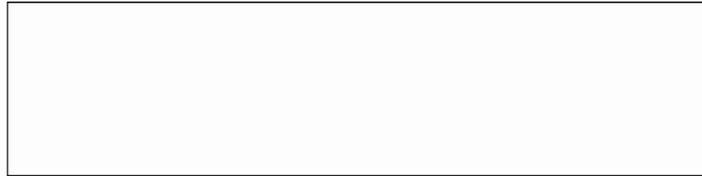




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Surface- and Deep-Level Dissimilarity Effects on Social Integration and Individual Effectiveness Related Outcomes in Work Groups: A Meta-Analytic Integration

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Keywords

work group diversity, surface-level dissimilarity, deep-level dissimilarity, individual effectiveness, meta-analysis, relational demography, social integration

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Abstract

Prior research linking demographic (e.g., age, ethnicity/race, gender and tenure) and underlying psychological (e.g., personality, attitudes, and values) dissimilarity variables to individual group member's work related outcomes produced mixed and contradictory results. To account for these findings this study develops a contingency framework and tests it using meta-analytic and structural equation modeling techniques. In line with this framework, results showed different effects of surface-level (i.e., demographic) dissimilarity and deep-level (i.e., underlying psychological) dissimilarity on social integration, and ultimately on individual effectiveness related outcomes (i.e., turnover, task and contextual performance). Specifically, surface-level dissimilarity had a negative effect on social integration under low but not under high team interdependence. In return, social integration fully mediated the negative relationship between surface-level dissimilarity and individual effectiveness related outcomes under low interdependence. In contrast, deep-level dissimilarity had a negative effect on social integration, which was stronger under high and weaker under low team interdependence. Contrary to our predictions, social integration did not mediate the negative relationship between deep-level dissimilarity and individual effectiveness related outcomes but suppressed positive direct effects of deep-level dissimilarity on individual effectiveness related outcomes. Possible explanations for these counterintuitive findings are discussed.

Surface- and Deep-Level Dissimilarity Effects on Social Integration and Individual Effectiveness
Related Outcomes in Work Groups: A Meta-Analytic Integration

For a variety of reasons – social, legal, competitive or strategic – organizations have and further will diversify their workforce (Ely & Thomas, 2001). While diversity can give an organization a competitive advantage, individuals have a tendency to prefer homogenous group settings (Pfeffer, 1983; Thomas, 1990). Accordingly, whether organizational diversification leads to negative, nil or even positive effects hinges crucially on understanding how one can overcome individuals' proclivities towards homogenous groups or organizations, and how diversity can be harnessed for organizational and work group effectiveness (Tsui, Egan, & O'Reilly, 1992). Two different research traditions have tried to meet this challenge.

The compositional approach refers to diversity as the distribution of differences among the members of a unit (e.g., work group or organization) with respect to common attributes, such as demographics, personality, attitudes, and many others (Harrison & Klein, 2007; Tsui & Gutek, 1999). The basic premise of the compositional approach rests on the idea that diversity affects all individuals of a unit in the same way. Hence, this approach takes a unit level perspective and suggests that diversity affects unit level processes (e.g., cohesiveness and conflict) and unit level outcomes (e.g., creativity and decision making). In other words this approach tries to answer the question: To what extent do compositional differences between units explain differences in unit level outcomes (e.g., are mixed gender work groups less cohesive and more creative than same gender work groups)?

In contrast, the relational approach focuses on the relationship between an individual's characteristics (e.g., in respect to a demographic or personality attribute) and the distribution of these characteristics in the individual's unit (Riordan, 2000; Tsui & Gutek, 1999). Accordingly,

diversity is described as dissimilarity or the extent to which an individual's demographic or idiosyncratic attributes are shared by others in the unit (e.g., in a work group of two males and four females, the two males are more dissimilar from the group than the four females). The basic premise of the relational approach rests on the idea that diversity is a function of an individual's degree of dissimilarity in a unit, and accordingly affects the more similar (e.g., the four males) and the more dissimilar (e.g., the two males) people in the same unit differently. Hence, this approach takes an individual-within-the-group perspective and suggests that diversity affects individual level processes (e.g., social integration) and individual level outcomes (e.g., turnover, contextual and task performance) as a function of people's relative level of dissimilarity in a unit. In other words, this approach tries to answer the question: How do within-group differences affect individual level outcomes (e.g., is a female/male in a mixed or same gender work group less socially integrated and less effective)?

While research in the tradition of the compositional approach has accumulated a bulk of empirical studies and qualitative reviews (for qualitative reviews see e.g., Jackson, Joshi, & Erhardt, 2003; Jackson, May, & Whitney, 1995; Mannix & Neale, 2005; Milliken & Martins, 1996; van Knippenberg & Schippers, 2007; Williams & O'Reilly, 1998), a couple of conceptual papers (e.g., Brickson, 2000; Harrison & Klein, 2007; Lau & Murnighan, 1998; Lawrence, 1997; van Knippenberg, De Dreu, & Homan, 2004), and various meta-analyses (e.g., Bell, 2007; Bowers, Pharmer, & Salas, 2000; Horwitz & Horwitz, 2007; Joshi & Roth, 2009; Webber & Donahue, 2001; Wood, 1987), the relational approach has received far less attention. As a case in point, only one qualitative review (Riordan, 2000) and one conceptual paper (Chattopadhyay, Tluchowska, & George, 2004) has been published so far focusing explicitly and exclusively on the relational approach; and no meta-analysis is available.

This is unfortunate, as it remains unclear, to what extent, when and how diversity at the relational level (i.e., dissimilarity) affects work related outcomes at the individual level (Riordan, 2000). Answers to these questions are important as they may complement our understanding on how to manage diverse work groups. In contrast to the compositional approach, the relational approach not only suggests that group member dissimilarity may vary substantially within a diverse work group, it also focuses on individual rather than group level outcomes, and it suggests that dissimilarity undermines rather than facilitates group member's work related outcomes (Riordan, 2000; Tsui & Gutek, 1999). Given these conceptual and theoretical differences, interventions (e.g., team interdependence) considered as an effective means to harness the positive effects of work group diversity (Brickson, 2000), may or may not help to overcome the proposed negative dissimilarity effects on individual members in diverse work groups.

In light of this, the present study examines to what extent, when and how different types of dissimilarity variables (i.e., diversity at the relational level) affect work related outcomes at the individual level. We extend existing research in the following ways. Firstly, on the basis of the social categorization perspective (Williams & O'Reilly, 1998) and the contact hypothesis (Allport, 1954; Pettigrew, 1998), we distinguish between surface-level (e.g., age, ethnicity/race, gender, tenure) and deep-level (e.g., personality, attitudes, beliefs, values) forms of dissimilarity, and develop a contingency framework that proposes different effects of surface-level and deep-level dissimilarity on individual effectiveness related outcomes (i.e., turnover, task and contextual performance). The framework explains these negative effects as a function of individual group member's social integration (i.e., attachment, satisfaction, and quality of social relations) and the extent to which the group context (i.e., team interdependence) facilitates

contact, communication and collaboration between group members. Secondly, by using meta-analytic techniques the study is the first of its kind to quantify average effect sizes of surface- and deep-level forms of dissimilarity on social integration and individual effectiveness related outcomes. Thirdly, the study brings a new meta-analysis to the literature that estimates the effects of social integration on individual effectiveness related outcomes. Finally, by using these meta-analytically derived correlations as inputs for structural equation modeling analyses, this study tests whether the proposed contingency framework helps to clarify when and how dissimilarity affects work related outcomes, and whether group level interventions (i.e., team interdependence) are a suitable means to overcome the proposed negative dissimilarity effects.

Key Concepts and Theoretical Background

In the tradition of the relational approach (Chattopadhyay, Tluchowska et al., 2004; Riordan, 2000; Tsui & Gutek, 1999) we define *dissimilarity* in work groups as the differences between a focal group member and his or her peers with respect to actual demographic (e.g., age, ethnicity/race, gender, and tenure) or idiosyncratic characteristics (e.g., personality, attitudes, values and beliefs). Dissimilarity is thereby conceptualized at the *individual-within-the-group* level (Riordan, 2000), where a person's relative standing within a group is of interest, and how this relative standing affects a person's work related outcomes at the individual level (e.g., attachment, satisfaction, quality of social relations, turnover, task and contextual performance). The term dissimilarity in work groups as we use it here is conceptually different from three other concepts often subsumed under the relational approach: dissimilarity in vertical, horizontal and provider-customer dyads (Tsui & Gutek, 1999). Vertical dissimilarity refers to differences between leader characteristics and follower characteristics, horizontal dissimilarity refers to differences between the characteristics of co-workers, and dissimilarity in customer-provider

dyads refer to differences between service provider and customer characteristics. The fundamental level of analysis of these three perspectives is the dyad and not the group. Due to these differences, and our interest in the effects of dissimilarity in work groups, the literature on dissimilarity in dyads has not been included.

A *work group* is defined as a set of three or more people that exists to perform organizationally relevant tasks, interacts socially, maintains and manages boundaries, and is embedded in a wider organizational context (Kozlowski & Bell, 2003). Work groups are often distinguished on the basis of their level of interdependence, which refers to the extent to which there are goal, reward, and task structures in place that promote a relationship between members of a unit in which each member is mutually responsible to and dependent on others (Wageman, 1995). Examples of work groups that are high on interdependence are *real groups* which are intact, bounded social systems, with interdependent members and differentiated member roles that pursue shared, measurable goals, draw on the same resources and receive some sort of collective reward for their efforts (Hackman, 1987). Examples of work groups that are low on interdependence are *pseudo work groups* which are a collection of individuals for whom there is no common work product or task that calls for collective skills and mutual accountability (Katzenbach & Smith, 1993). In the following study, work groups are meant to encompass both real and pseudo work groups.

In line with previous taxonomies used to classify diversity characteristics, we distinguish between actual *surface-* and *deep-level* forms of dissimilarity (see e.g., Harrison, Price, & Bell, 1998; Harrison, Price, Gavin, & Florey, 2002; Phillips & Lloyd, 2006; Riordan, 2000). According to these authors surface-level attributes are overt demographic characteristics. These attributes are almost immediately observable and measurable in simple and valid ways, and

social consensus can usually be assumed for each of these demographic attributes. Such attributes include for instance age, gender, race/ethnicity and tenure. In contrast, these authors refer to deep-level attributes as underlying psychological characteristics. Information about these factors is communicated through verbal and nonverbal behavior patterns and is only learnt through extended interaction and information gathering. These attributes are subject to construal and are more mutable than other aspects, including values, attitudes, and personality. We argue that combining the different types of surface-level and deep-level dissimilarity variables together helps increase the explanatory power of these dissimilarity variables as predictors of work related outcomes (Bacharach, 1989). By distinguishing between surface-level and deep-level dissimilarity we recognize each type of dissimilarity as a distinct theoretical construct based on the argument that they may lead to different predictions (Pelled, 1996). In doing so, we acknowledge the different dissimilarity variables' distinct and similar properties as predictors of work related outcomes (Zenger and Lawrence, 1989).

The concept of person-group fit is closely related to research on deep-level dissimilarity, which focuses on the interpersonal compatibility between individuals and their work groups (Kristof-Brown, Zimmerman, & Johnson, 2005). As such, the concept of person-group fit appears interchangeable with our definition of deep-level dissimilarity. Therefore, we included the literature on person-group fit providing the researcher conceptualized and operationalized differences between a focal individual and his or her peers at the individual-within-the-group level. Research on organization-fit, on the other hand, looks at the compatibility between individuals and an entire organization (Kristof-Brown et al., 2005). This line of research typically compares a focal individual to a whole organization rather than to other members of the

organization and is conceptually different to our definition of deep-level dissimilarity. Literature on person-organization fit has therefore been omitted.

Theoretical Model and Hypotheses

Our theoretical model is displayed in Figure 1.

Surface- versus Deep-Level Dissimilarity Effects on Social Integration

The most commonly studied work related outcome at the individual level in diversity research is social integration (Tsui & Gutek, 1999). *Social integration* refers to “the degree to which an individual is psychologically linked to others in a group” (Hambrick, 1994: 189). In line with previous research we conceptualize social integration as a function of attachment with a given group, satisfaction with peers and job, and the quality of social relations (e.g., Harrison et al., 1998; Harrison et al., 2002; O'Reilly, Caldwell, & Barnett, 1989). *Attachment* refers to the overlap of an individual's self image with his or her image of the social unit (Riketta, 2005), which comprises the two closely related constructs of commitment and identification (Riketta, 2005; Riketta & Van Dick, 2005). *Satisfaction* refers to a cognitive and/or affective evaluation of one's work as more or less positive or negative (Brief & Weiss, 2002). *Quality of social relations* refers to an individual's perceptions of the status of his or her social relations with other group members (Asendorpf & Wilpers, 1998). The construct thereby subsumes an individual's perceptions of relationship conflict experienced when interacting with other group members, the amount of social support received from these peers, and the extent to which individuals perceive themselves included in a work group.

On the basis of the social identity approach, which encompasses self-categorization theory (SCT, Turner, 1982) and social identity theory (SIT, Tajfel, 1978; Tajfel & Turner, 1979), relational demographers posit an inverse relationship between surface-level dissimilarity and

social integration (cf. Riordan, 2000; Tsui & Gutek, 1999). According to SCT (Turner, 1982), people define and differentiate themselves from others on the basis of observable differences, such as demographic characteristics or work group membership, and place themselves and similar others into in-groups and dissimilar others into out-groups. Empirical evidence and theorizing put forward by the distinctiveness principle (McGuire & McGuire, 1981) and relational demographers (Chatman, Polzer, Barsade, & Neale, 1998) further suggests that people who belong, in terms of their demographic group membership to the numerical minority in a work group (e.g., the two males in a group composed of four other females), are more likely to become aware of their demographic group membership. Therefore, they are more likely to define and differentiate themselves from others on the basis of their demographic group membership than in terms of their work group membership. In a similar vein, research in the tradition of the gestalt figure-ground principle documents that people who belong, in terms of their demographic group membership, to the numerical minority in a work group, are more likely to become visible and capture a disproportionate amount of attention from their peers (Fiske & Taylor, 1991). Therefore, peers are more likely to perceptually segregate them from the work group on the basis of their different demographic group membership (Mullen, 1987).

According to SIT (Tajfel, 1978; Tajfel & Turner, 1979) placing themselves and demographically similar others into in-groups and demographically dissimilar others into out-groups helps people to enhance and maintain a positive social identity by comparing their own in-group favorably relative to the out-group. In line with these arguments, research shows that people perceive out-group members as less trustworthy, honest and cooperative than are members of their in-group (Turner, 1982). It then follows that people who are more dissimilar in terms of surface-level characteristics will perceive their colleagues more negatively, and will be

perceived by their peers more negatively. Accordingly, they should also feel less attached to their work group, be less satisfied with their work and peers, and find cooperating and interacting with their peers more difficult.

Hypothesis 1a: Surface-level dissimilarity is negatively related to social integration.

Even though the similarity-attraction paradigm (Byrne, 1971) and the attraction-selection-attrition (ASA) model (Schneider, 1987) have also been used to explain these surface-level dissimilarity effects, dissimilarity researchers (e.g., Chatman & Spataro, 2005; Harrison et al., 2002; Riordan, 2000) contend that the two similarity-attraction frameworks more adequately explain deep-level dissimilarity effects. The similarity-attraction paradigm and the ASA model maintain that people feel more attracted to others who have similar psychological characteristics, because similarity in personality, attitudes and values eases interpersonal interactions, facilitates communication and friendship, and leads to the verification and reinforcement of people's own attitudes, beliefs and personality. Accordingly, dissimilar group members may feel less attached to their work group, be less satisfied with work and their peers, find it more difficult to interact and communicate with their peers, and are more likely to be excluded from social interactions. Conceptualizing social integration as a function of attachment with work group, satisfaction with work and peers, and quality of social relations it then follows that deep-level dissimilarity should undermine social integration.

Hypothesis 1b: Deep-level dissimilarity is negatively related to social integration.

The Moderating Effect of Team Interdependence

Our argument so far suggests that surface- and deep-level dissimilarity engender the same negative effects on social integration. However, prior studies produced mixed results (Riordan, 2000). To explain these mixed results we draw on the contact hypothesis (Allport, 1954; Amir,

1969) and derive differential predictions for surface- and deep-level dissimilarity effects on social integration (cf. Harrison et al., 1998; Harrison et al., 2002; Phillips & Lloyd, 2006; Riordan, 2000). Specifically, the contact hypothesis suggests that once people interact, they get to know each other, and replace their initial depersonalized perceptions of dissimilar others with more idiosyncratic knowledge of others (for overviews see Pettigrew, 1998; Pettigrew & Tropp, 2006). Accordingly, we suggest that individuals are likely to base their initial categorization of others on surface-level attributes. These attributes are visible and easily accessible from the immediate moment a social unit begins to exist. In contrast, as information and knowledge about deep-level characteristics are only obtained after frequent interactions, it will take time for these deep-level differences to be uncovered. Thus, the extent to which the context facilitates or limits contact between individuals in a social unit will determine whether surface- or deep-level characteristics become salient.

Team interdependence has been identified as one of the key interventions by which organizations can facilitate contact among employees in diverse organizations (Brickson, 2000; van Knippenberg & Schippers, 2007). *Team interdependence* has been defined as the extent to which an organization's formal contextual features, such as its goal, reward, and task structures, promote a relationship between members of a unit in which each member is mutually responsible to and dependent on others (Wageman, 1995). It has been documented that higher team interdependence, such as for instance in real groups, leads group members to spend more time together and increases their motivation to collaborate with each other (for meta-analytic evidence see Johnson, Maruyama, Johnson, Nelson, & Skon, 1981). It follows that high team interdependence may increase opportunities for employees to interact with each other, whilst low team interdependence, such as for instance in pseudo groups, may limit such opportunities.

Accordingly, surface-level dissimilarity may weaken when people have frequent opportunities to interact with each other, or strengthen negative effects when people have few opportunities to interact with each other. In contrast, the negative effects of deep-level dissimilarity may strengthen when people have frequent opportunities to interact with each other, yet weaken these effects when people have less frequent opportunities to interact with each other. Thus:

Hypothesis 2a: The negative relationship between surface-level dissimilarity and social integration is weaker under high team interdependence than under low team interdependence.

Hypothesis 2b: The negative relationship between deep-level dissimilarity and social integration is stronger under high team interdependence than under low team interdependence.

Social Integration as a Mediator of the Relationship between Surface- and Deep-Level Dissimilarity with Individual Effectiveness Related Outcomes

While social integration is the most commonly studied outcome in diversity research (Harrison et al., 2002; Tsui & Gutek, 1999), individual effectiveness related outcomes are the most frequently investigated constructs within individual level organizational research (Harrison, Newman, & Roth, 2006). *Individual effectiveness* related outcomes refer to desirable inputs related to one's work role (Harrison et al., 2006) and encompass employee's permanent withdrawal from work (i.e., *turnover*), as well as the individual's task and contextual performance. *Task performance* refers to an individual's proficiency with which he or she performs activities that contribute to a work group's *technical core* either indirectly, by providing needed materials or services, or directly, by implementing part of its technological process (Borman & Motowildo, 1993). *Contextual performance* refers to discretionary behavior

that is not part of an employee's formal job requirements, not enforceable by supervisors, and may not be recognized by formal reward systems (Borman & Motowildo, 1993; Organ, 1988).

Relational demographers (e.g., O'Reilly et al., 1989; see also Riordan, 2000; Tsui & Gutek, 1999) and dissimilarity researchers (e.g., Schaubroeck & Lam, 2002) suggest that the negative effects of surface-level and deep-level dissimilarity on individual effectiveness related outcomes are indirect and transmitted via lower levels of social integration. Meta-analytic evidence supports these claims and suggests that people who are less attached to and satisfied with their work group are less likely to engage and offer input into their work, and may progressively withdraw from their work (Harrison et al., 2006; Judge, Thoresen, Bono, & Patton, 2001; J. P. Meyer, Stanley, Herscovitch, & Topolnytsky, 2002; Riketta, 2005). Furthermore, because people with unfavorable social relations may have fewer opportunities to meet the performance expectations of their peers and have less access to resources and information (Seers, 1989), it may be more difficult for them to engage at work, and make it more likely for them to withdraw. Thus, lower social integration should undermine employee's effectiveness related outcomes, and lead to higher turnover and lower task and lower contextual performance.

Hypothesis 3: There is a positive relationship between social integration and task performance.

Hypothesis 4: There is a positive relationship between social integration and contextual performance.

Hypothesis 5: There is a negative relationship between social integration and turnover.

Despite these arguments, it remains unclear as to whether surface- and deep-level dissimilarity undermines individual effectiveness related outcome variables via lower levels of social integration at the individual level (Riordan, 2000; Tsui & Gutek, 1999). For instance,

O'Reilly and colleagues (1989; see also Harrison et al., 1998; Harrison et al., 2002) found evidence of social integration mediating the relationship between diversity (in terms of tenure and age) and turnover at the group level, but no evidence of social integration mediating the relationship between surface-level dissimilarity (in terms of age and tenure) and turnover at the individual level. On the other hand, Schaubroek and Lam (2002) showed that social integration did mediate the relationship between deep-level dissimilarity (in terms of personality) and task performance. In line with our earlier hypotheses (i.e., 1a/b, 2a/b and 3, 4, 5) we suggest that one of the reasons for these mixed findings could be because the relationships of surface- and deep-level dissimilarity with social integration are contingent on team interdependence. Thus, only if there is a negative relationship between dissimilarity and social integration will these effects materialize in lower effectiveness. Accordingly, we propose mediated moderation effects whereby surface-level dissimilarity undermines individual effectiveness related outcomes via lower levels of social integration, in particular, under low team interdependence. Deep-level dissimilarity, however, undermines individual effectiveness related outcomes via lower levels of social integration, in particular, under high team interdependence. Therefore:

Hypothesis 6a: Under low team interdependence, social integration mediates the negative relationship between surface-level dissimilarity and task performance.

Hypothesis 6b: Under high team interdependence, social integration mediates the negative relationship between deep-level dissimilarity and task performance.

Hypothesis 7a: Under low team interdependence, social integration mediates the negative relationship between surface-level dissimilarity and contextual performance.

Hypothesis 7b: Under high team interdependence, social integration mediates the negative relationship between deep-level dissimilarity and contextual performance.

Hypothesis 8a: Under low team interdependence, social integration mediates the positive relationship between surface-level dissimilarity and turnover.

Hypothesis 8b: Under high team interdependence, social integration mediates the positive relationship between deep-level dissimilarity and turnover.

Method

We tested our hypotheses by applying structural equation modeling techniques to meta-analytically derived correlation matrices of relationships among surface-level (i.e., age, gender, race/ethnicity and tenure) and deep-level (i.e., values, attitudes, and personality) dissimilarity with indicators of social integration (i.e., attachment, satisfaction, quality of social relations) and individual effectiveness related outcomes (i.e., contextual and task performance, and turnover).

Development of the Meta-Analytic Correlation Matrices

The correlation matrices were derived by standard meta-analytic methods that aggregate correlations across previous studies (Hunter & Schmidt, 2004).

Literature search. To locate suitable studies, we searched for published and unpublished research investigating the relationship of surface- and/or deep-level dissimilarity with indicators of social integration (i.e., attachment, satisfaction and quality of social relations) and individual effectiveness (i.e., contextual and task performance, and turnover). In particular, we used search engines (e.g., Proquest, PsychInfo, and ISI Web of Science), sent requests for relevant data to listservers (e.g., those offered by the OB [Organizational Behavior] and GDO [Gender and Diversity in Organizations] divisions of the Academy of Management), and checked the reference lists of published qualitative reviews (e.g., Dionne, Randel, Jaussi, & Chun, 2004; Milliken & Martins, 1996; Riordan, 2000; Tsui & Gutek, 1999; Williams & O'Reilly, 1998), meta-analyses (e.g., Kristof-Brown et al., 2005), as well as all relevant studies we retrieved.

Because too few of the above mentioned studies presented correlations for the relationship of quality of social relations with attachment, satisfaction and indicators of individual effectiveness and no meta-analytic estimates are available yet, we separately searched for such studies using search engines (e.g., Proquest, PsychInfo, and ISI Web of Science) and checking the references lists of all relevant studies we retrieved.

Study inclusion. Studies had to meet a number of criteria to be included. First, dissimilarity had to be conceptualized at the individual-within-the-group level and operationalized at the individual level in terms of the difference score approach using either the Euclidean Distance formula (e.g., Tsui et al., 1992) or the proportional in-group size formula (e.g., Elvira & Cohen, 2001). Studies operationalizing dissimilarity as an interaction between the distribution of the dissimilarity attribute in the work group and the focal individual's characteristic on this attribute (e.g., Chattopadhyay, George, & Lawrence, 2004; Riordan & Shore, 1997) were not included as these studies report only higher order correlations, making them difficult to interpret and biasing meta-analytic correlation estimates (Hunter & Schmidt, 2004; Kristof-Brown et al., 2005). We also didn't include dissimilarity variables that were operationalized in terms of the perceptual approach (e.g., Graves & Elsass, 2005; Kirchmeyer, 1995), because not enough studies were available to be included in our analysis (number of correlations [k] was fewer than three prior to moderator analysis). Secondly, studies had to investigate either a relationship at the individual level between actual surface-level (i.e., age, race/ethnicity, gender, tenure) or between actual deep-level dissimilarity (i.e., personality, attitudes, and values) with indicators of social integration (i.e., attachment, satisfaction and quality of social relations) and effectiveness related outcomes (i.e., task and contextual performance, and turnover). Thirdly, the focus of the study had to be on dissimilarity in work

groups. As discussed earlier, research on dissimilarity in dyads is conceptually different and looks at different outcomes than research on dissimilarity in work groups (Tsui & Gutek, 1999). Studies looking at dyadic dissimilarity have therefore not been included (e.g., Tsui, Porter & Egan, 2002). Fourth, the social unit under investigation had to be a work group or work unit in a naturalistic setting in which social interaction between members was potentially possible, and tasks accomplished in these units had to be relevant for business-related organizational settings. Therefore some studies reported in the social psychology literature in which subjects work on tasks irrelevant for business-related organizational settings and in which no social interaction between group members takes place have not been included (e.g., Lord & Saenz, 1985; Vohs, Baumeister, & Ciarocco, 2005).

From studies investigating the relationship between quality of social relations and attachment, satisfaction, turnover, task performance or contextual performance, only those including bivariate correlations obtained using a different data source (e.g., self-reports and supervisor ratings) or at different measurement points were included in order to avoid correlation inflation caused by common method variance. In the case of longitudinal studies, we included only the correlations in which quality of social relations was measured first.

Data Set. Applying the specified inclusion criteria resulted in an initial set of 129 independent correlations (from 61 articles and 67 studies) for the relationship between the dissimilarity variables and the indicators of social integration and effectiveness, and 51 correlations (from 38 articles and studies) for the relationship of quality of social relations with attachment, satisfaction, turnover, contextual and task performance. Independent data sets were constructed for each of the specific moderator analyses. Dependent correlations in the data set

were represented by unit-weighted composite correlations. We didn't encounter any redundancies of data (i.e., where the same data set has been published more than once).

Features of the Samples Included in the Meta-analysis

69.84 per cent of the samples analyzed herein were published in the years 2000-2009. 20.64 per cent were published in the years 1990-1999, and 9.52 per cent were published in the years 1980-1989. The average sample consisted of 44.65 per cent females and 55.35 per cent males (gender proportions were reported for 92.75 per cent of the samples), and 63.23% Whites (which was always reported). Mean age and tenure across samples were 35.95 and 8.81 years, respectively (age and tenure information was available for 88.8 per cent and 49.2 per cent of the samples, respectively). 57.14 per cent of the samples were drawn from the USA, 7.94 per cent from the Netherlands, 6.34 per cent from the UK, and 3.17 per cent from Taiwan. The remaining samples were from Australia, Canada, Hong Kong, Japan, Korea, and Mexico, and each accounted for 1.58 per cent. The country of origin of the other samples was mixed or not evident from the respective studies (15.93 per cent). Most samples were drawn from unspecified or diverse industries (31.75 per cent), 7.94 per cent were drawn from financial service organizations (banks, insurances, and accounting firms), 12.72 per cent were from health or social service organizations (above all, hospitals), 11.11 per cent from other non-public services (e.g., food, retailing, and telecommunication), 11.11 per cent of the samples were from the public sector, except health and social services (e.g., education, police, and armed forces), 6.35 per cent from manufacturing firms, and 19.02 per cent were drawn from settings in Higher Education (such as members of student learning projects or business game simulations). The most prominent occupational groups among the analyzed samples were white color workers and managers (33.33 per cent of the samples), pink color workers (7.94 per cent), and blue color workers (4.75 per

cent); the remainder of the samples (34.96 per cent) comprised other, unspecified or diverse occupational groups or were students (19.02 per cent). The median work group size was 6.68 (with an average group size of 89).

Coding. The authors and a doctoral researcher served as the main coders for the meta-analysis. The first author trained the doctoral researcher on the coding scheme. First, the doctoral researcher was given a coding sheet along with a sheet that outlined additional information, regarding the different variable categorizations. Each coder and the second and third author then independently coded five articles. Next, all coders met for a follow up session to discuss problems encountered using the coding and information sheets and to make changes to either sheet as deemed necessary. The first author and doctoral researcher then coded all the remaining articles. Inter-rater agreement was high, with a mean agreement of .91 (Cohen's Kappa). All remaining disagreements were discussed between the two coders until consensus was reached.

The type of dissimilarity variable (surface- versus deep-level) was coded along with the specified outcomes (attachment, quality of social relations, satisfaction, contextual and task performance, and turnover) using the respective definitions presented earlier. This coding was based on information retrieved from the measurement descriptions in the primary studies. Very few studies measured the moderator variable team interdependence (e.g., Chattopadhyay, George & Shulman, 2008). Therefore we inferred the level of interdependence from the descriptions of group characteristics provided in the primary studies. Two categories, high and low team interdependence were used. Following Wageman's (1995) conceptualization of team interdependence, high team interdependence was inferred when group members pursued shared goals, worked most of their time on the same task, and received some sort of collective reward for their efforts, as for instance in the real groups reported by Chattopadhyay (1999) and by Liao,

Joshi and Chuang (2004). Low team interdependence was inferred when group members didn't pursue shared goals, when there wasn't a common work product, and when group members were rewarded on the basis of their individual performance, as for example in the pseudo groups reported by Tsui et al. (1992) and Zatzick, Elvira and Cohen (2003). When team interdependence scores were reported they corroborated the validity of our team interdependence coding: for instance we coded the groups in the Chattopadhyay et al. (2008) study as highly interdependent, which is in line with the reported team interdependence score of 5.12 (measured on a 7-point scale with higher scores indicating higher interdependence).

Meta-analytic correlation matrices. The meta-analysis relied on the widely used Hunter and Schmidt (2004) approach. First, the correlations were corrected for unreliability using artifact distributions for the specified criterion (i.e., for the indicators of social integration and individual effectiveness related outcomes). Correlations were not corrected for unreliability of the surface- and deep-level dissimilarity measures, because researchers frequently argue that measures based on hard data are unbiased (Riketta, 2005). In the second step, weighted averages of the corrected correlations across studies were computed using sample size and the disattenuation factor as weights. This was done for the relationships of surface-level (see Table A1 in the Appendix) and deep-level dissimilarity (see Table A2 in the Appendix) with indicators of social integration (i.e., attachment, satisfaction and quality of social relations) and individual effectiveness (i.e., task and contextual performance, and turnover), as well as for the relationship of quality of social relations with satisfaction, attachment, and the individual effectiveness related outcomes (see Table A3 in the Appendix). We separately meta-analyzed quality of social relations effects because too few of the studies looking at surface- and deep-level dissimilarity reported such effects and no meta-analytic estimates are available yet. In the third step, the

weighted averages corrected correlations of surface- and deep-level dissimilarity with indicators of social integration (i.e., attachment, satisfaction and quality of social relations) at high and low levels of the moderator variable team interdependence were computed using subgroup analyses techniques as suggested by Hunter and Schmidt (2004). Accordingly separate meta-analyses were conducted (see Table A1 and A2 in the Appendix) at each of the specified moderator levels (i.e., at high and low levels of team interdependence). In a final step, we combined our 29 newly derived meta-analytic correlation estimates with 10 existing meta-analytically derived bivariate correlations for the relationships between satisfaction, attachment, turnover, contextual performance, and task performance (as reported in Table 2, page 314 in Harrison et al., 2006 who review and meta-analyze this literature) in order to create the correlation matrices presented in Table 1 and Table 2. We did this because none of the primary studies included in our meta-analyses reported correlations between these variables.

Analytic Framework for Hypothesis Testing

To test our hypotheses, we estimated two sets of multiple-sample structural equation models (Kline, 2005; cf. Viswesvaran & Ones, 1995): one set to estimate the models for surface-level dissimilarity; the other set to estimate the models for deep-level dissimilarity. Every model in each set was simultaneously fit to two meta-analytic correlation matrices assembled from the correlations of surface-level (or deep-level) dissimilarity with work related outcomes under high team interdependence, and from the correlations of surface-level (or deep-level) dissimilarity with work related outcomes under low interdependence. Within each set four models were evaluated: To test whether team interdependence moderated the relationship between dissimilarity (i.e., surface- or deep-level) and social integration, *Model 1a* and *2a* allowed the correlations of dissimilarity (i.e., surface- or deep-level) with social integration to vary between

the two subgroups (i.e., high versus low team interdependence), while *Model 1b* and *2b* constrained the correlation of dissimilarity (i.e., surface- or deep-level) with social integration to be the same. Moderation can be inferred in case *Model 1a* or *2a* fit the data better than *Model 1b* or *2b*. To test whether social integration fully mediated the relationship between dissimilarity and individual effectiveness related outcomes, *Model 2a* and *2b* included direct paths between dissimilarity (i.e., surface-level or deep-level) and individual effectiveness related outcomes, while *Model 1a* and *1b* didn't include direct paths. Full mediation can be inferred in case *Model 1a* or *1b* fit the data better than *Model 2a* or *2b*. In line with prior empirical evidence (Tsui et al., 1992; Tsui & Gutek, 2000), we specified social integration in all models as a first order latent variable reflected by group members' quality of social relations, attachment and satisfaction.¹

Following recommendations by Hom, Caranikas-Walker, Prussia and Griffeth (1992; cf. Viswesvaran & Ones, 1995) we estimated the multiple-sample structural equation models using the maximum likelihood estimate method in AMOS 16.0.1 (Arbuckle, 2007). Given that sample sizes varied across the various cells of the inputted correlation matrices, we used the harmonic mean of each subsample to calculate model estimates, standard errors and fit indices (Viswesvaran & Ones, 1995). To assess overall model fit and to compare between model fit we followed recommendations by Kline (2005). Accordingly we inferred acceptable overall model fit when CFI values were larger than .9 and RMSEA and SRMR values fall below .1. To test the difference in fit between models, we calculated the difference in model chi-square and degrees of freedom, and compared the values with the χ^2 -distribution.

Results

The meta-analytic correlation matrices on which the analyses were conducted are displayed in Table 1 and Table 2. Results for the respective meta-analyses of the surface-level

dissimilarity effects, deep-level dissimilarity effects, and the quality of social relations effects can be found in the Appendix (see Tables A1, A2 and A3).

Model Comparisons. Model fit indices and comparisons for the models of the relationships between surface-level and deep-level dissimilarity with social integration and effectiveness related outcomes (i.e., task and contextual performance, and turnover) are displayed in Table 3.

For surface-level dissimilarity (see Table 3), Model 1a, which suggested that team interdependence moderates the relationship between dissimilarity and social integration, and in which social integration fully mediates the relationship between surface-level dissimilarity and individual effectiveness related outcomes, fit the data best. Specifically, Model 1a had favorable fit indices; and when compared to Model 1b had a better overall fit ($\Delta\chi^2 = 10.41$, $df = 1$, $p < .01$); while the more complex Models 2a and 2b when compared with Model 1a did not improve overall model fit ($\Delta\chi^2 = 5.49$, $df = 3$, $p > .1$; $\Delta\chi^2 = -4.91$). For deep-level dissimilarity (see Table 3), Model 2a, which proposed that team interdependence moderates the relationship between dissimilarity and social integration, and in which social integration partially mediates the relationship between deep-level dissimilarity and individual effectiveness related outcomes, fit the data best. This is corroborated by the findings that Model 2a had the most favorable fit indices; and had a better overall fit than Model 1a ($\Delta\chi^2 = 80.51$, $df = 3$, $p < .01$), Model 1b ($\Delta\chi^2 = 99.36$, $df = 4$, $p < .01$), and Model 2b ($\Delta\chi^2 = 18.18$, $df = 1$, $p < .01$). Accordingly, we used Model 1a to test our hypotheses for surface-level dissimilarity, and Model 2a to test our hypotheses for deep-level dissimilarity. The standardized path estimates for the surface-level and the deep-level dissimilarity model are displayed in Figures 2 and 3 respectively.

Hypotheses 1a and 1b. Hypothesis 1a suggested a negative relationship between surface-level dissimilarity and social integration, and Hypothesis 1b suggested a negative relationship between deep-level dissimilarity and social integration. As can be seen in Figure 2 and 3, surface-level dissimilarity had a negative effect on social integration ($\gamma = -.06, p < .01$), and so had deep-level dissimilarity on social integration ($\gamma = -.21, p < .05$). Thus, hypotheses 1a and 1b were fully supported.

Hypotheses 2a and 2b. Hypothesis 2a suggested that the negative relationship between surface-level dissimilarity and social integration becomes weaker under high versus low team interdependence, while Hypothesis 2b suggested that the negative relationship between deep-level dissimilarity and social integration becomes stronger under high versus low team interdependence. In line with Hypotheses 2a and 2b, model comparisons presented in the previous section suggest that team interdependence moderated the negative relationship of surface- and deep-level dissimilarity with social integration. As can be seen in Figure 2, surface-level dissimilarity had no effect on social integration under high team interdependence ($\gamma = -.02, p > .20$), but affected it negatively under low team interdependence ($\gamma = -.10, p < .01$). This fully supports hypothesis 2a. In contrast (see Figure 3), deep-level dissimilarity had a stronger negative effect on social integration under high ($\gamma = -.28, p < .01$), and a weaker negative effect under low team interdependence ($\gamma = -.13, p < .01$). Thus, hypothesis 2b was fully supported.

Hypotheses 3-5. Hypotheses 3-5 suggested a positive effect of social integration on individual effectiveness related outcomes. Findings for the surface-level (see Figure 2) and the deep-level (see Figure 3) model revealed a positive effect of social integration on task performance ($\gamma = .36, p < .01$ and $\gamma = .37, p < .05$) and contextual performance ($\gamma = .40, p < .01$

and $\gamma = .42, p < .01$), and a negative effect of social integration on turnover ($\gamma = -.30, p < .01$ and $\gamma = -.30, p < .05$). This fully supports Hypotheses 3-5.

Hypotheses 6a/b, 7a/b, 8a/b. Hypotheses 6a, 7a and 8a suggested that social integration fully mediates the relationship between surface-level dissimilarity with individual effectiveness related outcomes under low but not under high team interdependence. Model comparisons presented in the previous section supported a fully mediated moderation model. Moreover, the indirect effects of surface-level dissimilarity on individual effectiveness related outcomes via social integration were negative under low team interdependence (task performance: $\gamma = -.04, p < .01$; contextual performance: $\gamma = -.04, p < .01$; and turnover: $\gamma = .03, p < .01$), but not significant under high team interdependence (task performance: $\gamma = -.01, p > .20$; contextual performance: $\gamma = -.01, p > .20$; and turnover: $\gamma = .01, p > .20$). This fully supports Hypotheses 6a, 7a, and 8a.

Hypotheses 6b, 7b and 8b suggested that social integration mediates the relationship between deep-level dissimilarity with individual effectiveness related outcomes, whereby the effects should be stronger under high and weaker under low team interdependence. As predicted, the indirect effects for deep-level dissimilarity on individual effectiveness related outcomes via social integration were weaker under low team interdependence (task performance: $\gamma = -.05, p < .05$; contextual performance: $\gamma = -.06, p < .05$; turnover: $\gamma = .04, p < .05$) and stronger under high team interdependence (task performance: $\gamma = -.11, p < .05$; contextual performance: $\gamma = -.12, p < .05$; turnover: $\gamma = .09, p < .01$). This supports Hypotheses 6b, 7b, and 8b. At the same time, however, positive direct effects of deep-level dissimilarity on individual effectiveness related outcome variables were found (task performance: $\gamma = .07, p < .05$; contextual performance: $\gamma = .12, p < .01$; turnover $\gamma = -.05, p < .05$). This qualifies social integration as a suppressor variable (MacKinnon, Krull, & Lockwood, 2000), which does not only account for the negative effects of

deep-level dissimilarity on individual effectiveness related outcomes, but also engenders, when controlling for it, deep-level dissimilarity to have a positive effect on individual effectiveness related outcomes.

Discussion

Using both meta-analytic and structural equation modeling techniques, this study provides answers to the questions when, how, and to what extent surface-level and deep-level dissimilarity (conceptualized as an individual-within-the-group level construct) affects group members' social integration and effectiveness related outcomes (i.e., task and contextual performance, and turnover) at the individual level. In line with conclusions drawn in previous qualitative reviews (Riordan, 2000), the negative effect of surface-level dissimilarity on social integration ($\gamma = -.06$) and the negative indirect effects via social integration on individual effectiveness related outcomes appear rather small (average: $\gamma = -.02$). However, these negative effects nearly doubled in size under low team interdependence (direct: $\gamma = -.10$; average indirect: $\gamma = -.04$), and disappeared under high team interdependence (direct: $\gamma = -.02$; average indirect: $\gamma = -.01$). In a similar vein, the negative effect of deep-level dissimilarity on social integration ($\gamma = -.21$) and the negative indirect effects via social integration on individual effectiveness related outcomes ($\gamma = -.07$) increased by nearly 50% under high team interdependence (direct: $\gamma = -.28$; average indirect: $\gamma = -.10$), and decreased by nearly 50% under low team interdependence (direct: $\gamma = -.13$; average indirect: $\gamma = -.05$). Thus, differentiating between surface-level and deep-level forms of dissimilarity and accounting for the moderating effects of team interdependence helped to increase the predictive validity of dissimilarity effects on social integration and individual effectiveness related outcomes substantially.

These contingencies, in combination with the small effect sizes, may help to explain why prior research often failed to detect mediating mechanisms explaining the effects of surface-level and deep-level dissimilarity on individual effectiveness related outcomes (cf. Riordan, 2000). Even if we assume a large effect between the mediator and the outcome variable (such as in this study found between social integration and individual effectiveness related outcomes), the small effects of surface- and deep level dissimilarity on social integration will require at least a sample size of 385 individuals when bias corrected bootstrap methods are used or 414 individuals when Baron and Kenny's classical approach to test for mediation is used (Fritz & MacKinnon, 2007). Future research should therefore pay increased attention to these contingencies and sample size issues when testing for the underlying mechanisms explaining such surface- and deep-level dissimilarity effects.

The effect sizes between surface-level and deep-level dissimilarity with social integration and individual effectiveness related outcomes also compare favorably with those found for work group diversity. For instance, Horwitz and Horwitz (2007) found no effects for surface-level work group diversity (which they referred to as bio-diversity) on social integration and team performance. In a similar vein, Bell (2007) reports that, except for heterogeneity in openness to experience, other deep-level facets of work group diversity did not affect team performance. Furthermore, team interdependence was not found to moderate the effects of surface-level diversity on social integration and team performance in the Horwitz and Horwitz meta-analysis, or the effects of deep-level work group diversity on team performance in the Bell meta-analysis. Finally, the meta-analysis by Joshi and Roh (2009) suggests that under high levels of team interdependence, surface-level diversity elicits positive effects, whilst moderate and low levels of team interdependence lead to negative or nil effects on team performance. Taken together, this

shows that looking at dissimilarity related effects is as important as looking at diversity related effects. It also highlights that there are likely to be conceptual differences underlying the empirical differences between individual-level dissimilarity and group-level diversity effects. Hence, a fruitful way for future research might be to look at these individual-level dissimilarity and group-level diversity effects simultaneously (e.g., Choi, 2007), and how they interact with each other and their respective underlying diversity dimension (e.g., Brodbeck et al., in press).

Theoretical Implications

The finding that team interdependence buffered the negative effects of surface-level dissimilarity on social integration but accentuated the negative effects of deep-level dissimilarity supports the idea that the underlying processes are qualitatively different. For surface-level dissimilarity, the results are in line with the social identity approach (Tajfel, 1978; Tajfel & Turner, 1979; Turner, 1982). The negative relationship between surface-level dissimilarity and social integration under low team interdependence suggests that dissimilar group members identified less with their work group and experienced poorer relationships with their peers. In other words, dissimilar group members may have categorized self rather in terms of their demographic group membership than in terms of their work group membership; and their peers may have perceived them as out-group rather than as in-group members. In contrast, high team interdependence may have rendered work group membership more salient, accordingly dissimilar group members were more likely to categorize themselves in terms of their work group membership; and their peers were more likely to perceive them as in-group members. The finding that social integration translated into lower effectiveness (i.e. higher turnover, lower task and lower contextual performance) under low but not under high team interdependence is also well in line with the social identity approach, which suggests that salient work group

membership and perceptions of collective goals and interests increases the motivation to exert effort on behalf of the collective (van Knippenberg, 2000).

The results illustrating the accentuation of deep-level dissimilarity under high levels of team interdependence could be explained through the contact hypothesis (Allport, 1954; Pettigrew, 1998) and the similarity attraction paradigm (Byrne, 1971). These theories would suggest that high levels of team interdependence facilitated personalization of group members, rendering the underlying deep-level dissimilarity attributes more salient. As individuals prefer similar others, they find interactions with dissimilar others more difficult and less reinforcing, which in return lead to lower levels of social integration and undermining dissimilar group members' effectiveness related outcomes. However, the similarity-attraction paradigm cannot account for the direct positive effects of deep-level dissimilarity on individual effectiveness related outcomes and, consequently, for the suppressing effects of social integration.

It seems also unlikely that information/decision making processes, as discussed in the work group diversity literature (cf. van Knippenberg & Schippers, 2007), account for these findings, as deep-level dissimilarity engendered not only a positive effect on task performance, but also on contextual performance, and it was negatively related to turnover. A motivational account, such as put forward by theorizing on social self-regulation (Abrams, 1994), which combines the social identity approach (Tajfel, 1978; Tajfel & Turner, 1979; Turner, 1982) and self-attention theory (Carver & Scheier, 1982; Duval & Wicklund, 1972; Mullen, 1987) within an integrative framework, might therefore be better suited to explain these findings. When group members categorize themselves and others in terms of a higher order identity (e.g., as group members), they perceive themselves and others as depersonalized group members rather than unique individuals (Hogg, Hardie, & Reynolds, 1995; Turner, 1982). Group members who

categorize themselves and others as work group members regulate their behaviors in terms of this higher order identity (J. P. Meyer, Becker, & Van Dick, 2006; Van Knippenberg, 2000). Self-attention theory (Carver & Scheier, 1982; Duval & Wicklund, 1972; Mullen, 1987) further suggests that group members who are dissimilar experience heightened discrepancy between their own behavior and group standards, which they try to reduce, and as a result, may lead to higher levels of effectiveness via heightened motivation. This is in line with the positive paths found between deep-level dissimilarity and the various effectiveness related outcomes (i.e., task and contextual performance, and turnover) in the present study.

Moreover, the finding that social integration suppressed the above mentioned positive relationship may reflect the second process postulated by self-attention theory: expectancy-outcome assessments (Mullen, 1987). According to self-attention theory, this process occurs simultaneously with the discrepancy-reduction process. Particularly for dissimilar group members, it may give rise to negative outcome-expectancies. One potential reason for this could be that these group members are perceived as less prototypical and are consequently less liked and more likely to become socially excluded (Hogg et al., 1995; Turner, 1982). Due to these social constraints, these group members may have developed lower outcome-expectancies (Carver & Scheier, 1982), which would be in line with the negative indirect path between deep-level dissimilarity and the effectiveness related outcomes via social integration. Further exploring these simultaneous positive and negative effects within a social-self regulation framework seems worthwhile; as this would imply that diversity may not only lead to informational gains at the group level (van Knippenberg & Schippers, 2007) but also to motivational gains at the individual level.

Limitations and Directions for Future Research

Although our distinction between surface-level and deep-level forms of dissimilarity was theoretically informed and in line with previous research (see e.g., Harrison et al., 1998; Harrison et al., 2002; Phillips & Lloyd, 2006; Riordan, 2000), work group diversity researchers suggested the use of other typologies, such as distinguishing between task-related and relationship-related forms of diversity (Jackson et al., 1995) or between “variety”, “separation”, and “disparity” diversity dimensions (Harrison & Klein, 2007). At the time of conducting the present meta-analysis, it was not possible to explore whether these taxonomies are better suited to explain dissimilarity effects. But with more work continuing to be published within this area, future investigations of this nature may be possible.

In a similar vein, our results may be criticized on the basis that we combined different types of surface-level and deep-level dissimilarity variables together. This should be less problematic for deep-level dissimilarity variables, because there is usually a high association between people’s personality, values and attitudes (Judge, Heller & Mount, 2002; Roccas, Sagiv, Schwartz & Knafo, 2002). In contrast, surface-level dissimilarity attributes such as race/ethnicity and gender might be more salient in organizations than age and tenure, and therefore should elicit stronger social categorization effects in particular under low team interdependence (Chattopadhyay et al., 2004). To explore these ideas further we ran separate subgroup analyses for each of the outcomes. Our findings suggest that the effects for race/ethnicity and gender dissimilarity on social integration are indeed stronger than those for age and tenure dissimilarity (see Table A4). However, the direction of the moderating effects of team interdependence on age, tenure, gender, and race/ethnicity dissimilarity were similar to the ones we encountered for the average surface-level dissimilarity effects (i.e., more negative effects under low and less negative effects under high interdependence). The effects of age, tenure, gender, and

race/ethnicity dissimilarity on individual effectiveness related outcomes were slightly stronger for gender and race/ethnicity (see Table A5), however resembled the ones that we have found for the average surface-level dissimilarity effects. We therefore believe that lumping gender, age, tenure, and race/ethnicity together was justified, however we would encourage future research to consider demographic attribute salience as a potential moderator in their models.

Within the present study, our focus was placed on actual rather than perceived dissimilarity. While perceptions of dissimilarity may help to further clarify how actual dissimilarity affects work related outcomes (Lawrence, 1997; Riordan, 2000), too few studies were available to justify integrating into this meta-analysis. In accordance with our theoretical framework and findings, we would expect that perceived surface-level (or deep-level) dissimilarity operates as a mediator accounting for the negative effects found between actual surface-level (deep-level) dissimilarity and social integration when the respective surface-level (deep-level) dissimilarity variable is rendered salient under low (high) levels of team interdependence. Given the lack of studies looking at these relationships, future research should continue to explore the relationship between actual and perceived dissimilarity variables, including the effects of perceived dissimilarity on work related outcomes.

Finally, we caution that our data do not allow clear-cut cause effect conclusions as cross-sectional and time-lagged correlations cannot definitively establish temporal precedence (Balkundi & Harrison, 2006). Thus, while our theorizing would support the idea that surface- and deep-level dissimilarity caused individual effectiveness directly and indirectly via social integration (cf. Harrison et al., 1998; Harrison et al., 2002; Riordan, 2000), all of the primary studies were non-experimental. Future research could therefore replicate our findings in experimental settings in an attempt to establish better cause-effect relationships.

Managerial Implications

Even though effect sizes for surface-level and deep-level dissimilarity on social integration and individual effectiveness related outcomes appear to be rather small (range: $\gamma = -.05$ to $\gamma = -.28$) in light of Cohen's (1992) criteria, such effects may be of great importance in the real world nevertheless (cf. Rosenthal & Rubin, 1982). For instance, these effects may be of practical relevance when small increments in effectiveness have far-reaching consequences, such as when the cost of losing an employee is high (e.g., due to a lack of potential new employees or due to large training investments), and/or when social integration of *all* group members are essential for optimal team functioning, as is the case in highly performance oriented or high risk environments.

Managing the negative effects of surface-level dissimilarity on social integration and individual effectiveness related outcomes appears to be straightforward. Our results suggest that these negative effects can be overcome when managers succeed in establishing high team interdependence. This might be accomplished by introducing more teamwork in an organization (cf. Katzenbach & Smith, 1993), and within work groups by implementing a common vision, common goals, common group tasks, and common rewards (cf. van Knippenberg & Schippers, 2007). This seems to be particularly important when people differ from their peers in terms of their gender and race/ethnicity, because the negative effects of gender and race/ethnicity dissimilarity under low interdependence were much stronger than those for age and tenure dissimilarity.

Note, however, that these interventions can come at a cost, as they may just move the source that triggers the negative relational diversity effects to another level, in particular when surface-level dissimilarity attributes and deep-level dissimilarity attributes overlap. As the effects

of deep-level dissimilarity on social integration were stronger than the respective effects of surface-level dissimilarity, they call for more attention among practitioners, particularly in groups operating under high levels of team interdependence. Still, overcoming deep-level dissimilarity's negative effects on social integration seems to be particularly fruitful, as deep-level dissimilarity may also elicit direct positive effects on individual effectiveness related outcomes.

Based on our findings we suggest that managers should reassure dissimilar group member's social integration by facilitating dissimilar group member's satisfaction, attachment, and quality of social relations. This might be achieved by a mix of team and individual group member coaching that highlights dissimilar group members' unique talents, focuses on helping dissimilar group members learn to work well with their peers, resolves conflicts and improves interpersonal relationships between dissimilar group members and their peers, and encourages all team members to constructively resolve any problems that might develop among them (Wageman, Hackman, & Lehman, 2005). This way managers may harness group members' deep-level dissimilarity to increase their motivation and ultimately their and the work group's overall effectiveness.

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Footnote

¹To explore whether attachment, satisfaction and quality of social relations operated indeed as reflective indicators of the latent construct social integration; we compared all four models within each set (i.e. for surface- and deep-level dissimilarity) with measurement models in which attachment, satisfaction and quality of social relations were included as independent mediators. In all these cases overall model fit was poorer, and model fit indices were not very adequate (CFI < .9; RMSEA > .1; SRMR > .1).

Appendix

Table A1

Results of Meta-Analyses for Surface-Level Dissimilarity Effects

Variable	<i>k</i>	<i>n</i>	<i>SWM r</i>	ρ	<i>SDρ</i>	% var. acc. for	<i>Q</i>	<i>p</i>	95% CI	
									Lower	Upper
Attachment	20	6948	-0.03	-0.03	0.08	47.89	41.77	0.002	-0.08	0.01
High Team Interdependence	15	3412	-0.02	-0.02	0.08	49.23	30.47	0.007	-0.07	0.04
Low Team Interdependence	5	3536	-0.07	-0.08	0.06	58.25	8.58	0.072	-0.15	-0.01
Quality of Social Relations	17	4375	-0.06	-0.08	0.12	28.63	59.38	0.000	-0.14	-0.01
High Team Interdependence	8	2116	0.02	0.02	0.00	100.00	6.75	0.456	-0.03	0.06
Low Team	9	2259	-0.15	-0.17	0.11	32.32	27.84	0.001	-0.25	-0.08

Interdependence										
Satisfaction	16	7630	-0.03	-0.03	0.00	100.00	14.00	0.526	-0.06	0.01
High Team										
Interdependence	11	3716	-0.02	-0.02	0.00	91.47	12.03	0.283	-0.06	0.03
Low Team										
Interdependence	5	3914	-0.04	-0.04	0.00	100.00	1.51	0.825	-0.07	-0.01
Task Performance	26	26599	-0.03	-0.04	0.04	70.16	37.06	0.057	-0.07	-0.01
Contextual Performance	7	1769	-0.01	-0.01	0.00	100.00	3.52	0.741	-0.05	0.02
Turnover	11	15626	0.03	0.03	0.05	55.41	19.85	0.031	-0.02	0.08

Note. Results are corrected for criterion unreliability. k = number of correlations; n = number of respondents; $SWM r$ = sample weighted mean correlation; ρ = corrected population correlation; SD_{ρ} = standard deviation of the corrected population correlation; % var. acc. for = percentage of variance attributed to sampling error and artifact corrections; Q = homogeneity test of the ρ distribution; p = significance level of the Q – Statistic of the ρ distribution; 95% CI = 95% confidence interval of the ρ .

Table A2

Results of Meta-Analyses for Deep-Level Dissimilarity Effects

Variable	<i>k</i>	<i>n</i>	<i>SWM r</i>	ρ	<i>SDρ</i>	% var. acc. for	<i>Q</i>	<i>p</i>	95% CI	
									Lower	Upper
Attachment	5	1016	-0.07	-0.07	0.14	21.46	23.30	0.000	-0.21	0.07
High Team										
Interdependence	3	458	-0.11	-0.13	0.22	13.94	21.52	0.000	-0.39	0.14
Low Team										
Interdependence	2	558	-0.03	-0.03	0.00	100.00	0.04	0.849	-0.04	-0.02
Quality of Social										
Relations	7	1727	-0.17	-0.18	0.09	40.09	17.46	0.008	-0.26	-0.10
High Team										
Interdependence	4	870	-0.19	-0.21	0.05	71.68	5.58	0.134	-0.30	-0.12
Low Team										
Interdependence	3	857	-0.14	-0.15	0.01	28.11	10.67	0.005	-0.29	-0.02

Satisfaction	7	1395	-0.18	-0.21	0.16	19.18	36.49	0.000	-0.34	-0.08
High Team										
Interdependence	5	996	-0.22	-0.25	0.17	15.60	32.05	0.000	-0.41	-0.08
Low Team										
Interdependence	2	399	-0.09	-0.10	0.00	100.00	0.71	0.398	-0.17	-0.03
Task Performance	6	3934	-0.01	-0.01	0.08	48.04	12.49	0.029	-0.10	0.08
Contextual Performance	4	787	0.03	0.03	0.00	100.00	3.44	0.329	-0.05	0.10
Turnover	3	1140	0.02	0.02	0.00	100.00	1.53	0.466	-0.03	0.07

Note. Results are corrected for criterion unreliability. k = number of correlations; n = number of respondents; $SWM r$ = sample weighted mean correlation; ρ = corrected population correlation; SD_{ρ} = standard deviation of the corrected population correlation; % var. acc. for = percentage of variance attributed to sampling error and artifact corrections; Q = homogeneity test of the ρ distribution; p = significance level of the Q – Statistic of the ρ distribution; 95% CI = 95% confidence interval of the ρ

Table A3

Results of Meta-Analyses for Quality of Social Relations

Variable	k	n	$SWM r$	ρ	SD_{ρ}	% var. acc. for	Q	p	95% CI	
									Lower	Upper
Attachment	10	3056	0.32	0.38	0.22	9.41	106.29	0.000	0.24	0.53
Satisfaction	17	9133	0.34	0.42	0.14	18.77	90.55	0.000	0.34	0.49
Task Performance	11	2395	0.21	0.23	0.19	14.37	76.52	0.000	0.11	0.35
Contextual Performance	8	1641	0.27	0.32	0.18	16.18	49.43	0.000	0.18	0.46
Turnover	5	1408	-0.17	-0.19	0.10	40.24	12.42	0.014	-0.31	-0.08

Note. Results are corrected for criterion unreliability. k = number of correlations; n = number of respondents; $SWM r$ = sample weighted mean correlation; ρ = corrected population correlation; SD_{ρ} = standard deviation of the corrected population correlation; % var. acc. for = percentage of variance attributed to sampling error and artifact corrections; Q = homogeneity test of the ρ distribution; p = significance level of the Q – Statistic of the ρ distribution; 95% CI = 95% confidence interval of the ρ .

Table A4

Results of Meta-Analyses for Surface-Level Dissimilarity Effects on Social Integration Moderated by Demographic Dissimilarity

Attribute

Variable	<i>k</i>	<i>n</i>	<i>SWM r</i>	ρ	<i>SDρ</i>	% var. acc. for	<i>Q</i>	<i>p</i>	95% CI	
									Lower	Upper
Age	13	6103	0.03	0.03	0.03	79.00	16.46	0.17	-0.01	0.07
High Team Interdependence	9	3758	0.04	0.04	0.00	100.00	8.05	0.43	0.00	0.08
Low Team Interdependence	4	2345	-0.01	-0.01	0.06	56.04	7.14	0.07	-0.10	0.09
Tenure	7	2816	0.02	0.02	0.11	34.84	20.09	0.00	-0.08	0.12
High Team Interdependence	3	471	0.08	0.09	0.06	69.59	4.31	0.12	-0.04	0.21
Low Team Interdependence	4	2345	-0.01	-0.01	0.11	29.98	13.34	0.00	-0.14	0.11

Gender	23	9104	-0.05	-0.06	0.07	47.06	48.87	0.00	-0.10	-0.01
High Team										
Interdependence	16	5347	-0.03	-0.03	0.07	47.38	33.77	0.00	-0.08	0.02
Low Team										
Interdependence	7	3757	-0.11	-0.12	0.02	90.26	7.76	0.26	-0.17	-0.06
Race	19	9989	-0.06	-0.07	0.10	30.98	61.33	0.00	-0.12	-0.02
High Team										
Interdependence	12	5042	-0.04	-0.04	0.07	47.17	25.44	0.01	-0.09	0.01
Low Team										
Interdependence	7	4947	-0.11	-0.13	0.11	24.90	28.11	0.00	-0.22	-0.03

Note. Results are corrected for criterion unreliability. k = number of correlations; n = number of respondents; $SWM r$ = sample weighted mean correlation; ρ = corrected population correlation; SD_{ρ} = standard deviation of the corrected population correlation; % var. acc. for = percentage of variance attributed to sampling error and artifact corrections; Q = homogeneity test of the ρ distribution; p = significance level of the Q – Statistic of the ρ distribution; 95% CI = 95% confidence interval of the ρ .

Table A5

Results of Meta-Analyses for Surface-Level Dissimilarity Effects on Individual Effectiveness Related Outcomes Moderated by Demographic Dissimilarity Attribute

Variable	k	n	AWM r	ρ	SD_{ρ}	% var. acc. for	Q	p	95% CI	
									Lower	Upper
Age										
Task Performance	4	1070	0.01	0.00	0.06	57.98	6.90	0.08	-0.08	0.09
OCB	7	9109	0.01	0.01	0.00	100.00	6.13	0.41	-0.03	0.05
Turnover	6	2282	0.07	0.07	0.08	34.82	17.23	0.00	0.00	0.15
Tenure										
Task Performance	6	8594	-0.03	-0.03	0.09	30.46	19.70	0.00	-0.11	0.05
OCB	-	-	-	-	-	-	-	-	-	-
Turnover	5	1856	0.05	0.05	0.00	100.00	3.05	0.55	0.01	0.09
Gender										
Task Performance	14	19715	-0.03	-0.04	0.08	43.35	32.30	0.00	-0.09	0.02

OCB	6	1640	-0.05	-0.05	0.09	34.96	17.16	0.00	-0.14	0.04
Turnover	4	9930	-0.02	-0.02	0.06	49.03	8.16	0.04	-0.10	0.06
Race/Ethnicity										
Task Performance	9	10450	-0.09	-0.11	0.05	63.05	14.28	0.07	-0.16	-0.05
OCB	3	1013	-0.02	-0.02	0.00	100.00	0.04	0.98	-0.03	-0.01
Turnover	2	3788	0.08	0.08	0.00	100.00	0.01	0.93	0.07	0.08

Note. Results are corrected for criterion unreliability. k = number of correlations; n = number of respondents; $SWM r$ = sample weighted mean correlation; ρ = corrected population correlation; SD_{ρ} = standard deviation of the corrected population correlation; % var. acc. for = percentage of variance attributed to sampling error and artifact corrections; Q = homogeneity test of the ρ distribution; p = significance level of the Q – Statistic of the ρ distribution; 95% CI = 95% confidence interval of the ρ .

Table 1

Meta-Analytic Correlations of Surface-Level Dissimilarity with Attachment, Satisfaction, Quality of Social Relations, Task Performance, Contextual Performance and Turnover at High and Low Team Interdependence

Variable	1	2	3	4	5	6	7
1. Surface-Level Dissimilarity							
High Team Interdependence							
ρ	-						
k							
n							
Low Team Interdependence							
ρ	-						
k							
n							
2. Attachment							
High Team Interdependence							
ρ	-.02	-					
k	15						
n	3412						
Low Team Interdependence							
ρ	-.08	-					
k	5						
n	3536						
3. Quality of Social Relations							
High Team Interdependence							
ρ	.02	.38	-				
k	8	10					
n	2116	3056					
Low Team Interdependence							

ρ	-.17	.38	-			
k	9	10				
n	2259	3056				
4. Satisfaction						
High Team						
Interdependence						
ρ	-.02	.60 ^a	.42	-		
k	11	112	17			
n	3716	39187	9133			
Low Team						
Interdependence						
ρ	-.04	.60 ^a	.42	-		
k	5	112	17			
n	3914	39187	9133			
5. Task Performance						
High Team						
Interdependence						
ρ	-.04	.18 ^a	.23	.30 ^a	-	
k	26	87	11	312		
n	26599	20973	2395	54471		
Low Team						
Interdependence						
ρ	-.04	.18 ^a	.23	.30 ^a	-	
k	26	87	11	312		
n	26599	20973	2395	54471		
6. Contextual						
Performance						
High Team						
Interdependence						
ρ	-.01	.25 ^a	.32	.28 ^a	.23 ^a	-
k	7	42	8	32	24	
n	1769	10747	1641	16348	9912	
Low Team						
Interdependence						
ρ	-.01	.25 ^a	.32	.28 ^a	.23 ^a	-
k	7	42	8	32	24	
n	1769	10747	1641	16348	9912	
7. Turnover						
High Team						
Interdependence						

ρ	.03	-.22 ^a	-.19	-.19 ^a	-.15 ^a	-.22 ^a	-
k	11	66	5	67	72	5	
n	15626	26296	1408	24566	25234	1619	
Low Team Interdependence							
ρ	.03	-.22 ^a	-.19	-.19 ^a	-.15 ^a	-.22 ^a	-
k	11	66	5	67	72	5	
n	15626	26296	1408	24566	25234	1619	

Note. All results are corrected for criterion unreliability. Turnover correlations were not corrected for base rate. ^aSource: Harrison et al. (2006). Correlations with no subscript reflect original analyses (see Tables A1 and A3 in the Appendix).

Table 2

Meta-Analytic Correlations of Deep-Level Dissimilarity with Attachment, Satisfaction, Quality of Social Relations, Task Performance, Contextual Performance and Turnover at High and Low Team Interdependence

Variable	1	2	3	4	5	6	7
1. Deep-Level Dissimilarity							
High Team Interdependence							
ρ	-						
k							
n							
Low Team Interdependence							
ρ	-						
k							
n							
2. Attachment							
High Team Interdependence							
ρ	-.13	-					
k	3						
n	458						
Low Team Interdependence							
ρ	-.03	-					
k	2						
n	558						
3. Quality of Social Relations							
High Team Interdependence							
ρ	-.21	.38	-				
k	4	10					
n	870	3056					
Low Team							

Interdependence						
ρ	-.15	.38	-			
k	3	10				
n	857	3056				
4. Satisfaction						
High Team						
Interdependence						
ρ	-.25	.60 ^a	.42	-		
k	5	112	17			
n	996	39187	9133			
Low Team						
Interdependence						
ρ	-.10	.60 ^a	.42	-		
k	2	112	17			
n	399	39187	9133			
5. Task Performance						
High Team						
Interdependence						
ρ	-.01	.18 ^a	.23	.30 ^a	-	
k	6	87	11	312		
n	3934	20973	2395	54471		
Low Team						
Interdependence						
ρ	-.01	.18 ^a	.23	.30 ^a	-	
k	6	87	11	312		
n	3934	20973	2395	54471		
6. Contextual						
Performance						
High Team						
Interdependence						
ρ	.03	.25 ^a	.32	.28 ^a	.23 ^a	-
k	4	42	8	32	24	
n	787	10747	1641	16348	9912	
Low Team						
Interdependence						
ρ	.03	.25 ^a	.32	.28 ^a	.23 ^a	-
k	4	42	8	32	24	
n	787	10747	1641	16348	9912	
7. Turnover						
High Team						

Interdependence							
ρ	.02	-.22 ^a	-.19	-.19 ^a	-.15 ^a	-.22 ^a	-
k	3	66	5	67	72	5	
n	1140	26296	1408	24566	25234	1619	
Low Team							
Interdependence							
ρ	.02	-.22 ^a	-.19	-.19 ^a	-.15 ^a	-.22 ^a	-
k	3	66	5	67	72	5	
n	1140	26296	1408	24566	25234	1619	

Note. All results are corrected for criterion unreliability. Turnover correlations were not corrected for base rate. k = number of correlations; n = number of respondents; ρ = corrected population correlation. ³Source: Harrison et al. (2006). Correlations with no subscript reflect original analyses (see Tables A2 and A3 in the Appendix).

Table 3

Model Comparisons

	χ^2	<i>df</i>	RMSEA	SRMR	CFI
Models for Surface-Level Dissimilarity ^a					
Model 1a (Full Mediation, Moderation)	782.79***	41	.05	.04	.92
Model 1b (Full Mediation, No Moderation)	793.20***	42	.05	.04	.92
Model 2a (Partial Mediation, Moderation)	777.30***	38	.05	.04	.92
Model 2b (Partial Mediation, No Moderation)	787.70***	39	.05	.04	.92
Models for Deep-Level Dissimilarity ^b					
Model 1a (Full Mediation, Moderation)	440.06***	41	.05	.05	.91
Model 1b (Full Mediation, No Moderation)	458.91***	42	.05	.05	.90
Model 2a (Partial Mediation, Moderation)	359.55***	38	.05	.04	.93
Model 2b (Partial Mediation, No Moderation)	377.73***	39	.05	.05	.92

Note: ^aResults are based on multiple-sample structural equation modeling analyses. *n* for “High Team Interdependence” subsample = 4236 (Harmonic Mean). *n* for “Low Team Interdependence” subsample = 4283 (Harmonic Mean). ^bResults based on multiple-sample structural equation modeling analysis. *n* for “High Team Interdependence” subsample = 2101 (Harmonic Mean). *n* for “Low Team Interdependence” subsample = 1888 (Harmonic Mean).

*** $p < .001$.

Figure Caption

Figure 1. Hypothesized processes linking surface-level and deep-level dissimilarity to social integration and individual effectiveness related outcomes

Figure 2. Model 1a (full mediation, moderation) for surface-level dissimilarity effects. Results are based on multiple-sample structural equation modeling analyses. n for “High Team Interdependence” subsample = 4236 (harmonic Mean). n for “Low Team Interdependence” subsample = 4283 (harmonic Mean). * $p < .05$. ** $p < .01$. *** $p < .001$.

Figure 3. Model 2a (partial mediation, moderation) for deep-level dissimilarity effects. Results are based on multiple-sample structural equation modeling analyses. n for “High Team Interdependence” subsample = 2101 (harmonic Mean). n for “Low Team Interdependence” subsample = 1888 (harmonic Mean). * $p < .05$. ** $p < .01$. *** $p < .001$.

