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Benefiting from deep-level diversity: How congruence between knowledge and decision rules improves team decision making and team perceptions

Floor Rink¹ and Naomi Ellemers²

Abstract
In two experiments we show how teams can benefit from the presence of multiple sources of deep-level task-related diversity. We manipulated differences (vs. similarities) in task information and personal decision rules in dyads (Study 1) and three-person teams (Study 2). The results indicate that when both sources of diversity are present, partners and team members integrate their unique knowledge and decision rules into the collaboration and report perceptions of common interests, commitment and outcome satisfaction afterwards. This is not the case when there is just one source of diversity, causing the partners and team members to possess different information, but endorse similar decision rules or vice versa. The results are discussed in light of research on congruency and identity processes.

Keywords
congruency, decision rules, deep-level diversity, information, team perceptions, team processes

There is a growing number of work situations in which diverse teams are responsible for achieving collective goals. Not only does the current workforce represent people who differ from each other in terms of demographic characteristics (e.g., in ethnicity or gender; also referred to as salient surface level differences), team members often also differ from each other in knowledge, skills and abilities (i.e., reflecting underlying, deep-level task-related differences; Harrison, Price, Gavin, & Florey, 2002; Pelled, Eisenhardt, & Xin, 1999). Researchers have invested a lot of effort in understanding the positive and negative consequences of the highly visible surface-level sources of diversity for team functioning (see van Knippenberg & Schippers, 2007). Yet the goal of the present paper is to examine the conditions

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under which the less visible, or deep-level sources of task-related diversity affect team processes and perceptions. This will inform organizations how to manage multidisciplinary teams in which members are explicitly brought together with the purpose of learning from each other’s task-related differences. The most commonly examined deep-level source of task-related diversity is that of the differences between team members in the task information that they possess (Wittenbaum, Hollingshead, & Botero, 2004). The recognition of informational differences during decision-making processes has often been examined in isolation, or in combination with sources of surface-level diversity such as familiarity or gender (e.g., Gruenfeld, Mannix, Williams, & Neale, 1996). Unfortunately however, inferences about informational differences on the basis of such indirect surface-level sources have shown to be subject to error, and often result in stereotypical beliefs (Krueger & Rothbart, 1988). It is therefore important to examine under which conditions team members are able to detect this deep-level source of diversity on the basis of more objective cues that matter for effective decision making (i.e., similarities or differences on other relevant deep-level task-related sources).

One other important deep-level source of task-related diversity that members often bring to the team is that of the differences in their personal decision rules (i.e., individual mental models or schemas on how to perform a decision-making task; Gigone & Hastie, 1993; Kaplan & Miller, 1987). Relatively little is known about the way this last source of diversity affects team functioning, or about the joint presence of differences in task information and personal decision rules in teams. We aim to fill this gap by examining how the two deep-level sources of task-related diversity reciprocally and independently affect decision-making processes and perceptions in dyads and teams. Our goal is to contribute to recent insights on congruency and social identity processes (e.g., Phillips, 2003; Rink & Ellemers, 2007) by showing that when both deep-level sources of task-related diversity are present, the differences among the partners or team members reflect congruence, and become clearly recognizable. As a result, both differences will actually be integrated into the decision-making process, and will go hand in hand with positive perceptions. This is less the case when the partners or team members are in the incongruent situation in which they differ in information, but use similar decision rules, or vice versa.

**Differences in information and personal decision rules**

Differences in information and decision rules are both important sources of deep-level diversity, as they reflect differences in personal knowledge and cognitive decision schemas which are not immediately salient to other people. These differences generally do not become apparent when team members first meet each other and usually only emerge over time (Harrison et al., 2002). Nevertheless, both sources of diversity are important for team decision making as they are highly task-related. The kind of task information that team members possess reflects what they are able to contribute to the team’s final decision outcome (Stasser & Titus, 1985), and their personal decision rules influence the way they process this task information (Hinsz, 1990). Both sources of deep-level diversity essentially reflect a *variety* in task resources that the team can bear upon, and can potentially lead team members to complement each other in their work (Harrison & Klein, 2007). Importantly, although teams may be able to benefit from the availability of different information and/or decision rules, this does not always occur. In general, the mentioning and repetition of unique information is facilitated when (1) team members possess a relatively large amount of unique information (e.g., Stasser & Titus, 1985), (2) team members know who is likely to possess unique information in their team (e.g., Stasser, Stewart, & Wittenbaum, 1995), and (3) when informational differences are in line with initial expectations of team members (Phillips, 2003; Phillips, Mannix, Neale, & Gruenfeld,
All three conditions make it more likely that unique task information will be integrated into the decision-making process when team members indeed recognize that there are informational differences among them. The limited amount of research that exists on decision rules shows that people generally tend to start working together with whatever implicit decision rule they have in mind (Larson, Foster-Fishman, & Keys, 1994). The most commonly used rules are: (1) rank ordering all possible alternatives, (2) selecting the task information at hand that is most important for the decision, or (3) focusing on the positive and negative consequences of each alternative (Hollingshead, 1996; Janis & Mann, 1977; Kaplan & Miller, 1987). Even though the single use of one of these rules can in principle facilitate the decision-making process, it will also lead team members to process their information one-sidedly (Hinsz, 1990). The presence of different decision rules as a source of deep-level task-related diversity can reduce this biased information processing and thus enhance the quality of the final decision outcome. Yet again, it seems that this will only occur when team members also explicitly recognize this difference among them. The team members are then more likely to establish a collective all-embracing working procedure at the start of the collaboration (Jehn & Mannix, 2001), or to use each rule consecutively (Gigone & Hastie, 1993). To conclude, although teams are able to effectively integrate unique information or use different decision rules into the decision-making process, this is only the case when such sources of deep-level task diversity are recognized by team members. We argue that the recognition of the two deep-level sources of task-related diversity we examine is facilitated when the differences in information are congruent with differences in decision rules. Before we explain our reasoning, we will first discuss how the presence of both sources of diversity relates to perceptions of having common interests and feelings of commitment.

The importance of perceiving common interests and being committed

It is well established that perceptions of common interests and feelings of commitment are important for team decision making. People derive part of their identity from the groups they belong to (i.e., their social identity). This helps them give meaning to who they are and provides a basis for their self-esteem. As a result, people are willing to act on behalf of their group (Tajfel & Turner, 1986). In work situations, feelings of identification can be fostered by the conviction that team members are interdependent, have similar interests and are motivated to achieve valued collective goals (Rabbie, Schot, & Visser, 1989). The perception of having common interests is strongly related to feelings of group attachment (i.e., affective team commitment; Ellemers, Kortekaas, & Ouwerkerk, 1999). Furthermore, it generally determines satisfaction with team achievements (van Knippenberg & Schie, 2000). The assumption that agreement and similarity will facilitate perceptions of common interests, feelings of commitment and satisfaction suggests that any source of diversity might endanger team members’ evaluation of the collaboration (Harrison et al., 2002; Swann, Polzer, Seyle, & Ko, 2004). However, this proposition has not received unequivocal empirical support, at least in studies examining surface-level diversity (Earley & Mosakowski, 2000). The notion that diversity will automatically lead to negative team perceptions is also at odds with the findings described above (e.g., Stasser & Titus, 1985), showing that differences in information and/or decision rules can be beneficial for teams as long as these differences are clearly recognized by team members and reflect congruency. Thus, the presence of both sources of diversity does not necessarily preclude the possibility that team members still have similar ideas about what they need to accomplish together and agree upon their shared interests (Harrison & Klein, 2007). We therefore posit that differences in information and/or decision
rules among team members can coincide with their perceptions of having common interests and their feelings of commitment and outcome satisfaction. In the following section, we will explain when this situation is most likely to occur.

**Benefiting from multiple sources of deep-level task diversity**

Central to our argument is the notion that decision-making processes are highly dependent on the confirmation and reinforcement of expectations about interpersonal relations within a team (referred to as the experience of congruence, see Heider’s balance theory, 1958; Phillips, 2003; Rink & Ellemers, 2006). Congruency generally elicits instant positive feelings as it enables team members to focus on the task, rather than on reconciling their actual experience with earlier expectancies (Phillips & Lewin Loyd, 2006, p. 144). As a result, team members express their opinion more easily and generally evaluate the decision-making process more positively than when expectations are violated. Team members who experience incongruence often feel disappointed and generally attribute the violation of their expectations to the behavior of others (instead of to the self). This causes them to develop a negative attitude towards their team (Rink & Ellemers, 2007). Importantly, however, in newly-formed teams where members are not familiar with each other, it is difficult to develop clear expectations prior to collaboration. This is especially problematic for members of diverse teams, as they cannot easily define themselves in terms of their similarities (Tajfel & Turner, 1986). Recent studies on social identity formation suggest that under these circumstances, clarity about other possible sources that may constitute the basis for a common identity and shared understanding will help give meaning to the team (Scheepers, Spears, Doosje, & Manstead, 2003). This is why members of diverse teams search for alternative cues to form a picture of their team. For instance, we already pointed out that team members derive expectations about possible sources of deep-level task-related diversity (e.g., differences in information) from the presence of clearly noticeable surface-level differences (e.g., in gender; Phillips, Northerraft, & Neale, 2006). Such self-activated expectations generally motivate team members to work for their team (Rink & Ellemers, 2006). However, stimulating surface-level diverse teams to focus on their deep-level similarities can therefore actually backfire and undermine team performance as it emphasizes incongruence.

As expectations developed on the basis of surface-level sources of diversity often are erroneous, we want to take our research one step further. Our aim is to show that team members can also experience congruency and positively define their team solely on the basis of multiple sources of deep-level task-related diversity that are of direct importance for team decision making. The experience of congruency between these sources will trigger team members to recognize their existence as well, which will lead them to offer more unique contributions to the team (Earley & Mosakowski, 2000). This means that in our studies, collaboration partners and team members will openly discuss their differences in personal decision rules and actively integrate their unique information into the decision process when both sources of diversity are present, and will subsequently evaluate the collaboration process positively. We believe that this is less the case when the partners and team members are different in information, but similar in the decision rules that they use (or vice versa). In this latter situation, the experience of incongruence will make it more difficult for the partners and team members to recognize their single difference and to infer what is normative for the team (Phillips et al., 2006). Should they focus on the source that they share, or on the source in which they differ? **Such ambiguity makes it more difficult for the partners and team members to give meaning to their situation and therefore distracts them from focusing on their common interests (Rink & Ellemers, 2007).** To conclude, the core prediction of the present research is:

**H1:** Partners (Study 1) and team members (Study 2) will integrate more unique information and...
will discuss their similarities versus differences in decision rules more often during the collaboration when both sources of deep-level task-related diversity are present than when informational differences are incongruent with decision rule similarities or vice versa.

H2: Congruency in the presence (or absence) of both sources of deep-level task-related diversity will lead to positive perceptions of the collaboration. In the homogeneous baseline condition, and in the condition where the partners or team members differ in information and decision rules, there will be an increased focus on common interests and higher levels of commitment and task satisfaction compared to the conditions in which partners and team members differ in information or decision rules, but not in both.

Overview

In two experiments we manipulate deep-level similarities versus differences in the task information that people possess as well as in the decision rules that they prefer to use. Thus, our design includes two congruent conditions: the condition in which the two sources of deep-level diversity are present, and a baseline control condition (in which team members share the same information and decision rule preferences). There are two incongruent conditions in which only one source of diversity exists (either difference in information or in decision rules). Our experimental design enables us to control for the possible influence of other sources of surface-level diversity that may exist (i.e., gender, familiarity and organizational preferences; e.g., Gruenfeld et al., 1996) while examining the effects of the deep-level task-related differences. We observe features of actual interactions, and examine post-discussion perceptions of the collaboration. In Study 1, we examine information integration between two collaboration partners, and measure their perception of having common interests. In Study 2, we aim to replicate and extend these observations in three-person teams. We additionally assess the discussion of similarities versus differences in decision rules, and members’ self-reported feelings of commitment and satisfaction.

Study 1

Method

Design and participants We used a two (same vs. different task information) by two (same vs. different personal decision rules) between-participants design. Participants were 198 undergraduate students at a Dutch university who participated for course credit (n = 99 dyads, approximately n = 25 per condition). Students received individual information about the task before they were randomly assigned to a partner to come to a final joint decision.

Judgmental task Dyads worked on a judgmental decision-making task. They had to choose one out of three organizations to perform a joint internship. Each organizational profile represented six areas relevant to the selection of an organization: (1) strategic mission of the organization, (2) organizational culture, (3) required knowledge and experience for interns, (4) career development opportunities, (5) selection procedures and (6) employment conditions. A pilot study confirmed that there were no significant differences between the organizational profiles in informational importance, nor in their general attractiveness (the lowest p-value in a series of paired sample t-tests was t(29) = −1.38, p = .18).

Procedure Upon arrival in the lab, four students were seated at separate desks so that they could not see or communicate with each other. All task instructions, manipulations and organizational profiles were provided to them on paper. Participants were given 20 minutes to individually read the organizational profiles, and learned that it was not allowed to bring the sheets containing this information to the discussion. They were then divided into dyads and were each brought into their own discussion.
room where they received 15 minutes to select one of the three organizations. To obtain observational data from which information integration could be derived, we taped the discussions on digital video. The perception of common interests was assessed via an individual questionnaire after the discussion. We then also obtained possible sources of surface-level diversity (gender, familiarity and organizational preference). We had $n = 36$ mixed-gender dyads and $n = 63$ same-gender dyads. There were $n = 51$ dyads in which the partners knew each other and $n = 48$ dyads in which they did not. In $n = 49$ dyads, partners had the same organizational preference, whereas in $n = 50$ dyads, each had a different preference. After the experiment was finished, participants received their credits, were debriefed and thanked for their cooperation.

Manipulation of deep-level task-related sources

Decision rules We manipulated participants’ personal decision rules before they were given the organizational profiles. Participants randomly received one of two sets of instructions to select an organization (Janis & Mann, 1977). The content area rule encouraged participants to compare the organizational profiles on the basis of information they personally found most important before deciding which organization they preferred (e.g., selection procedures). The rank order rule encouraged participants to first rank the organizations from most favorite to least favorite before comparing them in terms of the specific information provided (Hollingshead, 1996). In the different decision rule condition, one partner received the content area rule, while the other received the rank order rule. In the similar decision rule condition, both partners received the same rule. There were $n = 22$ dyads with the content area rule, and $n = 27$ dyads with the rank order rule. To enhance internalization, participants had to complete short practice selections where they were guided step by step through the decision rule proposed to them. This enabled them to experience the effectiveness of the intended rule, and prepared them to use it while reading the organizational profiles. To check the effectiveness of our manipulation, participants had to indicate which of the following two statements applied to them: “I personally believe that I can make an effective decision when I compare the three organizations on the basis of the most important information” versus “I personally believe that I can make an effective decision when I compare the organizations on the basis of a rank order.” Almost all participants indicated the correct statement referring to the decision rule that we had induced (98%). To further check whether participants used their decision rule during the discussion, we coded whether they automatically started the interaction by mentioning an important content area or by presenting their rank order. This was the case for nearly all participants, as intended (97%).

Task information We used the information distribution paradigm to manipulate differences in task information (see Stasser & Titus, 1985). After the decision rule instructions, participants were told that each of them would receive a random selection of information about the organizations. Each organizational profile consisted of 15 informational items in total. In the different information condition, 40% of the items was unshared (each person possessed three unique items for each profile), and 60% was shared (nine items per profile). This way, all information was available at the dyadic level. As this manipulation of informational differences is very subtle (Wittenbaum et al., 2004), we followed the standard procedure of this paradigm and informed partners prior to the discussion that their profiles could vary (see e.g., Larson et al., 1994).

In the similar information condition, the information was not distributed among the partners, and they both received all profile items (100% shared). To make this similarity manipulation comparable to the diversity manipulation, we informed partners prior to the discussion that they could have received corresponding profiles. In both conditions, participants had to answer the following check: “The organizational profiles
are likely to vary somewhat between me and my partner” (1 = yes or 2 = no). As expected, 97% of the participants indicated the correct answer. Participants who had responded incorrectly to one of our manipulations were randomly distributed among the four experimental conditions.

Objective process measure

Integration of (unique vs. common) information

A reliable indicator of information recognition and integration is the number of common versus unique items repeated during the discussion (e.g., Oykhuysen & Eisenhardt, 2002). This measure clearly indicates the extent to which team members actually elaborate on the information that is mentioned and take it into account when making their joint decision. Two coders who were blind for the experimental conditions coded the dyads directly from the videotaped discussions. They scored each information item that was mentioned during a speaking turn. The coding of a random selection of 30 dyads indicated that the inter-rater reliability was $r = .83$. Any coding discrepancies were settled by discussion.

Team evaluation

The perception of common interests

Three items were developed to measure the perception of common interests: (1) “We focused on our common interests”, (2) “We discussed the issues that we both considered relevant” and (3) “It became clear that we are interested in similar issues” (1 = Not at all to 7 = Very much), $\alpha = .72$. The intraclass correlation coefficient (ICC) (1) for this measure indicated that the data of the members within each dyad were sufficiently interdependent (.26, $p < .05$; Bliese, 2000). We therefore performed the analysis of this measure at the dyadic level.

Sources of surface-level diversity

We calculated Blau’s index (1977) for each of the sources of surface-level diversity that could exist within the dyads. This index reflects the chance that the partners within a dyad differ in these sources. The values range from 0 (minimum level of diversity) to 1 (maximum level of diversity). The Blau’s index was $M = .19$, $SD = .14$ for gender; $M = .47$, $SD = .39$ for familiarity; and $M = .32$, $SD = .26$ for organizational preferences, and did not differ significantly across the four conditions (in all cases, $F < 2$, $ns$). We controlled for these indices in a series of regression analyses. They did not significantly predict our dependent measures (the lowest $p$-value was $t(42) = 1.69$, $ns$), nor did they change the impact of the two manipulated sources of diversity on these measures.

Results

Objective process measure

Overall information integration

A two (information) by two (decision rule) ANOVA on the total amount of repeated common and unique information yielded a significant effect, $F(1, 98) = 4.55$, $p = .035$, $\eta^2 = .05$. In general, dyads repeated a larger number of information items in the homogeneous baseline condition, $M = 12.88$, $SD = 7.38$, and in the congruent diversity condition in which they differed in both sources of deep-level task-related diversity, $M = 16.79$, $SD = 12.78$. Significantly less information was repeated when partners differed in decision rules but not in information, $M = 10.80$, $SD = 9.98$, or in the reversed situation, $M = 10.56$, $SD = 7.82$.

Unique information integration

An additional one-factor ANOVA showed that when partners differed in information and decision rules, a significantly larger proportion of this repeated information was unique (42% compared to 31% when the partners differed in information only), $F(1, 48) = 4.14$, $p = .048$, $\eta^2 = .09$. In this congruent diversity condition, each unique item was also repeated significantly more often, $M = 1.36$, $SD = 1.25$, than in the incongruent condition in which the partners differed in information, but used similar decision rules, $M = .70$, $SD = .55$, $F(1, 44) = 5.18$, $p = .028$, $\eta^2 = .11$. The number of times that a single common item was repeated did not differ across these two conditions.
Team evaluation

The perception of common interests  An ANOVA on the full experimental design revealed the predicted two-way effect, $F(1, 98) = 16.28, p < .001, \eta^2 = .15$. The perception of having common interests was relatively high in the condition where both deep-level task differences were present, $M = 5.40, SD = .69$, and did not differ from the homogeneous control condition, $M = 5.76, SD = .81$. By contrast, partners focused less on their common interests when they had different information but endorsed the same decision rule, $M = 4.77, SD = 1.13$, or vice versa, $M = 4.89, SD = .91$.

Study 2

The findings of Study 1 provide initial evidence for our notion that informational differences are integrated more easily when they are congruent or co-exist with another source of deep-level task-related diversity (in decision rules). Furthermore, we show that this situation can go hand in hand with a positive team evaluation, as expected.

The purpose of Study 2 is to replicate and extend these findings by testing our central prediction in three-person teams, and by assessing additional measures to more fully examine how the two sources of deep-level task-related diversity mutually affect team decision making. First, we now also observe whether team members also explicitly discuss their similarities versus differences in personal decision rules. Secondly, we additionally measure feelings of team commitment and team members’ satisfaction with their final decision outcome, as these are highly important for the long-term performance and longevity of the team (Ellemers et al., 1999). This also enables us to examine the argument that the perception of common interests determines satisfaction with team achievements, as a focus on their common interests motivates team members to search for a decision outcome that satisfies the entire team (van Knippenberg & Schie, 2000). We therefore predict that the perception of having common interests will mediate the influence of the two deep-level task differences on outcome satisfaction. More specifically, we hypothesize that:

$H3$: Because team members are more focused on their common interests in the homogeneous baseline condition and in the congruent diversity condition (where both sources of deep-level task-related diversity exist) than in the incongruent diversity conditions (in which only one source of diversity exists), they will also be more satisfied with their final decision outcome.

Method

Design and participants The experimental design and procedure was similar to Study 1. This time however, participants received all task information individually via computers that were placed in separate cubicles before they met with their fellow team members. In total, 213 undergraduate psychology students ($n = 71$ teams, approximately $n = 18$ per condition) from a Dutch university participated in the experiment for course credits. There were $n = 38$ mixed-gender teams and $n = 33$ same-gender teams. In $n = 30$ teams, members were familiar with each other. This was not the case in $n = 41$ teams. In $n = 19$ teams, members had the same organizational preference. In $n = 52$ teams, at least one of the members had a different preference.

Manipulation of deep-level task-related sources

Personal decision rules This time, participants received one out of three sets of personal decision rule instructions. We additionally presented “the evaluation” decision rule, which encouraged participants to compare the organizational profiles in terms of their most important advantage and disadvantage before deciding upon the best organization (see Janis & Mann, 1977). In the different decision rule condition, each team member had received a different rule to work with. In the similar decision rule condition, there were $n = 11$ teams who received the content area rule, $n = 13$ teams with the rank order rule, and $n = 12$ teams with the evaluation rule. We added one statement to our decision rule check: “I personally believe that I can make an effective decision when
I compare the three organizations with each other on the basis of their most important advantage and disadvantage.” Again, almost all participants correctly indicated the statement referring to their personal decision rule (99%). Moreover, as in Study 1, most team members implicitly started using their decision rule at the onset of the discussion (90%).

Information In the different information conditions, each member now possessed two unique items for each profile (40% of the information among the team members, see Study 1).4 In the similar information conditions, each member received all information items. Nearly all participants answered our check for possible variance versus correspondence of information within the team correctly (99%). As in Study 1, participants who responded incorrectly to our manipulations were randomly distributed across the conditions.

Objective process measures For the repetition of information, the inter-rater reliability was $r = .85$. To examine the recognition and discussion of the personal decision rules, we now also rated the number of times team members explicitly referred to the fact that they were different from or similar to each other in this respect, $r = .98$.

Team evaluations In all four conditions, we measured the perception of common interests with the same items as in Study 1, $\alpha = .70$. We additionally used three items to measure people’s affective commitment to the team: (1) “I felt connected to the other team members during the discussion”, (2) “There was a good atmosphere during the discussion” and (3) “I felt comfortable with my fellow team members”, $\alpha = .70$ (Ellemers et al., 1999). We developed three items to measure outcome satisfaction: (1) “I feel satisfied with the final decision that we made”, (2) “I am happy with our joint decision” and (3) “I feel good about the organization that we have chosen”, $\alpha = .97$. Answers were recorded on seven-point scales (1 = Not at all to 7 = Very much). A Principal Components Analysis with Varimax rotation confirmed that the three perceptual measures loaded on different factors, together accounting for 75% of the variance in the individual items (eigenvalues $\geq 1$). The ICC(1)’s indicated the interdependence of the data within teams ($r_{16} = .04$, for perceptions of common interests, $r_{17} = .02$, for commitment and $r_{27} = .03$, for outcome satisfaction). We therefore averaged the scores of individual team members and performed all further analyses at the team level.

Results

Sources of surface-level diversity

We again calculated the Blau’s index for each of the sources of surface-level diversity. As expected, these indices did not differ significantly between the experimental conditions, $M = .17$, $SD = .15$ for gender; $M = .23$, $SD = .22$ for familiarity; and $M = .62$, $SD = .41$ for organizational preferences, all $F$-values $< 3$, $n.s$.

This time, the familiarity index significantly predicted the perceptions of common interests, $\beta = .26$, $t(67) = 2.10$, $p = .03$, $R^2 = .07$, and satisfaction, $\beta = .22$, $t(67) = 1.97$, $p = .05$, $R^2 = .16$. Importantly, however, none of the three indices affected the influence of our information and decision-rule manipulations on the dependent measures.

Objective process measures

Discussion of similarities versus differences in decision rules We obtained a significant main effect for decision rules, $F(1, 70) = 23.62$, $p < .001$, $\eta^2 = .26$, qualified by an interaction effect across the four conditions, $F(1, 70) = 10.38$, $p = .002$, $\eta^2 = .13$. In general, team members discussed differences in decision rules more often than similarities: $M = 3.87$, $SD = 2.50$, in the homogeneous baseline condition and $M = 1.22$, $SD = 1.35$ in the similar decision-rule condition. Importantly though, team members discussed their differences in decision rules the most when they had also received different task information, $M = 5.06$, $SD = 2.66$ (vs. $M = 2.67$, $SD = 2.33$, when they differed in decision rules only).
Overall information integration This time, there were no significant differences between the four conditions in the total amount of (common and unique) information items that were repeated during the team discussions. On average, groups repeated $M = 11.55$, $SD = 6.50$ information items, $F(1, 70) = 1.60$, $ns$. One possible explanation for the fact that this pattern does not fully converge with the results of Study 1 is that decision-making processes often become more complex when group size increases (Wittenbaum et al., 2004). In our studies, both dyads and teams were given the same amount of discussion time to come to a final decision. This implies that teams were in fact left with relatively less time to integrate all information into the discussion than the dyads.

Unique information integration Importantly, in the two different information conditions, we again found that a larger proportion of the repeated items was unique when team members differed in information and decision rules (45% vs. 29% when they differed in information only), $F(1, 34) = 7.34$, $p = .011$, $\eta^2 = .19$. As in Study 1, these unique items were also repeated significantly more often in the congruent diversity condition, $M = .57$, $SD = .22$, than in the incongruent diversity condition, $M = .16$, $SD = .08$, $F(1, 34) = 56.14$, $p < .001$, $\eta^2 = .63$. Again, the number of times that a single common item was repeated did not differ across the two conditions.

Team evaluations Two-by-two ANOVAs revealed the predicted significant interaction effects for all three evaluative measures (see Table 1 for relevant statistics). When both sources of deep-level task diversity converged (as was the case in the homogeneous control condition), team members perceived more common interests, felt more committed to their team and were more satisfied with their final decision outcome than when the two sources of deep-level diversity were incongruent (i.e., when informational differences were paired with decision rule similarities, or vice versa).

Mediation analysis To test whether the level of outcome satisfaction depends on the perception of common interests, we conducted a series of regression analyses (Baron & Kenny, 1986). The interaction of our manipulated two deep-level task-related sources, $\beta = .31$, $p < .001$, $R^2 = .09$, and the perception of common interests, $\beta = .53$, $p < .001$, $R^2 = .27$, both emerged as independent predictors of outcome satisfaction. Yet, when the two predictors were simultaneously entered into a single equation, the perception of common interests remained a significant predictor, $\beta = .49$, $p < .001$, while the interaction term was no longer significant, $\beta = .09$, $p = ns$, $D\beta = -.23$, $R^2 = .29$, $z = 4.24$, $p < .001$. Thus, the presence of both sources of diversity caused team members to focus on their common interests which in turn led them to feel more satisfied with their decision outcome (see Figure 1).

Discussion Our observational data of the decision process and perception measures show the same pattern of results as in Study 1. Importantly, when team
members differed in both deep-level sources of task-related diversity, they were more likely to actively integrate unique information into the decision process, and explicitly discussed their differences in decision rules more often. At the same time, they strongly focused on their common interests, and reported high levels of team commitment (just as in homogeneous control teams). This was significantly less so when the two deep-level sources of diversity were incongruent. Importantly, we also found support for our prediction that team members feel more satisfied with the final decision outcome, because they focus on common interests during the decision-making process. Thus, congruence between differences in information and decision rules enables team members to integrate these differences and to focus on their common interests. This in turn allows them to reach a decision that is more satisfactory than that of the team members who are different in one source, but similar in the other, as this incongruent situation makes it more difficult for them to focus on their common interests.

**General discussion**

In this paper, we sought to demonstrate that teams will most easily benefit from deep-level sources of diversity when they are congruent within a team. We tested the validity of this reasoning by comparing the singular and combined influences of two sources of deep-level task-related diversity; differences in task information and differences in decision rules among collaboration partners (Study 1) and team members (Study 2). In general, the pattern of results for both experiments converges and is consistent with our central theoretical argument. The very fact that multiple sources of deep-level task-related diversity are present at the same time makes it more likely that team members recognize that they are different, and helps them realize what their team is about and how they relate to each other and their joint task. As a result, they evaluate their team just as positively as members of teams in which such differences do not exist. By contrast, it is more difficult for team members to make sense of their collaboration when there is incongruence as they are partly different from and similar to each other in deep-level task-related sources at the same time. The resulting lack of clarity about their common interests causes them to evaluate the team and the joint decision they reach less positively.

**Theoretical implications**

As far as we know, this research is the first to examine the combined effects of two deep-level
task-related differences on team decision making and team perceptions. A first important implication of this research is that sources of deep-level task diversity can indeed influence teams independently of surface-level diversity. Compositional and social category differences become less important when group members are able to form a more detailed impression of their partner or team members due to the experience of congruence. When the sources of deep-level task-related diversity become recognizable, team members can develop accurate expectations about the interaction and can overcome their stereotypical beliefs about others that are otherwise based on peripheral surface-level sources of diversity (Kunda & Sherman-Williams, 1993). Second, the findings advance current insights on identity formation in small work teams. Such teams are interactive by nature and members therefore tend to form a common identity on the basis of their individual actions on behalf of the team (Postmes, Spears, Lee, & Novak, 2005). As indicated in the introduction, identity researchers have recently suggested that—if a team cannot be easily defined in terms of interpersonal similarities—it is important that there is clarity about the actions of team members that can form the basis of a common identity (Scheepers et al., 2003). We provide concrete evidence for this notion by showing that team members prefer a congruent situation over an incongruent situation, even if this means that members differ from each other in multiple deep-level task-related ways. In this situation, members indeed remain attached to their team and consider the expression of self-descriptive, individuating behavior to be appropriate. Thus, our research suggests that when sources of deep-level task-related diversity are so evident that they cannot be ignored, team members naturally adapt a norm of individuality (even without specific training or explicit instructions; Jetten, Postmes, & McAuliffe, 2002; Postmes, Spears, & Cihangir, 2001) and can in fact even develop a common identity based on their capacity to relate and use their unique insights for the attainment of team goals (see also Reynolds, Eggins, & Haslam, 2003).

**Limitations and future research directions**

There are some remaining issues that would be worthwhile to examine in future research. First, although the consistency of our findings among the partners and three-person teams indicates the robustness of the phenomenon we observed, future research should examine whether the presence of informational and decision-rule differences is also beneficial for team decision making (and the formation of a common identity) in other (non-judgmental) task contexts. Second, we opted for experimental control to observe the influence of deep-level task differences on the actual behavior of team members during the decision-making process, while taking into account different sources of surface-level diversity. Yet, in the future, it is important to examine the robustness of our findings in more natural settings as well, to further assess how different sources of deep-level task-related diversity affect team decision making and team perceptions. Importantly, our findings show that the exact nature of the two sources of deep-level task-related diversity had less influence on the decision-making process than the singular versus combined presence of these sources within a team. Apparently, it does not matter whether team members have to deal with different task information or with different decision rules. Yet we believe that team members may experience more difficulty when they hold different perceptions of their common interests, and thus essentially pursue different work goals. Not only do people find it difficult to adjust to and learn from each other’s personal interests and beliefs (Harrison et al., 2002), such differences reflect separation and threaten the core of the team’s identity (Harrison & Klein, 2007; Haslam, 2001). Future research might therefore examine whether or not the awareness of this specific source of diversity is in fact still beneficial for team decision making and team perceptions. Finally, we acknowledge that in larger teams, often more complex dynamic processes exist. For instance, the presence of one or more sources of diversity may
result in dividing lines (i.e., fault lines) and split the team into subgroups (Lau & Murnighan, 1998). If this situation occurs, team members tend to experience conflict with those who do not belong to their own subgroup, and as a result are less motivated to invest in the team as a whole (e.g., Homan, van Knippenberg, van Kleef, & De Dreu, 2007; Rico, Molleman, Sanchez-Manzanares, & van der Vegt, 2007; Thatcher, Jehn, & Zanutto, 2003). Importantly though, the research conducted in this area shows that such fault lines are generally less likely to originate when there are many sources of diversity within a team, as it then becomes difficult for team members to align into homogeneous subgroups along all these sources. Thus, in larger teams too, the presence of multiple sources of diversity does not necessarily harm team decision making. Nevertheless, a logical next step would be to specifically examine whether the experience of congruency due to the combined presence of task-related differences will still result in positive team perceptions when members are able to align into subgroups (e.g., see Phillips et al., 2004 who focused on four-person teams).

Practical implications and conclusion

While it is generally believed that multifunctional teams will be successful in joint decision making, it has also been demonstrated that this is not always the case. It has been argued that deep-level task diversity may not even always be desirable because it easily remains unnoticed and can endanger the perception of common team interests. However, the present research shows that this is not necessarily the case, provided that different sources of deep-level diversity converge. We therefore argue that in order for organizations to benefit from deep-level task diversity, management should in fact emphasize the possible existence of multiple sources of diversity and create explicit awareness (e.g., by offering team-level diversity training) about the way unique knowledge and/or different norms of decision making can serve common team interests.

Notes

1. In both studies, the data within the similar decision rule conditions could be pooled to test our central predictions. A series of preliminary ANOVAs show that the teams with different decision rules did not respond differently on our dependent measures (the lowest p-value was $F(1, 98) = 1.99, p = .13$ in Study 1 and $F(1, 70) = 1.15, p = .29$ in Study 2).

2. A free recall task in which participants ($N = 20$) had to list as much information as they could remember across the experimental conditions. These participants recalled an average of 20.5 information items for the three organizational profiles. There were no significant differences between participants who had internalized different decision rules.

3. After our decision rule manipulations, we asked participants to what extent they were prepared to change their personal organizational preference ($1 = \text{Not at all} \text{ to } 7 = \text{Very much}$). In both studies, all participants were equally willing to do so, regardless of the decision rule they had internalized ($M = 4.08, SD = 1.16$ in Study 1 and $M = 4.47, SD = 1.29$ in Study 2).

4. In comparing information-sharing processes in teams of different sizes, it is more important to keep the percentage of unique information within those teams constant, than the number of unique items (Stasser & Titus, 1985).

References


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