DIVERSITY AND TEAM PERFORMANCE: A META-ANALYSIS

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Abstract

The impact of three types of diversity proposed by Harrison and Klein (2007) – separation, variety, and disparity – on team performance (quantitative performance, innovation and general performance) was tested through meta-analysis. Results showed that the effect of disparity diversity had a significant effect on innovation, but the other diversity types had no relationships with performance.

Key Words: team diversity, group heterogeneity, performance, meta-analysis
Diversity and Team Performance: A Meta-Analysis

As the world becomes more globalized, organizations continue to become more diversified employees from different ethnicities as well as educational and functional backgrounds (Milliken & Martins, 1996). According to Harrison and Klein (2007), the volume of research on diversity doubles every five years; there were only 19 studies in 1988, but 134 in 2003.

Even with the plethora of studies on diversity, results have shown that evidence for a relationship between diversity and performance is inconclusive (Harrison, Price, & Bell, 1998). Webber and Donahue (2001) argue that one of the reasons for this is that there are no firm agreements on conceptual definition among users. Also there is a lack of a theoretical framework in this literature for understanding diversity in teams and groups. Furthermore, there are no agreements on the typology of diversity.

To address this, Harrison and Klein (2007) proposed three distinctive types of diversity: separation, variety, and disparity. Harrison and Klein’s typology (2007) provides a useful theoretical framework and guidelines for diversity research, and thus I performed a meta-analysis on the relationship of diversity and performance using this theoretical framework.

Theoretical background

Definition of Teams and Diversity

Webber and Donahue (2001) use “teams” and “work groups” interchangeably and define them as “collections of individuals who are interdependent, share responsibility for outcomes, and are viewed as an intact social entity (p.143).” In this study, I also use these terms interchangeably.
Researchers use “diversity” to mean as heterogeneity or dissimilarity. Some researchers describe diversity as the characteristic of a group or of an organization that represents the degree of subjective or objective differences among people in the group (van Knippenberg & Shippers, 2007). Harrison and Klein (2007) define diversity as “the distribution of differences among the members of a unit (p.1200)” in which there is a common attribute such as age, ethnicity, or attitude. Within-unit differences can stem from differences in gender, race, age, tenure, education, functional background, marital status, values, attitudes, affect, network ties, pay, and performance (Milliken & Martins, 1996, Jehn et al., 1999, Harrison & Klein, 2007, van Knippenberg & Shippers, 2007). Thus, the variation in attributes among members in groups creates diversity.

**Typology of Diversity**

Different authors delineate different dimensions of diversity. For example, Jehn et al (1999) classified diversity in three categories: social (e.g., race), value diversity, and informational diversity. Milliken and Martin (1996) presented two types of diversity, observable and nonobservable diversity. When differences are salient, diversity is likely to provoke responses that are due to bias. Pelled (1996) distinguished diversity in terms of the degree of job-relatedness and visibility.

**The Relationship between Diversity and Outcome variables**

Relationship between diversity and performance is inconclusive. Bantel and Jackson (1989) showed the positive effects of demographic (social) diversity on problem solving whereas O’Reilly et al. (1989) found that demographic diversity was positively related to turnover. Simons et al. (1999) found negative effects of informational diversity. Bunderson and Sutcliffe (2002) examined the effects of dominant functional (informational) diversity and intrapersonal
functional diversity (the aggregate functional breadth of team members) and found that informational diversity is negatively related to information sharing and group performance whereas intrapersonal functional diversity is positively related to information sharing and group performance. Webber and Donahue (2001) followed Pelled (1996)’s classification and performed a meta-analysis on two types of diversity. They found no reliable relationships for either highly job-related or less job-related diversity with group performance.

**Harrison and Klein’s Within-Unit Diversity Types**

Harrison and Klein (2007) urge that the construct of diversity needs to be closely examined and refined. They argue that researchers reach ambiguous conclusions (or inconsistent results) without considering each type of underlying assumptions and characteristics and provide three distinctive types of diversity.

Harrison and Klein (2007) provided a diversity typology that consisted of separation, variety and disparity. They gave an example of eight members each in three teams. Members of S team (separation) have different attitudes toward a certain research paradigm. Four members are prone to qualitative research and the other half to quantitative research. Members of V team (variety) have different educational backgrounds. Members are from different departments (finance, economics, biology or management). Members of D team (disparity) have different ranks. For example, one of the members might be a renowned professor and some members can be first year research assistants.

Figure 1 below illustrates “Types and Amounts of Three Meanings of Within-Unit Diversity”.

Figure 1 Inserted about Here
Separation. Members differ along a continuous attribute in the separation type of diversity. An attribute of this type can be a value, belief, or attitude regarding team goals and processes. The researchers predict reduced cohesiveness due to the conflict that diversity brings and eventually this leads to distrust and decreased task performance. Foundational theories for separation diversity are similarity/attraction, social categorization, and attraction, selection and attrition (ASA) (Byrne, 1971, Tajfel, 1981, Schneider & Goldstein, 1995).

Brewer (1979) examined the effects of in-group and out-group on group outcomes. The difference in trait affects the salience of distinctions between in-group and out-group. There was increased favoritism toward in-group members whereas there was hostility toward out-group members. Sigal et al. (2000) examined the fit in trait positive affect between CEO and team members. A similar trait positive affect fit is related to positive outcomes in decision-making and financial performance. Affectively diverse in trait brings greater task and emotional conflict. Thus,

**H1: The separation type of diversity will have a negative relationship with performance.**

Variety. Variety type of diversity focuses on qualitative differences in members. Minimum variety occurs when all members are from the same category. Maximum variety means that all members are from distinct fields or different educational (functional) backgrounds.

The theoretical background for variety is information process theory (Hinsz et al., 1997) and cognition theory (Campbell, 1960, cited in Harrison & Klein, 2007). Members are from different pools of informational resources, and heterogeneity creates greater information richness and creativity. Thus, the predicted outcomes in variety are greater innovation, higher decision quality and increased flexibility.
Argote and Ingram (2000) argue that interactions with people who have different tacit knowledge are the source of competitiveness in firms. Hambrick et al. (1996) state that the overall effects of diversity on performance are positive in their study even though heterogeneous top management teams are slower in actions and responses. Smith et al. (1994) found that team heterogeneity in the years of education had a positive direct relationship with performance. Gibson and Vermeulen (2003) collected data from 156 teams in five pharmaceutical and medical product firms and found that heterogeneous teams were likely to engage in learning. Thus,

**H2: The variety type of diversity will have a positive relationship with performance.**

**Disparity.** Harrison and Klein (2007) state that disparity is found more common in sociology literature than organizational literature. The assumption of the disparity type of diversity is that members in groups have different levels of attributes such as pay, power, prestige and status. Minimum disparity means that each member has the same position and maximum disparity occurs when socially valued resources are relatively concentrated in one or two members.

Disparity is based on theories of deprivation (Deutsch, 1985, cited in Harrison & Klein, 2007) and tournament compensation (Lazear & Rosen, 1981). The predicted outcomes are more competition among members and resentful deviance and withdrawal. Disparity also might suppress creativity. In organizational literature, pay dispersion is the clearest example of disparity.

Bloom (1999) conducted interesting studies on pay dispersion of baseball players and found that more compressed pay dispersions are positively associated with organizational
performance. Pfeffer and Langton (1993) collected from 1,805 academic departments in 303 universities and found that more participative department governance was related to a more equal salary distribution whereas a greater tendency to work alone was associated with more disperse salary distribution. Siegel and Hambrick (2005) examined the effects of top management group pay disparity on firm performance. They found that collaboration among group members is negatively associated with larger pay disparities. Thus, disparity fosters competition among members, reduces cooperation and promotes resentful behaviors or attitudes.

**H3:** The disparity type of diversity will have a negative relationship with performance.

**Method**

**Literature Search**

A literature search was conducted to identify published reports that examined the relationship between diversity and performance. The articles were identified through several methods, including electronic searches of the PsychINFO (1887–2007) database. To be inclusive, I conducted a broad search using the keywords group diversity, team diversity, team composition, heterogeneity, dispersion, dissimilarity, disagreement, inequality, homogeneity, agreement, consensus, convergence, and equality, social categorization, and information processing.

The electronic search was supplemented with a manual search of reference lists of key empirical and theoretical articles as well as reference sections from prior meta-analyses and chapters on team. In addition, I conducted a manual search for in-press articles at the *Journal of Applied Psychology, Academy of Management Journal, Administrative Science Quarterly,*
Inclusion Criteria

The abstracts obtained from the electronic search were reviewed for appropriate content and considered for inclusion in the meta-analysis. Studies were included if they involved the summarization of data and had the relevant correlations, the number of samples and reliabilities of independent and dependent variables to compute the effect size. In sum, a total of 144 correlations from 42 articles were included in this study.

Variables include in the analysis

The independent variables included heterogeneity (diversity) in age, educational, functional background, gender, racial background and tenure. I classified studies into Harrison and Klein’s (2007) three types. The dependent variables included quantitative performance (financial performance measures like return on investment (ROI), return on equity (ROE), growth in market share, change in profitability), innovation (e.g., quality of ideas), and general performance (such as group effectiveness, team performance, and team project scores).

Meta-analysis procedure

The procedures used in this meta-analysis performed the techniques developed by Hunter and Schmidt (1990). For this study, meta-analysis software developed by Schmidt and Le was used. The required statistics were the individual correlations, the number of studies, and the reliabilities for the independent and dependent variables.

Results

Before examining hypotheses, I conducted meta-analyses on relationship between each separate diversity type and performance. The correlations where the diversity categories and the
outcome measures of quantity performance, innovation, and general performance are show in Table 1.

The first six columns of the table contain, respectively, the number of correlation coefficients, the total number of samples, the estimated true correlation ($\rho$), the estimated true residual standard deviation ($SD_\rho$), the upper and lower bound of the 80% credibility value for each distribution based on its true correlation, the upper and lower bound of the 95% confidence interval for each distribution, and percent variance in corrected correlation due to sampling error (% VE).

The credibility value indicates whether the validity can be generalized. When the value is large and contains zero, there is high chance of the existence of moderators. The confidence interval provides information about the accuracy of the effect size estimated from the meta-analysis, such that when the interval includes “0” we cannot conclude that the obtained correlation from the meta-analysis is significantly different from zero (Whitener, 1990).

As Table 1 shows, most of the results indicate that we cannot conclude that the obtained correlation from the meta-analysis is significantly different from zero. There is no relationship between demographic diversity in age, functional, racial background heterogeneity and performance (quantity, general performance, and innovation). As for educational, gender and tenure heterogeneity, they do show some relationships with innovation. In sum, the results show that the relationship between demographic diversity and performance is inconclusive as the diversity literature review had suggested. The possible remedy for this problem would be classifying diversity by the right typology of diversity and testing for moderating effects.
This study tested Harrison and Klein’s (2007) classification of diversity. The results are presented in Table 2. As Table 2 indicates, there is no relationship between separation type of diversity and quantity performance ($\rho = -.03$, 80% CV is -.26, .21, 95% CI is -.38, .32), innovation ($\rho = -.08$, 80% CV is -.36, .20, 95% CI is-.51, .35) and general performance ($\rho = .01$, 80% CV is -.18, .20, 95% CI is-.28, .30). The results did not support H1. Further, although the relationship between variety type of diversity and innovation ($\rho = .09$, 80% CV is -.10, .29, 95% CI is-.20, .38) and general performance ($\rho = .09$, 80% CV is -.09, .27, 95% CI is -.18, .36) is positive, there are no significant relationships because the confidence interval includes zero. The results also indicate no relationship between variety type of diversity and performance. Thus we failed to support H2.

| Table 2 Inserted about Here |

Finally, for the disparity type of diversity, there is a negative relationship between disparity diversity and innovation ($\rho = -.14$, 80% CV is -.22, -.05, 95% CI is -.23, -.003). While there are negative relationships between disparity type of diversity and quantity performance (and innovation), these confidence intervals include zero, ($\rho = -.03$, 80% CV is -.16, .09, 95% CI is -.23, .17; $\rho = -.15$, 80% CV is -.43, .14, 95% CI is -.60, .30). Thus, H3 is only supported with innovation.

It should be noted that less than 30% of the variance in the observed correlations across studies was explained by statistical artifacts (see Table 2). Pearlman, Schmidt, and Hunter (1980, cited in Weber and Donahue, 2001) have suggested that “if 75% or more of the variance in the observed correlations across studies is explained by artifacts (sampling error, measurement unreliability, and range restriction), then the presence of a moderated relationship
is unlikely”. The results show that there is likely to be the presence of moderators following the Hunter and Schmidt (1990) 75% rule.

**Discussion**

Recent meta-analyses reported with the same results as this study. Webber and Donnahue (2001) used two types of diversity attributes defined by Pelled (1996; Pelled et al., 1999) and did not find any relationship between diversity (highly job-related or less job-related diversity) and outcome variables such as cohesion and performance, as well as no moderation effects. Horwitz and Horwitz (2007) only found relationships between task-related diversity and team performance but no relationship between bio-demographic diversity and team performance or social integration. They also tested the moderating effects, and did not find any relationships.

Harrison and Klein (2007) proposed to remedy these inconsistent results or seemingly non-relationship results by differentiating three types of within-unit differences – separation, variety, and disparity. Although this study uses the classification of diversity they proposed, results were identical with previous meta-analyses studies. However, we need to be cautious interpreting this result. The present data show that moderation effects are likely to be present (%VE is less than 30). Some potential moderators could be task complexity (Bowers et al., 2000; Stewart & Barrick, 2000), team type (Cohen & Bailey, 1997), task interdependence (Burke et al., 2006; Duffy et al., 2000; Stewart & Barrick, 2000), team size (Gully et al., 1995; Magjuka & Baldwin, 1991) and methodological differences (Horwitz & Horwitz, 2007). Moderating variables may influence the magnitude and direction of these relationships. Further analyses to test the moderating effects are needed.
Another possible explanation is that the relationship between heterogeneity (diversity) and performance may be curvilinear (U-shaped) (Gibson & Vermeulen, 2003; Lau and Murnighan, 1998).

In conclusion, the results of this meta-analysis show that there is still an inconclusive relationship between diversity and performance. While this might suggest that such a relationship does not exist, it may also be that a more complex phenomenon is involved than has been expected. Future studies should continue to test other moderation effects that this study did not test and examine different outcome variables, such as cohesion or social integration.
Figure 1 Pictorial Representation of Types and Amounts of Three Meanings of Within-Unit Diversity

(Harrison, D. A. & Klein, K. J. (2007). What’s the difference? Diversity constructs as separation, variety, or disparity in organizations. *Academy of Management Review, 32*(4): pg1202)
### Table 1. Meta-Analytic Results for Relationships Between Diversity Types and Outcome Variables

<table>
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<th>80% C.V.</th>
<th>95% C.I.</th>
<th>% VE</th>
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*Note. K = number of correlations; N = total sample size; ρ = the estimated true correlation; SDρ = the estimated true residual standard deviation; 80% C.V. = the upper and lower bound of the 80% credibility value for each distribution based on its true correlation; 95% C.I.: the upper and lower bound of the 95% confidence interval for each distribution; %VE = percent variance in corrected correlation due to sampling error.*
Table 2. *Meta-Analytic Results for Relationships Between Harrison and Klein’s Diversity Types and Outcome variables*

<table>
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<tr>
<th>Outcomes Variables</th>
<th>K</th>
<th>N</th>
<th>$\rho$</th>
<th>$SD_\rho$</th>
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References marked with an asterisk indicate studies included in the meta-analyses.


18


Running head: DIVERSITY AND TEAM PERFORMANCE: A META-ANALYSIS


