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The role of functional and demographic diversity on new product creativity and the moderating impact of project uncertainty

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ABSTRACT

Earlier studies have shown inconsistency in the impact of team diversity on the effective functioning of New Product Development (NPD) teams. This inconsistency has been attributed to the insufficient amount of research on a possible complex (non-monotonic) relationship between team diversity and team performance and the possible boundary conditions of this relationship. Addressing numerous calls for future studies on these issues, we examined whether an inverted-U relationship exists between team diversity (i.e., functional and demographic) and its outcomes (i.e., new product creativity), using project uncertainty as a key moderator. The results of an empirical study with a sample of 103 new product development teams showed an inverted U-shaped functional diversity–new product creativity relationship. Moreover, the results showed that the direct relationship between functional diversity and new product creativity was stronger when project uncertainty was high as opposed to when it was low. On the other hand, the direct relationship between demographic diversity and new product creativity was weaker when project uncertainty was high as opposed to when it was low.

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1. Introduction

In this paper, we focus on the relationship between the diversity of new product development teams and new product creativity. In one of the most common categorizations of team diversity, past research has primarily focused on two types of diversity, including social category diversity and informational/functional diversity (van Knippenberg, De Drue, & Homan, 2004). While research on social category diversity deals with differences on such readily identifiable attributes of team members as sex, age, and ethnicity, research on informational/functional diversity deals with their differences in less visible underlying attributes such as functional and educational background (Bantel & Jackson, 1989; Østergaard, Timmermans, & Kristinsson, 2011).

The impact of team diversity on the effective functioning of new product development (NPD) teams has been extensively investigated in the product innovation literature (Andersen, Kragh, & Letti, 2013; Crawford & Di Benedetto, 2006; Dayan & Di Benedetto, 2010; Hirunyawipada, Beyerlein, & Blankson, 2010; Mohd Zaki & Othman, 2013; Suh, Bae, Zhao, Kim, & Arnold, 2010; Tsai & Hsu, 2014). However, while such prior studies recognize the influence of team diversity on new product creativity (e.g., Crawford & Di Benedetto, 2006), few

studies provide empirical validation of how the diversity would lead to new product creativity at the NPD team level. Furthermore, this literature suggests a complex relationship between team diversity and team creativity (e.g., Dayan & Di Benedetto, 2011). More importantly, past research offers inconsistent results. For example, while several researchers (e.g. Gino, Argote, Miron-Spektor, & Todorova, 2010; Keller, 2001) have argued that diversity would be beneficial due to the broader range of knowledge and expertise brought by functionally diverse team members, others (Joshi & Roh, 2009; Van der Vegt & Bunderson, 2005) have suggested that diversity would be detrimental because people's preference for interacting and collaborating with similar rather than dissimilar participants could make communication difficult and cause conflicts and mistrust.

This inconsistency in the literature has usually been attributed to the insufficient amount of research on the direct relationship between team diversity and team performance and the possible boundary conditions of this relationship. Thus, researchers have suggested that future research should investigate the direct relationship between team diversity and team performance, and the boundary conditions of this relationship (e.g., Harrison & Klein, 2007). Past research has used such moderators as temporal team leadership (Mohammed & Nadkarni, 2011), social status category (Chattopadhyay, Finn, & Ashkanasy, 2010), need for cognition (Kearney, Gebert, & Voelpel, 2009), national power distance (Van der Vegt, Van de Vliert, & Huang, 2005), and job stress (Keller, 2001). However, although meta-analyses (Bell & Berry, 2007; Stewart, 2006) have revealed it to be an important potential moderator, the role of task characteristics (e.g., project uncertainty) in

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the diversity–performance relationship has not been fully examined, especially given that the role of uncertain tasks in smoothing group interactions is widely recognized (Carbonell & Rodriguez-Escudero, 2013). Because the effect of diversity source on new product creativity will likely differ when the project being worked on is non-routine or uncertain and requires new ways of thinking, we test the moderating role of project uncertainty in the diversity–new product creativity relationship.

Considering all the inconsistent findings and different perspectives on the diversity–performance relationship in the general team-diversity literature and addressing the need to provide empirical validation of how the diversity would lead to new product creativity within the specific context of NPD teams, this study aims to contribute to the literature in four ways. First, following the suggestions of past research that called for diversity research taking a multi-domain perspective (Van Knippenberg et al., 2004), it analyzes the role of both social category diversity (i.e. demographic diversity) and informational/functional diversity on the diversity–new product creativity relationship. Second, it investigates if the role of project uncertainty as a moderator on this relationship would differ between these two types of diversity. Third, this study aims to advance our understanding of the relationship between team diversity and performance by considering a potential curvilinear relationship between diversity and new product creativity that would be another reason for the inconsistency. Fourth, it examines project uncertainty as a key moderator of the relationship between diversity and new product creativity, thus filling a major research gap in the current literature.

2. Conceptual background and hypotheses

Team diversity is defined as differences among the participants in a team setting on a shared attribute that may lead to the view that another person is not the same as oneself (e.g., Williams & O'Reilly, 1998). Researchers have made a common distinction in the extant literature, in an effort to organize various types of diversity, ranging from age to sex and from functional background to educational background, and to understand the impact of all of these different types of diversities on performance. This distinction suggests that the most significant difference underlying diversity dimensions is between diversity on readily detectable/observable attributes—differences in, for instance, sex, age, and ethnicity—and diversity with respect to less visible attributes that are mainly job related—differences in, for instance, functional and educational background (Milliken & Martins, 1996; Tsui, Egan, & O'Reilly, 1992). The main reasoning behind this categorization is that when differences among participants are easily detectable, they predominantly evoke a response founded on biases or stereotypes. Thus, based on this categorization several researchers have argued that the impact of diversity on performance can better be understood by considering both the information/decision-making perspective, which assumes that diversity would be beneficial due to the wider range of task-relevant resources brought by dissimilar participants, and the social categorization perspective, which assumes that diversity would be detrimental to the effective functioning of teams due to people's preference for interacting and collaborating with similar rather than dissimilar participants. Furthermore, past research proposes that while the detrimental effects of diversity should be more likely to be observed for readily detectable/observable attributes than for less visible attributes the positive effects of diversity are more related to less visible attributes (e.g. Milliken & Martins, 1996). Hence, it is argued that diversity has positive effects on performance as long as it leads to informational differences (e.g. Van Knippenberg et al., 2004). Indeed, it has been proposed that although readily detectable/observable attributes, such as demographic differences (sex, age, and ethnicity), may be associated with such informational differences (Cox, Lobel, & McLeod, 1991; Tsui & O'Reilly, 1989), less visible attributes, such as functional background, are more likely to be associated with informational differences (Pelled,

Ledford, & Mohrman, 1999). For instance,¹ one may argue that while functional backgrounds also represent identity, for example, an R&D person would identify with R&D and a marketing person will identify with marketing, demographic backgrounds can also be argued to represent different knowledge, for example a younger person and an older person would have different knowledge. Although functional and demographic diversities are both related to knowledge and identity, functional knowledge represents more knowledge than identity demographic diversity represents more identity than knowledge. Indeed, past research suggests that while demographic differences could be associated with such informational differences (Cox et al., 1991; Tsui & O'Reilly, 1989), less visible attributes are more likely to be related to informational differences (Pelled et al., 1999). Consequently, we argue that the positive effects of team diversity would be more likely to occur for diversity on less visible attributes.

Even though the theoretical arguments for this reasoning made in the extant literature are well grounded, the empirical findings on the proposition that the impact of diversity is conditional on diversity type (i.e., the information/decision-making perspective vs. the social categorization perspective) have been inconsistent. Past research showed that neither diversity on readily observable attributes nor diversity on job-related attributes is consistently linked to team performance. In general, past research has shown that diversity is a double-edged sword because it may not only contribute to the rise in diverse ideas, perspectives, and knowledge that can increase new product creativity (e.g. Im & Workman, 2004, Jehn, Northcraft, & Neale, 1999), but may also have a disruptive effect on group processes and performance (for reviews, see Milliken & Martins, 1996). For instance, while Cox et al. (1991) discovered a positive effect of diversity with regard to readily observable attributes (i.e. demographic differences) on cooperative behaviors in teams, Simons, Pelled, and Smith (1999) found a negative effect of job-related diversity in top management teams on performance.

Given this inconsistent pattern of results on the diversity–performance relationship, recent research has begun to investigate contextual moderators and mediators to understand how and when diversity might lead to better performance. In this recent research, the role of temporal team leadership (Mohammed & Nadkarni, 2011), social status category (Chattopadhyay et al., 2010), need for cognition (Kearney et al., 2009), national power distance (Van der Vegt et al., 2005), and job stress (Keller, 2001) in the diversity–performance relationship has been widely explored. However, although meta-analyses (Bell & Berry, 2007; Stewart, 2006) have revealed that diversity is more likely to lead to better performance in a non-routine task environment, the role of task characteristics (e.g., project uncertainty) in the diversity–performance relationship has not been carefully examined.

In this study, we propose that project uncertainty may influence—that is, act as a moderator with respect to—whether either functional diversity or demographic diversity or both have beneficial or detrimental effects on new product creativity. Our argument on this possible relationship is based on the assumption that diversity source may provide a basis for improved group effectiveness and performance when the project being worked on is non-routine or uncertain and requires new ways of thinking (Kearney et al., 2009). More specifically, past research on the information/decision-making perspective assumes that functional diversity, defined as the extent to which team members differ in their functional backgrounds, would have a positive impact on new product creativity when the project is complex and requires creative problem solving (Amabile, 1988). In the extant literature, several underlying assumptions have been made on the positive moderating effect of task complexity on the functional diversity–new product creativity relationship. For instance, Carbonell and Rodriguez-Escudero (2013) argue that unlike certain tasks, uncertain tasks (e.g., radical product innovation) oblige more elaborate information processing

¹ We would like to thank an anonymous reviewer for this example.

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