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Diversity's harvest: Interactions of diversity sources and communication technology on creative group performance

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ABSTRACT

Our research is based on arguments that three different diversity sources in groups – agreeableness, openness, and ethnicity – might simultaneously possess separation properties that result in social categorization and variety properties that provide non-redundant and value-adding information resources. To help understand how these diversity sources interact with the additive and reductive features of communication technology to impact group creativity, we designed two studies involving computer mediation, nominal group technique, and face-to-face (control) communication. Our findings suggest that agreeableness, openness, and ethic diversity possess both negative separation and positive variety properties. Whereas the separation properties of all three diversity sources, as well as the variety properties of openness diversity, are evident in newly-formed groups, the variety properties of agreeableness and ethnic diversity are only manifest in mature groups. Finally, the additive and reductive features of communication technology interact with all three diversity sources to impact creative group performance in different ways.

Introduction

In recent years, several interesting developments in the field of group diversity research have enriched the literature. Among these are investigations of the complex nature of diversity and its relationship to group processes and outcomes over time (e.g., Harrison, Price, Gavin, & Florey, 2002; Watson, Kumar, & Michaelsen, 1993; Zellmer-Bruhn, Maloney, Bhappu, & Salvador, 2008), research that describes communication technology interventions to facilitate diverse group performance (e.g., Carte & Chidambaram, 2004; Staples & Zhao, 2006), and studies that examine how different sources of diversity impact group outcomes, theory, and research design (e.g., Harrison & Klein, 2007; Harrison, Price, & Bell, 1998; McGrath, Berdahl, & Arrow, 1995; Van Knippenberg, De Dreu, & Homan, 2004).

Much of this progress has been motivated by the confusing results found in the group diversity literature; Milliken and Martins (1996) appropriately described diversity in groups as a "double-edged sword" when referring to these paradoxical findings. The paradox refers to the potential for diverse groups to solve complex problems requiring increased creativity, multiple perspectives, and variegated expertise (Westphal & Milton, 2000), which is offset by the fact that diverse groups often experience frustration and tension (Milliken & Martins, 1996), conflict while working on complex tasks (Jehn, Northcraft, & Neale, 1999), and low levels of satisfaction with their group experience (De Dreu & Weingart, 2003). Further inhibiting diversity's potential are ineffective communication norms, such as failure of members to actively share their own ideas, to attend to others' different perspectives, and to encourage others' participation during group discussions (Bhappu, Griffith, & Northcraft, 1997; Maznevski, 1994).

In considering different diversity sources, those easily accessible upon initial group contact (e.g., ethnicity, age, and gender) are particularly salient markers of social identity. As a result, such surface-level diversity sources (Harrison et al., 2002) often give rise to "pernicious" social categorizations (Brickson, 2000) that subvert the creative potential of diverse groups. However, the effect of surface-level diversity sources on group effectiveness decreases over time as deep-level diversity sources (e.g., functional expertise, life experience, and personality) become more influential (Harrison et al., 2002; Zellmer-Bruhn et al., 2008). Furthermore, if variety among group members (Harrison & Klein, 2007) on a given diversity source has task relevance (Van Knippenberg et al., 2004), then that diversity source may provide a basis for improved group effectiveness and performance.

Just as task and time considerations are relevant to furthering our understanding of diversity, so too is communication technology. Different communication technologies vary to the extent that

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they possess reductive or additive capabilities (Carte & Chidambaram, 2004). Reductive features essentially strip out elements of the communication environment (e.g., visual and vocal cues about ethnicity, age, and gender) that often give rise to social categorizations whereas additive features (e.g., the ability for individuals to share ideas in parallel) enhance group performance. Given that diversity in groups is a double-edged sword, the potential of communication technologies to reduce social categorization while enhancing group decision-making is of particular interest to some diversity scholars (DeSanctis & Monge, 1999).

This study was motivated by consideration of these and related findings in the literature on diversity in groups. We were particularly intrigued by the possibility that the additive and reductive features of communication technology might positively impact the effect of different diversity sources on group outcomes depending on the propensity of a given diversity source to elicit social categorizations and its relevance to the task at hand. Therefore, we conducted two studies to further explore this possibility. In Study 1, we ran a field experiment among student groups who had been working together for a semester. They performed a creative decision-making task using their choice of either computer-mediated (CMC) or face-to-face (FTF) communication. In Study 2, we further explored these findings using a larger sample, random assignment of individuals to newly-formed groups based on personality diversity, random assignment to communication-technology conditions, a third experimental condition of the nominal group technique (NGT) (Van de Ven & Delbecq, 1971), and a more complex creative, decision-making task.

Diversity sources

Harrison and Klein (2007) suggest that one way to conceptualize a diversity source is by assessing whether it possesses variety, separation, and disparity properties. Variety refers to the potential of a diversity source to reflect unique and task-relevant perspectives among group members, consistent with the law of requisite variety (Ashby, 1956) and traditional arguments for value in diversity (Hoffman, 1959; Milliken & Martins, 1996). Separation refers to the tendency of a diversity source to generate social categorizations among group members, consistent with social identity theory (Tajfel & Turner, 1986). Disparity refers to situations when a diversity source creates a minority subgroup within the larger group, consistent with theories of inequality (Blau, 1977) and minority influence (Moscovici, Lage, & Naffrechoux, 1969).

Conceptualizing diversity sources at different levels is analogous to concepts in physics, where considering diversity as an undifferentiated mass might be similar to a molecular view, examining specific sources differently (McGrath et al., 1995; Nkomo, 1995) as an atomistic view, and looking at properties within a source (Harrison & Klein, 2007) as a sub-atomic view. The latter microscopic perspective may be particularly helpful in unlocking the double-edged sword of diversity, for if a given diversity source contains two or more of these properties, its overall effect on group outcomes may be offset, resulting in frequent Type II errors. Furthermore, group outcomes related to diversity source properties of variety, separation, and disparity may vary with group development and/or time (Harrison et al., 2002; Watson et al., 1993), across tasks (Mohammed & Angell, 2003), and communication technology (Carte & Chidambaram, 2004). Therefore, studying groups in various environments may prove essential to identifying variety, separation, or disparity effects of diversity sources on group outcomes.

Harrison et al. (1998, 2002) continue a long tradition (e.g., Bouchard, 1969; Hoffman, 1959; Hoffman & Maier, 1961) of considering positive (i.e., variety) effects of personality diversity sources on group outcomes. Since the emergence of the Big Five paradigm, however, little support for such a perspective has been found (Barrick, Stewart, Neubert, & Mount, 1998; Mohammed & Angell, 2003; Neuman, Wagner, & Christiansen, 1999). A recent meta-analysis by Bell (2007) found little evidence to suggest that there is any value in personality diversity sources for group outcomes; in fact, conscientiousness diversity has been negatively associated with team performance (Barrick et al., 1998). However, Bell's (2007) meta-analysis did not differentiate among task types; therefore, task-contingent effects of personality diversity sources on group outcomes may have been overlooked. Furthermore, Bell (2007) did not distinguish between the variety, separation, and disparity effects of personality diversity sources.

Similarly, Horwitz and Horwitz (2007) conducted a meta-analysis on diversity and performance, finding some support for the value of task-relevant diversity, such as functional expertise, education, and organizational tenure, on performance quality and quantity. They, however, did not find any general support for diversity's relationship to group performance. While Horwitz and Horwitz (2007) did consider task, their moderated analysis focused on task complexity generally rather than the qualitatively different nature of various task types.

Furthermore, we believe that by distinguishing between the separation and variety properties of personality diversity sources, we may be able to better isolate their effects on group outcomes, particularly in a creative task context. Therefore, we include personality diversity sources in our investigation.

Separation properties of diversity sources

Ethnic diversity's separation properties are believed to be so pervasive that they are generally assumed rather than tested empirically, as we did in Study 1 by studying whether perceptions of diversity were correlated with actual diversity. Less obvious is our contention that personality diversity, too, can be perceived and contain separation properties.

Fundamental to our argument that personality diversity sources contain separation properties is the assumption that group members can perceive differences in their personalities when interacting with one another. Personality scholars have found that Big Five personality can be detected in others with some validity from the earliest stages of acquaintanceship (Borkenau, Mauer, Riemann, Spinath, & Angleitner, 2004; Funder & Sneed, 1993; Paulhus & Bruce, 1992), with statistically significant detection beginning and persisting within a few minutes of observing behavior. Given the bewildering array of social and other stimuli bombarding individuals during group interactions, it follows implicitly from the above findings that group members will actively assess, with some validity, others' personalities as soon as they become acquainted. Group members are motivated to bond with each other in the normal process of group development, and we know that interpersonal attraction extends well beyond surface-level diversity to include attitudes and personality (Byrne, 1971; Schneider, 1987). We are not arguing, however, that personality diversity sources will be as influential as demographic diversity sources during self and social categorization in groups. Rather, we assert that ethnic diversity, as well as agreeableness and openness diversity, are diversity sources possessing separation properties that can be detected by group members upon interaction. In other words, we are arguing that group members should perceive actual differences on these diversity sources. Therefore, we propose that:"H1: Actual agreeableness, openness, and ethnic diversity will be positively associated with perceived agreeableness, openness, and ethnic diversity, respectively, in groups."