem solving" (Cronin and Weingart 2007, p. 762). Representational gaps affect how team members execute taskwork because they increase misunderstandings, lead to information misuse as well as weaken coordination between team members. Therefore:

***H4a**: Functional background diversity will amplify the negative effects of perceived task conflict on the project team performance.*

Self-categorization theory suggests that individuals validate their social identity by favoring their own social group to the detriment of social groups to which they do not belong. This categorization is determined by individuals' evaluations and characterizations of others based on diversity attributes (Hogg and Terry 2000). Thus, it should be easier for ITP team members with similar functional backgrounds to relate to one another and work together than for team members who have different functional backgrounds. Members with similar functional backgrounds are likely to identify with one another and to trust one another more. Further, prominent within-team differences in work-related social categories, such as FBD, might also create intergroup bias between members, reducing trust and creating or amplifying relationship conflicts (van Knippenberg et al. 2004). Functional background can also be a source of referent power that shapes status structures within teams (Cronin et al. 2011). The status structures engendered by FBD can affect a team's dynamic by triggering jealousy, animosity, and tension between teammates as well as by intensifying nascent or existing interpersonal incompatibility (Bunderson 2003; Jehn and Greer 2013). Therefore:

***H4b**: Functional background diversity will amplify the negative effects of perceived relationship conflict on the project team performance.*

4 Methodology

The study's target population was comprised of individuals that had worked in ITP cross-functional teams. Only the data gathered from complete ITP teams was considered (i.e., all team members had to complete and return the questionnaire to be included in the study's results). This criterion was essential to measure the team's actual diversity rather than perceived diversity (Harrison and Klein 2007). Questionnaires were sent to 307 members of 60 ITP cross-functional teams that were identified from a list of the 500 largest organizations in Canada. To minimize recall bias, our sample included only ITPs that had been completed less than one year ago at the time of our call (Burton-Jones 2009).

To fit a multilevel perspective, the study's constructs were conceptualized and measured at their respective levels of analysis. A questionnaire was developed using and adapting existing measures for the main constructs: *functional background diversity, perceived task conflict, perceived relationship conflict* and *team performance* (Bunderson 2003; Joshi and Roh 2009; Pelled et al. 1999). Factors related to the team and the taskwork were included as control variables: *project team longevity,* measured in months, and *task routineness* (Pelled et al. 1999). Based on the recommendation to be mindful to teams' contexts (Maloney et al. 2016), teams' managers were asked to characterize the ITP's *organizational sector* (private or public), the main *type of ITP* (development or implementation), and the *type of leadership* (whether managed by an organization's insider or external consultant).

Several scholars have urged diversity researchers to clearly specify how they conceptualize diversity in their studies and to use the appropriate operationalizations accordingly (e.g., van Knippenberg and Schippers 2007). Following Harrison and Klein's (2007) guidelines, FBD was conceptualized as variety, that is, in terms of categorical differences among team members wherein the number of categories represented contributes to team diversity. Harrison and Klein (2007) further specified which operationalization to use with each diversity type to ensure alignment between the conceptual and methodological aspects. A bias-corrected formula of Harrison and Klein's (2007) recommended operationalizing—the bias-corrected Blau's index proposed by Biemann and Kearney (2010) —was used to prevent the possibility of systematic bias and avoid generating erroneous conclusions (Biemann and Kearney 2010, p. 582). The data was analyzed with SAS version 9.2 and its PROC MIXED procedure for hierarchical linear modelling (Raudenbush and Bryk 2002). Of the 307 questionnaires that were sent, 248 were returned (81%). Participation was voluntary. It was the number of "complete" ITP teams that counted, rather than the response rate; 41 of the 60 ITP teams that had been contacted were complete, which corresponds to 200 of the 248 returned questionnaires. The mean team size was 5.1 members, which compares favorably with other diversity studies (Joshi and Roh 2009).

5 Results

Since each respondent was nested within a cross-functional team, the collected data created a hierarchical structure. Therefore, data was analyzed using hierarchical linear modelling, which considers the dependence of clustered data and enables the test of cross-level interactions. The study hypotheses entail two-way interactions between individual-level variables (i.e., perceived task and relationship conflicts) and group-level variables (i.e., FBD). First, we ran an empty model, that is, a model without team- or individual-level predictors of project team performance and with a random effect to capture team membership. The intraclass correlation for project team performance was .356, which suggests that performance assessments within teams were considerably clustered, and that an ordinary least squares approach would yield to misleading results (Raudenbush and Bryk 2002). Second, we ran a full hierarchical model with project team performance as the dependent variable influenced by (a) perceived task conflict and perceived relationship conflict, (b) a group-level index of FBD, (c) interactions between individual-level variables and the group-level index of FBD, and (d) individual- and group-level control variables. To facilitate interpretation, all continuous independent variables were centered. Perceived task conflict and perceived relationship conflict were highly correlated ($r = .67$), but the other bivariate correlations were low or moderate. Further inquiry showed that all variance inflation factors were below 5, alleviating the risk of multicollinearity. Finally, Cronbach alphas indicated adequate construct reliabilities: .86 for project team performance, .87 for perceived task conflict, .82 for perceived relationship conflict, and .87 for task routineness.

As can be seen in Table 1, perceived task conflict was significantly and negatively linked to project team performance (Beta = -0.31, SE = 0.07 $p < 0.001$), ***supporting H1***. However, neither perceived relationship conflict (H2) nor FBD (H3) had a significant effect on project team performance (Betas = 0.02 and 0.18, SEs = 0.07 and 0.28, p's > 0.10, respectively), meaning that ***H2 and H3 were not supported***. In terms of the interaction effects, the results displayed in Table 1 show that FBD

significantly amplified the detrimental influence of perceived task conflict on project team performance (Beta = -0.33, SE = 0.14, $p < 0.05$)[1]. However, it did not influence the effect of perceived relationship conflict on project team performance (Beta = 0.06, SE = 0.11, $p > 0.10$). Thus, ***H4a was supported***, whereas ***H4b was not***. Team longevity and task routineness did not significantly influence project team performance. Finally, it is important to note that none of the other diversity attributes had a significant effect on project team performance[2].

	Model without interaction		**Model with Interaction**	
Effect	Estimate	(SE)	Estimate	(SE)
Intercept	−.14	(.40)	−.25	(.39)
Individual level variables				
Perceived task conflict (A)	**−.33**	**(.07)** ***	**−.31**	**(.07)** ***
Perceived relationship conflict (B)	0.2	(.28)	.02	(.07)
Team level variable				
Functional background diversity (C)	.17	(.28)	.18	(.28)
Interactions				
A x C	—		**−.33**	**(.14)** *
B x C	—		.06	(.11)
Control Variables – Individual level				
Age	.01	(.01)	.01	(.01)
Education level (college or less)	.42	(.30)	.53	(.30)
Education level (undergraduate)	.32	(.29)	.44	(.29)
Gender	.31	(.21)	.34	(.21)
IT training	−.23	(.21)	−.30	(.21)
Control Variables – Team level				
Project sector (private sector)	−.08	(.30)	−.05	(.29)
Project lead (internal leadership)	−.27	(.30)	−.11	(.30)
Project team longevity	.016	(.01)	.017	(.01)
Project type (development project)	.18	(.30)	.06	(.29)
Task routineness	−.05	(.05)	−.07	(.05)

*p < .05, **p < .01, ***p < .001 (unilateral)

Table 1. Explanation of Project team performance

Figure 2 illustrates the interaction effect by showing the relationship between perceived task conflict and project team performance for values one standard deviation below and one standard deviation above the mean for FBD (SD = .45). The negative slope representing the data of teams with high FBD is more pronounced than that of teams with low FBD, which reflects the finding that the negative effect of perceived task conflict on project team performance is amplified by FBD. In other words, when the level of perceived task conflict is low, teams with high FBD perform better than teams with low FBD, but when the levels of perceived task conflict is high, the opposite happens: teams with low FBD perform better than those with high FBD.

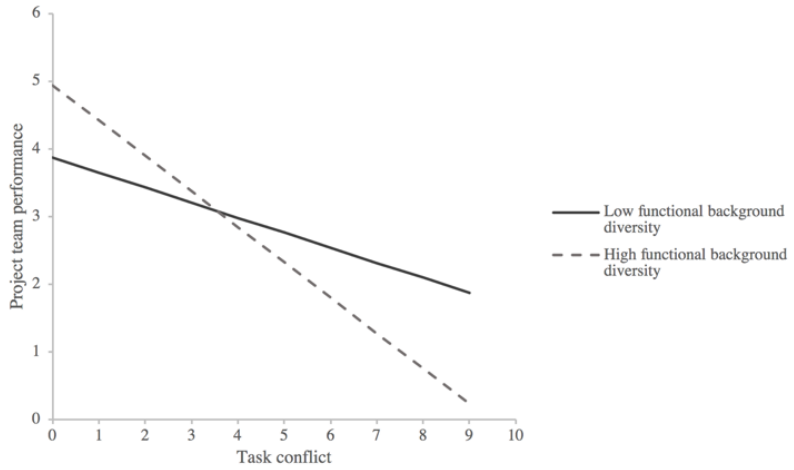

Figure 2: Interaction effect of FBD and task conflict on team performance

[1] To assess the possibility of mediation between FBD and perceived conflicts, tests were carried out. Direct effects (i.e. FBD → perceived task or relationship conflicts) were tested and the results were not significant. Details are not presented due to space limitations but could be provided on demand.

[2] These results are not reported here due to space limitations but could be provided on demand.

6 Discussion

6.1 Research contributions

A key theoretical contribution of the present study stems from the evidence it provides in support of the propositions that team diversity: 1) do not necessarily directly affect team performance or is mediated by team processes but rather can moderate the effects of team processes on team performance, 2) has multilevel effects, and 3) can have potentially different effects depending on the context of a study, as well as on how it is conceptualized and operationalized. Regarding H1, we had anticipated a negative effect of perceived task conflict on team performance, and the study's results supported this hypothesis, which corroborate the findings of several previous studies (De Dreu and Weingart 2003; de Wit et al. 2012). Thus, we have shown that, in ITP cross-functional teams, perceived task conflict can interfere with project team performance, rather than improve it regardless of the level of FBD (Jehn 1994; Jehn 1995; Jehn 1997) [3].

Second, our study contributes to the understanding of the link between perceived relationship conflict and team performance as the results show no support for the anticipated negative effect (H2). According to the information/decision-making perspective of the effects of team diversity (van Dijk et al. 2017), relationship conflicts should limit a team's ability to process information because most of the members' time and attention would be focused on interpersonal issues rather than on the taskwork. The nonsignificant result may follow from the fact that relationship conflicts might be more disruptive to proximal group outcomes (e.g., trust, satisfaction, commitment) than to distal group outcomes (e.g., team performance) (de Wit et al. 2012). Another explanation could be that team members experienced relationship conflicts as micro-conflicts, that is, conflicts that are easily and quickly resolved and do not escalate enough to affect the team's performance (Paletz et al. 2011). Yet another possible explanation could stem from the possibility of reverse causality: team performance could induce perceived relationship conflicts, because poor performance can create tension, frustration and stress. All of these explanations provide theoretical justification for H2 non-significant results, but each explanation would deserve to be empirically investigated in the future.

Third, our study also observed no significant relationship between FBD and project team performance (H3). The non-significant result may follow from the fact that it can be challenging for ITP team members to get to know the exact functional background of their teammates when they get assigned to a project team since FBD is an underlying diversity attribute. Indeed, team members need to have social interactions and to interact with other team members to have a reliable appreciation of their functional background. Underlying diversity attributes, such as FBD, usually requires more time and effort to appraise compared to more readily detectable diversity attributes. Thus, since underlying diversity attributes are revealed during social interactions, chances are that this type of diversity attributes affects first, proximal team variables, such as teams' mediators (e.g. team processes) (Ilgen et al. 2005), rather than affecting more distal variables such as team performance.

Fourth, our study shows that FBD amplifies the negative effects of perceived task conflict on project team performance (H4a). This finding is in line with the observations of Jehn and Bendersky (2003), who suggested that team diversity be considered as a *moderator* between conflict and team performance rather than a *mediator* (e.g., Jehn et al. 1999). According to these scholars, diverse characteristics among team members can amplify the effects of perceived conflicts by adding a layer of animosity and misunderstanding between team members. FBD can also possibly intensify the representational gaps within an ITP team and stimulate task conflicts (Cronin and Weingart 2007). Indeed, as a team's FBD increases, key task-related disagreements like those about the definition or understanding of the problems to be solved are also likely to increase, negatively affecting coordination and the effectiveness with which team members solve problems. Thus, representational gaps, fueled by FBD, are likely to amplify taskwork disagreements and ultimately affect the team's performance.

Finally, the study found no support in favour of the interaction effect of FBD and perceived relationship conflict on project team performance (H4b). This result may stem from the fact that relationship-oriented diversity attributes (e.g. gender, age), rather than task-oriented attributes (e.g., tenure, functional background), may affect perceived relationship conflict (Jehn 1995; Jehn et al. 1999). Indeed, since relationship conflicts involve non-work-related issues and that FBD is a task-oriented (i.e. work-related) diversity attribute, it is possible that FBD and perceived relationship

[3] We have tested for a possible curvilinear relationship between perceived task conflict and team performance, i.e. task conflict could have a positive effect up to a certain level, at which point it becomes negative. Results were not significant.

conflicts are unrelated in cross-functional project teams. Thus, in ITP teams, it is possible that FBD and perceived relationship conflicts might not interact to affect the team's performance. Another possible explanation is that diversity within a team can help team members "protect" themselves from perceived relationship conflicts so that the negative effects of perceived relationships conflicts on team performance are mitigated by team diversity. Indeed, since perceived relationship conflicts are affective disagreements that arise from perceived interpersonal incompatibility, team members may "protect" themselves by turning to and working with team members from their "ingroup," with whom they are compatible (Hogg and Terry 2000). By interacting with members from their ingroup they can minimize the possibility of experiencing relationship conflicts. Finally, since ITP teams are assembled for relatively short periods of time, members may have a limited time to develop long-term interpersonal relationships; as a result, perceived task conflict may be overall more prevalent than perceived relationship conflict.

6.2 Practical contributions

Selecting individuals to form an effective project team can be very challenging, especially for cross-functional teams. Thus, when dealing with teams working in a complex context, team managers who want to minimize the possible negative effects of FBD while capitalizing on the potential benefits of diversity should try to implement pro-diversity culture (e.g., openness, respect, empowering) and minimize disagreements between team members regarding taskwork. It is crucial that team managers focus on what their team do and how the diverse knowledge and expertise is used and shared rather than focusing on the knowledge and expertise they possess (Edmondson and Harvey 2017). Team managers should favour socialization between team members to increase mutual understanding, clarify team members' roles, reduce representational gaps, develop a sense of belonging, and reduce uncertainty. They should also favour the establishment of a common vocabulary to facilitate knowledge transfer and minimize misunderstandings. Team managers should help developing a team mental model, i.e. a shared understanding about the taskwork and team processes (Klimoski and Mohammed 1994), to minimize possible work-related disagreements. Finally, team managers should encourage reflexivity, i.e., the extent to which teams reflect upon and modify their functioning, to promote a better understanding of the task outcomes and their interdependencies (Schippers et al. 2003). It may be very difficult, even impossible, to completely avoid conflicts within teams. However, teaching team members how to constructively manage conflicts and informing them of the potential benefits of team diversity could help create working environments infused with more openness, psychological safety, and trust—all key ingredients to team performance (Edmondson and Harvey 2017).

This study has some limitations that should be acknowledged. First, the cross-sectional nature of the data limits our ability to explore how interactions between team diversity, conflicts, and team performance may change over the life cycle of an ITP. It also limits our capacity to predict causal relationships. In this context, no definite conclusion can be reached regarding the nature of causality; yet, it is plausible that, overtime, the relationships between the study variables may be reciprocal. Also, as the study sample consisted of relatively small ITP teams, there is the possibility that the results may not apply to larger teams, which can be viewed as a limitation (Stewart 2006). In addition, while project team performance is considered to be a key element of team effectiveness, the present study examined only one dependent variable without considering other possible such as, for instance, satisfaction or commitment (Mathieu et al. 2008).

7 Conclusion

This study is one of the first to examine the moderating effects of diversity on the relationship between intragroup conflicts and team performance (Jehn and Bendersky 2003). In the context of ITP teams, the study shows that FBD plays a moderating rather than a mediating role in the relation between intragroup conflicts and team performance. More specifically, FBD amplifies the negative effects of perceived task conflicts on a team's performance but does not affect the effect of perceived relationship conflicts. The results support the idea that the effects of diversity can vary depending on the nature of the diversity attribute(s) studied, the team's contexts and taskwork, as well as how diversity is conceptualized and operationalized.

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