Diversity in goal orientation, team reflexivity, and team performance

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ABSTRACT

Although recent research highlights the role of team member goal orientation in team functioning, research has neglected the effects of diversity in goal orientation. In a laboratory study with groups working on a problem-solving task, we show that diversity in learning and performance orientation are related to decreased group performance. Moreover, we find that the effect of diversity in learning orientation is mediated by group information elaboration and the effect of diversity in performance orientation by group efficiency. In addition, we demonstrate that team reflexivity can counteract the negative effects of diversity in goal orientation. These results suggest that models of goal orientation in groups should incorporate the effects of diversity in goal orientation.

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Introduction

Much of the behavior at work is goal-directed. Accordingly, differences in goal orientation – preferred goals in achievement situations (Dweck, 1986; Dweck & Leggett, 1988) – have been shown to exert a powerful influence on individual behavior and performance at work (e.g., Payne, Youngcourt, & Beaubien, 2007; Porath & Bateman, 2006). Given that teams and workgroups are often the primary unit of organization (DeShon, Kozlowski, Schmidt, Milner, & Wiechmann, 2004; Kozlowski & Bell, 2003) and the abundant evidence for the influence of goal orientation at the individual level, the question arises how goal orientation plays out in a group context. Only recently researchers set foot in this underdeveloped area (LePine, 2005; Porter, 2005), showing that mean levels of goal orientation affect group member attitudes and behavior. However, the shift from the individual level of analysis to goal orientation as a factor in team composition introduces another dimension yet unexplored in goal orientation research – diversity in goal orientation (i.e., differences between team members in goal orientation). In view of the evidence that diversity on a host of dimensions affects group process and performance (van Knippenberg & Schippers, 2007; Williams & O’Reilly, 1998), it is important for our understanding of goal orientation in teams to also study the influence of goal orientation diversity. Moreover, in view of the evidence that main effects are unable to capture the effects of team diversity (van Knippenberg & Schippers, 2007), we develop our analysis of diversity in goal orientations so that we are able to identify a moderator of its influence – team reflexivity (West, 1996).

Thus, we contribute to the literature in several important ways. Our main contribution lies in the demonstration of the importance of goal orientation diversity for team performance. We, thereby, further develop the goal orientation framework as well as extend research in diversity in at least two ways. By integrating insights from research in socially shared cognition with more traditional perspectives on diversity we extend research in diversity conceptually (cf. van Knippenberg & Schippers, 2007). Furthermore, our findings suggest that diversity in individual differences more proximal to behavior in achievement settings may be more influential than the personality factors most often studied in this area (i.e., the Big Five; Bell, 2007). Finally, by identifying team reflexivity as a moderator of the relationships between goal orientation diversity and group performance we both substantiate the shared cognition perspective underlying our analysis and point to a moderator variable that provides clear opportunities for the management of goal orientation diversity.

Goal orientation

Goal orientation is a predisposition to adopt and pursue certain goals in achievement contexts (Dweck & Leggett, 1988; Payne et al., 2007; VandeWalle, 1997). In this respect, a distinction is made between learning orientation and performance orientation (Dweck, 1986). Learning and performance orientation differ in the standards used to evaluate competence.
makes use of an absolute or intrapersonal standard (i.e., improve own past performance) and performance orientation draws on normative comparisons (i.e., outperform others; Elliot & McGregor, 2001; Elliot & Murayama, 2008). Goal orientation is mostly seen as a relatively stable trait that may be influenced by situational characteristics (Button, Mathieu, & Zajac, 1996; Murayama & Elliot, 2009). Although learning and performance orientation were originally seen as opposing poles (Dweck, 1986), researchers have argued that individuals often have multiple competing goals (Button et al., 1996). Indeed, research has shown that learning orientation and performance orientation are best portrayed as separate and largely independent dimensions1 (Button et al., 1996; Payne et al., 2007). Thus, people can be high (or low) in both learning and performance orientation.

Goal orientation has received a tremendous amount of attention of researchers at the individual level (Payne et al., 2007), but research has only recently started to explore effects of team composition on goal orientation on team functioning. Studies have shown that mean levels (i.e., the average of individual members’ goal orientation) of both learning and performance orientation are related to team functioning as evident in relationships with such concepts as team efficacy, backing-up behavior, team commitment, and team adaptation (LePine, 2005; Porter, 2005). However, these studies of mean level effects were unable to establish a relationship between team composition in goal orientation and team performance.

Previous studies of goal orientation in teams have essentially extrapolated hypotheses at the individual level to the team level, taking mean goal orientation as the team-level analogue of individual goal orientation. While the rationale for this approach is clear and supported by both research in goal orientation (DeShon et al., 2004) and research in individual differences in teams more generally (Barrick, Stewart, Neubert, & Mount, 1998; Bell, 2007), a focus on goal orientation in teams also introduces a dimension that has no analogue at the individual level of analysis: differences in goal orientation between team members – goal orientation diversity. The effects of diversity in goal orientation have been disregarded so far. In sharp contrast with this lack of attention, there is an abundance of evidence that diversity on a variety of dimensions ranging from demographic to individual differences may affect group process and performance (van Knippenberg & Schippers, 2007; Williams & O’Reilly, 1998). This literature, especially in combination with literature on sharedness and diversity in group members’ task representations and task mental models, clearly hints at the possibility that diversity in goal orientation influences group performance (Marks, Zaccaro, & Mathieu, 2000; Mohammed & Ringsius, 2001; van Ginkel, Tindale, & van Knippenberg, 2009). This suggests that to develop our understanding of the role of team composition in goal orientation, we need to pay attention to goal orientation diversity. As noted in the previous, trait learning and performance orientation are best portrayed as independent dimensions instead of as opposing poles. Accordingly, the study of diversity in trait goal orientation revolves around diversity in each dimension of goal orientation.

1 Goal orientation research has also adopted a subdivision between performance prove and performance avoid orientation – the former reflecting the disposition to prove one’s competence, the latter reflecting the disposition to avoid displaying incompetence (Elliot & Harackiewicz, 1996; VandeWalle, 1997). As different goal orientations are orthogonal, however, they can be studied without necessarily incorporating all dimensions (cf. Bunderson & Sutcliffe, 2003). Consistent with the original formulation of goal orientation theory (Dweck, 1986) and with previous research on team composition in goal orientation that was the direct inspiration for the current study (LePine, 2005; Porter, 2005), we focused the present analysis on the primary distinction between learning and performance orientation (an issue we revisit in “Discussion”).

Diversity in goal orientation

Diversity in goal orientation may be classified as concerning deep-level diversity (e.g., personality and individual differences, attitudes and values; Harrison, Price, & Bell, 1998; van Knippenberg & Schippers, 2007). One of the major perspectives within the diversity literature, the social categorization perspective, sees diversity as a potential source of ‘us vs. them’ distinctions, where dissimilar others are categorized as ‘outgroup’. This may disrupt group process and performance. While such categorizations are not limited to demographic categories, they are more likely for categories for which individuals hold well-developed stereotypes (Fiske, 1998), which is a condition that would seem highly unlikely to hold for deep-level differences in goal orientation. The social categorization perspective thus seems less suited to understand the influence of goal orientation diversity.

The similarity/attraction perspective holds that individuals are more attracted to similar others. As a consequence, people in teams are more willing to collaborate with others similar to themselves and as a result interact more smoothly with these others, rendering homogeneity more conducive to group performance than diversity. The similarity/attraction perspective should readily apply to deep-level similarities and differences (Byrne, 1971), which suggests that diversity in goal orientation disrupts group performance by reducing the quality of team member interaction (i.e., communication and coordination). This prediction is well aligned with findings of positive relationships between deep-level similarity and communication and interaction in teams (Harrison et al., 1998; Mohammed & Angell, 2003).

The information/decision making perspective, in contrast, points to the potentially positive effects of diversity. Starting point for this perspective is the notion that differences between team members may be associated with valuable task-relevant differences in knowledge, expertise, and perspectives, which may expand the available information in diverse teams. While such differences in task-relevant knowledge are unlikely to be limited to functional dimensions of diversity (van Knippenberg, De Dreu, & Homan, 2004), they may be less prevalent for deep-level diversity and accordingly may only play a relatively modest role in the effects of goal orientation diversity. Moreover, a more recent integration of the different perspectives on diversity (van Knippenberg et al., 2004) suggests that social categorization and similarity/attraction processes may disrupt elaboration (i.e., exchange and integration) of diverse information and perspectives. This suggests that similarity/attraction processes associated with goal orientation diversity would render it less likely that groups would benefit from any task-relevant insights associated with diversity in goal orientation.

The social categorization, similarity/attraction, and information/decision making perspectives are the main perspectives on work group diversity and performance (van Knippenberg & Schippers, 2007; Williams & O’Reilly, 1998). Yet, there is another perspective on deep-level diversity in particular that is typically not recognized as a perspective on diversity (van Knippenberg & Schippers, 2007): the socially shared cognition perspective. Interestingly and importantly, we propose that this perspective is the most relevant to understand the influence of goal orientation diversity. Research in socially shared cognition puts group members’ mental representation of the task and the team center-stage in understanding team performance (DeChurch & Mesmer-Magnus, 2010; Marks et al., 2000; Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000; Mohammed, Ferzandi, & Hamilton, 2010; van Ginkel & van Knippenberg, 2008). Guiding principle here is the proposition that members’ mental representations of the task and the team guide team member behavior in group interaction and group task performance. Task representations (Newell &
Simon, 1972) or mental models (Rouse & Morris, 1986) represent people’s understanding of the task and how to best perform it. The importance of the concept of task representations lies in the proposition that individual’s engagement with a task is not a direct function of objective characteristics of the task but rather the consequence of their mental representation of the task.

Research in socially shared cognition has highlighted the importance of sharedness of representations/mental models (i.e., similarity between group members; cf. diversity) and how sharedness of representations/mental models may feed into team performance (e.g., Marks et al., 2000; Rentsch & Klimoski, 2001; van Ginkel & van Knippenberg, 2008). More specifically, low levels of sharedness of representations (i.e., diversity of representations/mental models) have been associated with breakdowns in coordination (e.g., Marks, Sabella, Burke, & Zaccaro, 2002; Mathieu, Heffner, Goodwin, Cannon-bowers, & Salas, 2005; Mathieu et al., 2000) and communication (e.g., Marks et al., 2000; Mathieu et al., 2000, 2005), resulting in lower team performance.

We propose that the key insight for the study of goal orientation diversity is that there are important linkages between goal orientations and task representations. Goal orientations reflect and follow from individuals’ understanding of the nature of ability, task achievement, and performance (Dweck & Leggett, 1988; Elliot & McGregor, 2001). As such, goal orientations are mental frameworks that represent what people value in achievement situations and therefore affect how they approach tasks and how they interpret and respond to achievement situations (Dweck & Leggett, 1988; VandeWalle, Brown, Cron, & Sclocum, 1999). Much like the perspective on task representations, goal orientation theory thus suggests that task cognitions and subjective task goals guide task execution.

Learning orientation engenders task strategies conducive to attaining an understanding of the task (cf. Dweck & Leggett, 1988). As a result, high learning orientation expresses itself in deep-level information processing (e.g., Dupeyrat & Mariné, 2005; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; cf. Chaiken & Trope, 1999). Performance orientation fosters task-execution strategies that maximize the chance of demonstrating high ability (cf. Dweck & Leggett, 1988). As a result, individuals higher in performance orientation focus on those aspects of the task that are perceived to be related to immediate performance (cf. Elliot & McGregor, 1999; Elliot, Shell, Henry, & Maier, 2005; Ford, Smith, Weissbein, Gully, & Salas, 1998). Moreover, performance-oriented individuals understand performance as flowing from ability rather than effort, and thus are more likely to favor low-effort task-execution strategies than individuals lower in performance orientation (Fisher & Ford, 1998).

Goal orientation theory and research has not conceptualized these differences in achievement goals and task strategies in terms of task representations (i.e., which also emphasize goals and strategies), but the parallels are clear. Accordingly, we may conceptualize goal orientation diversity as a dimension of deep-level diversity akin to diversity in task representations. We propose that diversity in goal orientation is associated with impaired communication and coordination, and thus with lower team performance. As it is sharedness (and not content) of task representations which is of concern here, we expect diversity in learning orientation and diversity in performance orientation to have similar effects even though they may relate to very different task representations. This is in line with the similarity–attraction perspective, where the nature (content) of the differences between team members also does not play a role in predicting the consequences of these differences.

In sum, drawing from literatures on deep-level diversity, shared cognition, and goal orientation, we argue that diversity in learning orientation as well as diversity in performance orientation have the potential to disrupt group dynamics and performance. From these literatures difficulties with coordination and communication arise as the key aspects of team functioning affected by goal orientation diversity. More specifically, we see these processes as being primarily reflected in group information elaboration (cf. effective task-relevant communication) and group process efficiency (cf. efficient coordination).

Group information elaboration is defined as the exchange, discussion, and integration of task-relevant information and perspectives (van Knippenberg et al., 2004) and has been identified as a key mediating process in the relationship between diversity and group performance (e.g., Homan, van Knippenberg, Van Kleef, & De Dreu, 2007; Kearney & Gebert, 2009; van Ginkel & van Knippenberg, 2008, 2009; cf. Dahlin, Weingart, & Hinds, 2005; Mesmer-Magnus & DeChurch, 2009). Information elaboration is a key process in any team task to the extent that the task has information processing, problem-solving, and decision making components. It is an especially salient concern in diverse groups, both because social categorization and similarity/attraction processes associated with diversity may disrupt elaboration and because information elaboration is the key process involved in mobilizing and using diversity as an informational resource (van Knippenberg et al., 2004).

As argued in the previous, diversity in learning orientation and performance orientation are associated with differences in task strategies and attention to information. That is, differences in goal orientation may lead group members to emphasize different information, to interpret information in reference to different goals, and to differ in the extent to which they desire to engage in in-depth processing. Research in shared task representations/mental models shows that such differences in task approach may impair communication between group members (e.g., Marks et al., 2000; Mathieu et al., 2005). The process of group information elaboration relies on the collective effort of group members to exchange, discuss, and integrate information. When different group members emphasize different types of information with different goals in mind (i.e., a focus on in-depth processing to reach a deep understanding vs. a focus on informational cues to apply decision heuristics), group members will be less likely to follow up on each others’ remarks and observations because they seem less relevant to the own informational perspective and processing goals. This in turn will discourage further attempts at exchanging and discussing viewpoints, because it signals that contributions to the discussion are less appreciated by the group (Edmondson, 1999). In effect, goal orientation diversity thus lowers group information elaboration, and as a consequence group performance.

The second group process that we propose is involved in the effects of goal orientation diversity is group process efficiency. Collaborative task performance requires coordination of efforts and contributions (i.e., including the integration of contributions; Kozlowski & Bell, 2003). When coordination is suboptimal it results in process losses (Steiner, 1972), which are associated with lowered performance (e.g., Brodbeck & Greitemeyer, 2000). Research in mental models shows that sharedness results in greater efficiency in coordination (Marks et al., 2000; Mathieu et al., 2005). Having a common frame of references in task execution allows group members to better anticipate each other’s behavior, which makes it easier to understand each other and align and integrate each others’ contributions (Cannon-Bowers & Salas, 2001). In contrast, in teams lacking shared representations coordination is often less smooth, requiring members to further explain, ask for, and clarify issues (Cannon-Bowers, Salas, & Converse, 1993; Espinosa, Lerch, & Kraut, 2004; Salas & Fiore, 2004). As this is likely to result in a more time-consuming group interaction (cf. Hambrick, Cho, & Chen, 1996), time to accomplish a task is a good proxy for group process efficiency (Brodbeck & Greitemeyer, 2000).

To illustrate this in reference to the process of information elaboration, group process efficiency reflects the time needed to accomplish a given level of elaboration.
Thus, as diversity in learning and performance orientation implies that contributions to collective performance are made from the backdrop of differences in mental frameworks, the coordination of contributions and efforts are more challenging, and thus less time-efficient. In any task context where time is limited (as usual for teams in organizations), lowered group process efficiency – conceptualized as time-efficiency – will go at the expense of the quality or quantity of group performance or both (cf. Jehn, 1997). Accordingly, we propose that group process efficiency is a second process mediating the relationship between diversity in learning and performance orientation, and performance.

Team reflexivity as a moderator

Diversity research suggests that diversity effects are highly contingent in nature and that a focus on ‘main effects’ is unlikely to adequately capture diversity’s influence (van Knippenberg & Schippers, 2007). We expect this to also hold for diversity in goal orientation. This is consistent with research in individual differences that argues that situational influences may inhibit, as well as invite, trait expression (Mischel, 1977; Tett & Burnett, 2003). An achievement situation may invite the expression of individual differences in goal orientation, but situational influences may also help align resulting differences and thereby prevent negative effects of goal orientation diversity. Thus, to further develop our conceptual analysis we focused on identifying a relevant moderator of the effects of goal orientation diversity. The additional benefit of this focus on a situational moderator is that it helps to identify opportunities for managerial intervention, increasing the applied relevance of our research.

Our analysis suggests that factors that may stimulate groups to come to a more shared understanding of the task should moderate the effects of dispositional differences in goal orientation. Therefore, we focused on a factor that has been argued to be particularly instrumental in creating shared understanding: team reflexivity (van Ginkel et al., 2009; West, 1996). Team reflexivity is defined as ‘the extent to which group members overtly reflect upon, and communicate about the group’s objectives, strategies, and processes, and adapt them to current or anticipated circumstances’ (West, Garrod, & Carletta, 1997, p. 296). Reflexivity thus differs from information elaboration, as reflexivity is focused on discussing ‘metalevel’ issues (i.e., taking a step back to evaluate group process, strategies, and objectives) and information elaboration is focused on processing task-relevant information.

Collectively reflecting on goals and strategies has been shown to be valuable for team functioning and found to relate to satisfaction, commitment, performance, and team innovation (e.g., Carter & West, 1998; Müller, Herbig, & Petrovic, 2009; Schippers, Den Hartog, Koopman, & Wienk, 2003; Tjosvold, Tang, & West, 2004). Researchers have argued that teams have a natural tendency to limit their reflexivity as they are inclined to keep to their customary routines (cf. Gray, 2007; West, 1996). However, reflexivity may vary widely across teams in organizations and is affected by contextual variables like team leadership or team training (Hirst, 1998; Müller, Herbig, & Petrovic, 2009; Schippers, Den Hartog, Koopman, & van Knippenberg, 2007). Reflexivity (i.e., discussing objectives, strategies, and processes) has been argued to be instrumental in surfacing and clarifying differences in task representations between team members. As differences in understanding of the task may go unnoticed and continue to negatively affect group processes, by bringing these differences to light reflexivity may help groups to reach a more shared understanding of task strategies and goals (van Ginkel et al., 2009). Thus, reflexivity seems particularly suited to overcome those issues that we identified as the root cause of the negative effects of goal orientation diversity. Building on our earlier proposition that diversity in learning orientation and diversity in performance orientation lower group performance because they imply lower shared understanding of the task situation at hand, we thus advance the hypothesis that team reflexivity attenuates this negative relationship. By helping to reconcile different perspectives on the task, team reflexivity may diminish goal orientation diversity’s negative relationship with group information elaboration and group efficiency. That is, we expect that information elaboration and group efficiency mediate the interactions of diversity in learning orientation and diversity in performance orientation with team reflexivity on group performance. In sum, we advance the following hypotheses.

**Hypothesis 1a.** Diversity in learning orientation is moderated by reflexivity in its relationship with group performance, such that it is more strongly negatively related to performance for non-reflexive groups than for reflexive groups.

**Hypothesis 1b and 1c.** The interaction between diversity in learning orientation and reflexivity on group performance is mediated by (b) group information elaboration and (c) group process efficiency.

**Hypothesis 2a.** Diversity in performance orientation is moderated by reflexivity in its relationship with group performance, such that it is more strongly negatively related to performance for non-reflexive groups than for reflexive groups.

**Hypothesis 2b and 1c.** The interaction between diversity in performance orientation and reflexivity on group performance is mediated by (b) group information elaboration and (c) group process efficiency.

We tested these hypotheses in an experiment with three-person groups working on relatively complex problem-solving tasks. This set-up allowed us to manipulate team reflexivity and thus to establish causality in the proposed role of reflexivity. Moreover, the controlled set-up made it possible to assess group processes through relatively objective behavioral measures with high internal validity (Weingart, 1997).

**Method**

**Participants and design**

Participants were 147 students from a university in The Netherlands, assigned to 49 three-person groups. One group had to be eliminated from the study due to logistical errors. The mean age of the participants was 20 (SD = 1.83) and 66.7% were male. The majority of these participants were enrolled in business administration or economics (97%). A compensation of 15 € (approximately 18 USD) was paid out to participants. Groups were randomly assigned to either the reflexive or the non-reflexive condition and measures of learning orientation diversity and performance orientation diversity were added to the design as continuous variables.

**Task**

Groups worked on a collective rule induction task (Laughlin & Hollingshead, 1995). We selected this task, because it is a relatively complex problem-solving task that entails both performance and learning elements. Moreover, not only performance but also competence increase is feasible over the period in the lab, making both performance and learning orientation (a focus on competence increase) realistic for participants. Therefore, both learning and performance orientation should play a role in the task, which makes it
possible for diversity in learning and performance orientation to play out. Moreover, for an adequate test of reflexivity as a moderator, a task with multiple rounds was necessary. Collective induction entails a cooperative search for rules and principles, by observations of patterns and relationships and by testing and revising hypotheses (Laughlin & Hollingshead, 1995; cf. for example the work of scientific research teams and specialized medical teams). Groups were to discover a series of card sorting rules using a standard deck of 52 playing cards (e.g., Laughlin & Hollingshead, 1995; Laughlin, VanderStoep, & Hollingshead, 1991). Instructions explained that each sorting rule could be based on any attribute of the cards (e.g., suit, color, numerical and logical sorting rules, etc.) and several examples were given (e.g., red–black–red). The task consisted of four games, where in each game participants had to discover a new sorting rule. At the onset of each game the experimenter presented the group with a card that was in correspondence with the sorting rule. Each round started with participants thinking individually what they thought the sorting rule might be. Next, they were to come up with a group hypothesis about the rule through group discussion. Then, the group had to choose a card from the deck on which they wanted to receive feedback whether it fitted the sorting rule. Each round ended with feedback on the card by the experimenter. A maximum of 10 rounds (i.e., consisting of individual hypotheses, group hypothesis, playing a card, receiving feedback) and 10 min were given per sorting rule. After the 10th round or when the 10 min were up, groups were to write down their final group hypothesis. After this, the experimenter informed the groups about the correct rule. Then, groups started with the next sorting rule, until four rules were played.

Goal orientation

Goal orientation was measured using the validated 16-item questionnaire of Botton et al. (1996), with eight items measuring performance orientation (α = .71, M = 3.77, SD = .49) and eight items measuring learning orientation (α = .65, M = 3.98, SD = .38). Sample items include “The things I enjoy the most are the things I do the best” (performance orientation) and “The opportunity to learn new things is important to me” (learning orientation). The items were rated on a 5-point scale, ranging from 1 (completely disagree) to 5 (completely agree). Confirmatory factor analysis showed the intended two-factor solution had adequate fit to the data ($\chi^2 = 189.54, df = 103, GFI = .85, RMSEA = .08; Browne & Cudeck, 1993; MacCallum, Browne, & Sugarawara, 1996). Moreover, this model had a significant better fit than a one-factor solution: $\chi^2 = 283.47, df = 104, GFI = .78, RMSEA = .11; \Delta \chi^2 = 93.93, p < .001$ or an independence model $\chi^2 = 454.62, df = 120, \Delta \chi^2 = 265.08, p < .001$. To determine diversity in learning and performance orientation within teams, we calculated the standard deviations of the learning and performance orientation scores of all team members within each team (Harrison & Klein, 2007).

Experimental manipulation of reflexivity

Reflexivity was manipulated through written instructions. Reflexive groups were informed that to do well on the task it was important to discuss as much as possible how they are doing. Before starting on the task they were given 2 min to discuss the best approach to the task. In addition after each rule reflexive groups were given 1 min to discuss their team work, whether they used the right approach to the task, what caused mistakes to occur, and how they could do better. They were encouraged to use the given time fully for this purpose, and to continue to reflect during the task. In the non-reflexive condition groups were given no extra instructions. These groups were given 2 min waiting time before the first rule and 1 min after each rule.

Group performance, group information elaboration and group process efficiency

Group performance was operationalized as the total number of correct final group hypotheses, ranging from 0 (no correct final hypotheses) to 4 (all final hypotheses correct).

Group information elaboration was measured using audio–video recordings of 44 groups (four groups had to be omitted due to technical problems). A coding scheme was adjusted from van Ginkel and van Knippenberg (2008), rooted in concrete behavioral anchors, such as sharing possible solutions, discussing evidence for or against possible solutions, explaining trains of thought to other group members, remarks inviting information elaboration (e.g., “let’s keep our options open”, “what else could it be?”), and elaboration avoidant remarks (e.g., “just do whatever”, “it doesn’t matter anyway”). Two coders blind to the conditions rated the groups on information elaboration giving a score from 1 to 5, where a higher score represented more information elaboration. One coder rated all groups, and the second coder rated a subset of 30% of the groups to determine interrater reliability ($M = 2.99, SD = 1.17, r = .92$). As reliability was sufficiently high the ratings of the first coder were used in analyses.

Group process efficiency was operationalized following Brodbeck and Greitemeyer (2000) as the time (in seconds) taken for group discussion before deciding which hypothesis to write down and which card to play. Longer time reflects lower efficiency. Previous research suggests the independence of time-efficiency and information elaboration in group work (cf. Scholten, van Knippenberg, Nijstad, & De Dreu, 2007). Indeed, in the present study information elaboration and group efficiency were not related ($r = -.12, ns$). Moreover, our analyses enabled us to control for information elaboration when examining group efficiency and vice versa.

Manipulation check and controls

As a manipulation check for the reflexivity manipulation four questions were adjusted from Schippers, Den Hartog, and Koopman (2007; $M = 3.25, SD = .71, \alpha = .61$). A sample item is “As a group we reviewed various approaches to the task” (1 (completely disagree) to 5 (completely agree)).

In addition, we included a number of controls. We measured task liking using three items on a 5-point scale ranging from 1 (completely disagree) to 5 (completely agree). As task liking may vary greatly between people and may affect performance independently of our predicted effects, controlling for it allows us to filter out its influence on performance. A sample item is “I liked working on the task” ($M = 3.87, SD = .67, \alpha = .66$). For exploratory purposes, we included a more and a less difficult version of the task. Preliminary analysis indicated that while performance was lower on the difficult version of the task, task difficulty did not moderate any of the relationships of interest, rendering it essentially irrelevant to the current purposes. We included a dummy representing task difficulty as a control to reduce error variance. We also controlled for gender diversity to make sure our findings for goal orientation diversity were unrelated to potential gender differences.

We also added mean learning and performance orientation to the model. Previous studies have indicated that goal orientation is related to several team level variables and we were interested in effects of diversity in goal orientation independent of mean levels.2

2 As the task also has disjunctive elements we also tested whether the maximum level of learning and performance orientation exerted an influence on group process or performance. No significant effects of maximum goal orientation were found. As maximum levels of goal orientation correlated very highly with both mean and diversity in goal orientation we left them out of our final model to avoid issues of multicollinearity.
Moreover, inclusion of the mean learning and mean performance orientation also adds to the comparability with previous study findings (LePine, 2005; Porter, 2005).

**Procedure**

On arrival in the laboratory participants were seated separately and asked to fill out a questionnaire including a measure of goal orientation. When finished they read the instructions for the group task and in the reflexivity condition they were given the reflexivity instructions (see above). When all group members were finished reading the instructions, they were seated at one table as a group and the experimenter repeated the basic task instructions. In the reflexivity condition the reflexivity instruction was repeated and they were given 2 min to discuss how to approach the task. In the non-reflexive condition groups received no extra instructions and they were given 2 min to discuss how to approach the task. In the reflexivity condition the reflexivity instruction was repeated and they were given 2 min to discuss how to approach the task. In the non-reflexive condition groups received no extra instructions and were given their first exemplar after 2 min. Then groups started on the task as described above. After 5 min groups were warned that they had 5 min left. After each rule the reflexive groups were given 1 min to reflect and the non-reflexive groups waited for 1 min for the next game to start. After the final rule group members were seated separately again and were given a final questionnaire including manipulation checks and controls after which they were debriefed, thanked, and paid out for their participation. The entire experiment took approximately one and a half hours.

**Results**

**Preliminary analyses and manipulation check**

Table 1 displays all correlations. No significant correlations were found between the independent variables and control variables. Group information elaboration, group efficiency, task difficulty, and task liking were related to team performance. 

A wrg(1) values were calculated to check whether agreement on the manipulation check of reflexivity warranted analysis at the group level. A wrg(1) index has been proposed to overcome several limitations attached to the R og index (Brown & Hauenstein, 2005). A value of .85, well above the threshold of .70 (Brown & Hauenstein, 2005) was found, justifying group-level analysis. In addition, ICC values indicated group-level analysis was warranted (ICC1 = .18; ICC2 = .65). A regression analysis of the reflexivity manipulation check on all variables was performed. Only a main effect of the reflexivity manipulation was found (b = .37, p < .05), such that groups in the reflexive condition scored higher on the measure than groups in the non-reflexive condition. No interactions or other main effects were found. These findings indicate the effectiveness of the reflexivity manipulation.

**Hypothesis testing**

We used hierarchical multiple regression to test the hypotheses. Centered variables were used, following Aiken and West (1991). In the first step the regression model included the control variables, reflexivity (dummy coded −.5 and +.5), diversity in learning orientation, and diversity in performance orientation. Task liking was, as expected, positively related to group performance. No other main effects were found. In the second step the interactions of reflexivity with diversity in learning orientation and diversity in performance orientation were added. The second step had a significant added value over the model in the first step. Table 2 shows the results of these analyses.

As expected (Hypothesis 1a) we found moderation by reflexivity of the relationship between diversity in learning orientation and group performance (see Fig. 1). Next we performed simple slopes analysis, following Aiken and West (1991). For groups in the non-reflexive condition a negative relationship of diversity in learning orientation with group performance was found (b = −3.49, p < .01). For the reflexive groups a positive relationship between diversity in learning orientation and performance was found (b = 2.15, p = .36, p < .05). Moreover, for highly diverse groups (+1 SD) reflexivity had a positive relationship with performance (b = .78, p = .40, p < .05). Unexpectedly we found reflexivity to have a negative relationship with group performance for more homogeneous (−1 SD) learning oriented groups (b = −1.00, p < .01).

In line with Hypothesis 2a, an interaction was found between reflexivity and diversity in performance orientation on group performance (see Fig. 2). Simple slopes analysis showed that for non-reflexive groups diversity in performance orientation had a negative relationship with group performance (b = −2.73, b = −.63, p < .001). For the reflexive groups no relationship between diversity in performance orientation and performance was found (b = .70, p = .16, ns). Also, we found reflexivity to have a positive relationship with performance for groups highly diverse in performance orientation (b = .64, p = .33, p < .05). Finally, for groups with low diversity in performance orientation we found a negative relationship between reflexivity and group performance (b = −.86, p = .44, p < .01).

Until recently little attention had been paid to the methodology of simultaneous testing of multiple mediators (Preacher & Hayes, 2008). An obvious reason is the complexity of these models. However, simultaneous testing has some clear advantages over the testing of several simple mediations; it reduces parameter bias and it is possible to test whether specific mediators mediate the effect of x on y conditional on other mediators in the model. Therefore, Preacher and Hayes (2008) argue against using the causal
Table 2
Hierarchical regressions.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Step 1</th>
<th>Step 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(b)</td>
<td>SE (b)</td>
</tr>
<tr>
<td>Task difficulty</td>
<td>-.52</td>
<td>.26</td>
</tr>
<tr>
<td>Task liking</td>
<td>1.12</td>
<td>.31</td>
</tr>
<tr>
<td>Gender diversity</td>
<td>-.28</td>
<td>.64</td>
</tr>
<tr>
<td>Mean learning orientation</td>
<td>-.49</td>
<td>.57</td>
</tr>
<tr>
<td>Mean performance orientation</td>
<td>-.26</td>
<td>.48</td>
</tr>
<tr>
<td>Diversity in learning orientation</td>
<td>-.52</td>
<td>.79</td>
</tr>
<tr>
<td>Diversity in performance orientation</td>
<td>-.100</td>
<td>.57</td>
</tr>
<tr>
<td>Reflexivity</td>
<td>-.16</td>
<td>.26</td>
</tr>
<tr>
<td>Diversity in learning orientation exacerbated reflexivity</td>
<td>5.41</td>
<td>1.41</td>
</tr>
<tr>
<td>Diversity in performance orientation exacerbated reflexivity</td>
<td>3.29</td>
<td>.97</td>
</tr>
</tbody>
</table>

\(R^2 = .43^*\) for Step 1; \(\Delta R^2 = .20^*\) for Step 2.

\(N = 48\).
\(* p <.05\)
\(** p <.01\)

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steps method by Barron and Kenny (1986) for testing models with multiple mediators. In addition, the use of bootstrapping techniques is generally most appropriate for testing indirect effects, as the sampling distribution is rarely normal or symmetrical, violating the assumptions of the normal-theory tests for mediation (e.g., Preacher & Hayes, 2008; Shrout & Bolger, 2002). Bootstrapping is a non-parametric test, which does not require assumptions of normality of the sampling distribution. It involves repeated resampling from the dataset to estimate an empirical approximation of the sampling distribution of the indirect effects. Bootstrapping has been frequently used in former research to test for mediation (e.g., Giessner & van Knippenberg, 2008). Therefore, we used the Preacher and Hayes method for multiple mediation to test whether information elaboration and group efficiency mediated the interactions of reflexivity with diversity in learning orientation and diversity in performance orientation on group performance (Hypotheses 1b, 1c, 2b, and 2c). The method allows for simultaneous testing of direct and indirect (through mediators) effects of independent variables on the dependent variable. Full mediation can be concluded when the specific indirect effect of the interaction on the dependent variable through the mediator differs from 0 and the total (indirect + direct) effect of the interaction on the dependent variable differs from 0, but the direct effect of the interaction on its own does not differ from 0.

The specific indirect effect of the interaction of diversity in learning orientation with reflexivity on performance information elaboration was significant (point estimate = 1.54, SE = 1.04, 95% CI: .15–4.37) in line with Hypothesis 1b (see Fig. 3). However, the specific indirect effect through group efficiency was not significant (point estimate = .85, SE = .70, 95% CI = -.03 to 2.84), opposing Hypothesis 1c. The total effect (indirect + direct) of the interaction of diversity in learning orientation with reflexivity on performance differed from 0 (point estimate = 1.68, SE = 2.49, \(p < .001\)) and was stronger than the direct effect alone (point estimate = 3.45, SE = 1.39, \(t = 2.49, p < .05\), showing partial mediation.

Against expectations (Hypothesis 2b) no specific indirect effect of the interaction between diversity in performance orientation and reflexivity on group performance through information elaboration was found (point estimate = .37, SE = .50, 95% CI = -.45 to 1.68). However, the specific indirect effect through group efficiency was significant (see Fig. 4), in line with Hypothesis 2c (point

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Fig. 1. The interaction between diversity in learning orientation and team reflexivity on team performance.

Fig. 2. The interaction between diversity in performance orientation and team reflexivity on team performance.

Fig. 3. The interaction between diversity in learning orientation and team reflexivity on group information elaboration.
that are fundamentally different from the individual level due to differences on the team level, as on the team level additional issues come into play. Even so, the present findings indicate that one cannot simply extrapolate goal orientation research from the individual level to the team level, as the information elaboration processes by showing that the interaction for diversity in learning orientation was mediated by group information elaboration and the interaction for diversity in performance orientation was mediated by group efficiency.

Discussion

Recent findings in team research suggest that goal orientation not only has relevance for individual performance but also as a team composition variable (LePine, 2005; Porter, 2005). We add an important new dimension to this emerging field of research by demonstrating the influence of goal orientation diversity in teams. Results confirmed our proposition that diversity in learning orientation as well as diversity in performance orientation has a negative relationship with group performance, which can be counteracted by reflexivity. Also, results give insight into the underlying processes by showing that the interaction for diversity in learning orientation was mediated by group information elaboration and the interaction for diversity in performance orientation was mediated by group efficiency.

Theoretical implications

Our results demonstrate that diversity in goal orientation indeed plays a role in team functioning, and – in contrast to mean levels of goal orientation – also in team performance. Previous research has shown the value of mean goal orientation for group member attitudes and behavior, but no relationship with group performance was found (e.g., Porter, 2005). The fact that we found diversity in goal orientation to be related to group performance when mean goal orientation was not, tentatively suggests that goal orientation diversity may be a more important influence on team performance than the specifics of this goal orientation per se. Clearly, future replications and extensions are in order to bolster this conclusion. Even so, the present findings indicate that one cannot simply extrapolate goal orientation research from the individual level to the team level, as on the team level additional issues come into play that are fundamentally different from the individual level due to differences between team members. Thus, the findings seem to put a premium on the study of goal orientation in teams with attention to the influence of goal orientation diversity.

An interesting unpredicted outcome of the present study is that diversity in learning orientation was related to group performance through information elaboration, while diversity in performance orientation affected group performance through process efficiency. Thus, even though diversity in both orientations had similar relationships with performance, the disparity in mental frameworks between the orientations did play out in differing underlying processes. A possible explanation for these differential pathways may be found in differences between learning orientation and performance orientation at the individual level of analysis. Learning orientation more than performance orientation has been linked to differences in information processing, both in terms of the depth of processing and (by implication) in terms of the information to which individuals are likely to attend (e.g., informational cues that can be used in decision heuristics). We outlined in the introduction how such differences in emphasis would result in lower elaboration, and indeed this proposition was supported. While the basis for decisions may thus be poorer as a consequence of more shallow information elaboration, this need not express itself in lowered efficiency in coming to an agreement about task-relevant issues (cf. Kooij-De Bode, van Knippenberg, & van Ginkel, 2008; Scholten et al., 2007). Differences in performance orientation, in contrast, are less related to information processing but more to strategy preferences (e.g., Harackiewicz et al., 2000). Such differences may lower group process efficiency by increasing the difficulties in aligning different contributions, but they do not necessarily stimulate or impede discussion of decision-relevant information. That is, the differences in task approach associated with different levels of performance orientation are less likely to express themselves in the processing of information, and accordingly less likely to affect group information elaboration. Even so, they may reduce group process efficiency when they result in less successful or slower integration of contributions made from different strategic perspectives.

Diversity in learning orientation was found to relate positively to performance when groups reflected on their processes, goals, and strategies. This finding is in line with the information/decision making perspective, which argues that diversity may have positive consequences. Moreover, in a recent integration of the diversity literature researchers have proposed that diversity may contribute useful insights, but only when barriers to information elaboration have been removed (van Knippenberg et al., 2004). In our study the creation of a shared understanding through team reflexivity served this purpose. Interestingly, this positive relationship was only obtained for learning orientation diversity. This is consistent with the finding that only learning orientation diversity was related to information elaboration and with the proposition that information elaboration is the key process mediating the positive effects of diversity (van Knippenberg et al., 2004).

The finding that diversity in goal orientation plays an important role in team functioning demonstrates the role of goal orientation in social interactions. Relatively little attention has been paid to this area of research, and the present research adds to claims of the importance of this relatively new area in the literature (e.g., Darnon, Butera, & Harackiewicz, 2007; Janssen & van Yperen, 2004). Our study shows that goal orientation is not merely an intra-psychic phenomenon with effects occurring only within individuals, but has distinct intragroup effects. Interestingly and importantly, however, these effects do not obtain from goal orientation per se (i.e., mean goal orientation) but from differences in goal orientation.

The moderating effect of reflexivity suggests support for our claim that aligning task representations may help groups deal with diversity in goal orientation. Although we did not measure

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3 Bunderson and Sutcliffe (2003) examined team learning orientation as a team climate variable and found a curvilinear relationship with team performance. While their focus on team climate is distinct from the current focus on individual differences – including the mean of these individual differences – we explored the possibility that mean learning orientation had a curvilinear relationship with performance. This relationship was not significant.
sharedness of task representations, previous research has underlined the relationship between reflexivity and shared understanding of the task (van Ginkel et al., 2009). This implies that other variables that affect sharedness of task representations may also help in dealing with diversity in goal orientation. For example, variables that have been related to shared mental models may be of influence here, such as team size or team experience (Rentsch & Klimoski, 2001). In addition, leaders may instigate a shared mental model (cf. Kozlowski, Gully, McHugh, Salas, & Cannon-Bowers, 1996; van Ginkel & van Knippenberg, in press) and align task strategies, possibly decreasing effects of diversity in goal orientation. Also, as research has shown that goal orientation can be induced by situational characteristics (Button et al., 1996), stimulating similar (state) goal orientation within a team may be beneficial. Finally, the moderating effect of reflexivity implies that teams in situations which provide limited opportunities for discussion or interaction, such as virtual teams, may be more prone to suffer the negative consequences of goal orientation diversity.

With homogeneity in learning orientation as well as homogeneity in performance orientation, reflexivity was less beneficial. This is in line with previous research that unexpectedly found negative effects for reflexivity (De Dreu, 2002). De Dreu speculated that reflexivity may not affect team performance itself, but may serve as a moderator either causing constructive controversy and exploration of differing viewpoints leading to positive outcomes, or causing concurrence seeking and limited breadth of information search leading to negative consequences. Our study seems not only to validate his argument, but to take a step further by determining what circumstances may determine these alternative effects. It seems that discussing similar goals, strategies, and processes may have limited added value. Moreover, reflecting on similar goals and strategies may overly strengthen team members’ positions causing processes in line with groupthink, which diminish team performance (De Dreu, 2002; Janis, 1972). Positive effects of reflexivity may instead only occur when it is necessary to align group members, when constructive controversy over differing viewpoints may improve performance. Thus, in other words the effects of reflexivity may be moderated by ‘need for reflexivity’. This may be an important extension in the reflexivity literature.

The results of our study may also have implications for research in diversity in personality and individual differences more generally. Results in this domain have been remarkably inconclusive (Bell, 2007). A reason for this may be that the variables studied were often quite distal to behavior in achievement settings (i.e., primarily the “Big Five” factors of personality). Diversity of individual difference variables more proximal to behavior in achievement settings such as goal orientation may therefore have stronger effects. Accordingly, it may be worthwhile for future research in this domain to focus on such variables more proximal to behavior in organizations.

Limitations and suggestions for future research

The present study is not without limitations. Our study made use of a laboratory setting with a student sample. Although obvious benefits are increased control, evidence for causality, and relatively objective measurement of team process (i.e., through observation rather than retrospective self-rating) and performance, the use of a laboratory setting may raise questions concerning generalizability. However, previous studies have demonstrated that findings in the laboratory are often replicated in the field and there is no reason to expect students to differ from other populations in their behavior in achievement settings (e.g., Brown & Lord, 1999; Dipboye, 1990; Locke, 1986). The goal of the present study was not to demonstrate external validity, but to study underlying relationships for which a laboratory setting is most appropriate (cf. Brown & Lord, 1999; Mook, 1983). However, to address concerns some may have with issues of generalizability, replicating the present findings in the field would be valuable.

While the measure of goal orientation we employed (Button et al., 1996) is thoroughly validated and used by much recent research on the topic (e.g., DeShon et al., 2004; Porter, 2005), performance orientation may be subdivided into prove (or approach) and avoid dimensions (Elliot & Harackiewicz, 1996; VandeWalle, 1997; some argue the same holds for learning orientation, Elliot & McGregor, 2001, but this is considerably more controversial, e.g., DeShon & Gillespie, 2005). Our study does not speak to this distinction. A recent meta-analysis suggests that the measure of performance orientation we employed mainly concerns performance prove/approach orientation (Payne et al., 2007). Our study thus can be taken to speak to performance prove orientation, but does not speak to the influence of performance avoid orientation – the disposition to avoid being perceived as incompetent. The inspiration for our study was recent work on goal orientation in teams which worked from the two-dimensional distinction between learning and performance orientation (DeShon et al., 2004; LePine, 2005; Porter, 2005). Previous research found mainly this distinction to play a role in interpersonal settings (e.g., Poortvliet, Janssen, Van Yperen, & Van de Vliert, 2007). Moreover, our analysis focused on task representations as the focal underlying mechanism where differences in achievement standards are the focal concern, not differences in approach or avoidance motivation. As the dimensions of goal orientation are orthogonal, not including a performance avoid measure does not disqualify the current findings for learning orientation or performance (prove) orientation.

Nevertheless, examining effects of diversity in performance avoid orientation would have added value to research on goal orientation in teams. We would predict that our analysis extends to performance avoid orientation, as diversity in performance avoid orientation should also relate to differences in task representations. Therefore, diversity in performance avoid orientation may similarly relate to diminished group performance – unless teams create greater sharedness through reflexivity. Moreover, as performance avoid orientation holds similar achievement standards as performance approach orientation (i.e., normative), but like learning orientation has been related to deep information processing (but negatively; Elliot, McGregor, & Gable, 1999) both information elaboration and efficiency may be relevant mediating processes. Future research including the performance avoid dimension may not only validate this suggestion, but also examine whether our initial evidence for the greater impact of diversity compared to mean effects of team composition in goal orientation holds for all components. Considering the extensive negative consequences of performance avoid orientation, mean (or maximum) composition effects might be as large as or even overshadow diversity effects on this dimension. As previous research into team composition in goal orientation has also only included the main distinction between learning and performance orientation, studying all dimensions in future research seems desirable.

We developed our theoretical analysis around an integration of research in goal orientation and research in socially shared cognition. While shared cognition typically is not recognized as reflecting diversity (or rather, the reverse), the present support for our analysis corroborates the usefulness of conceptualizing deep-level dimensions of diversity like goal orientation in terms of task representations. We acknowledge that we did not establish this link between goal orientation diversity and (shared) task representations empirically, but derived it from the strong linkages between goal orientation theory and theories of task representations and mental models. Therefore, it would be valuable if further research would empirically establish the link between goal orientation and task representations, not only because it would provide further validation.
for the current analysis, but also because it would more firmly open the door for an integration of research in diversity and research in socially shared cognition. In this respect, it is important to realize that learning orientation and performance orientation capture different task representations, and accordingly that operationalizations should reflect this. An interesting, related question is whether a conceptualization in terms of task representations is also useful in understanding the influence of diversity in other deep-level dimensions, and potentially also of other types of diversity such as functional diversity which may be associated with different task representations through training and education rather than disposition.

Finally, the collective induction task employed in this study was selected because it contained both performance and learning elements. Although collective induction is an intellec†ive task, it requires the generation of hypotheses and thus creative problem-solving plays a role in task performance. Previous research has argued that diversity of opinions, expertise, and perspectives may be more helpful on these tasks (van Knippenberg et al., 2004; Williams & O'Reilly, 1998). Therefore, the positive effect of diversity in learning orientation might not have occurred on a task with less problem-solving requirements. Moreover, the detrimental effects of diversity in goal orientation may be more pronounced on different kinds of tasks. In contrast, effects of mean goal orientation may be more pronounced on tasks where either a high performance or high learning orientation is more clearly advantageous (e.g., a task for which adjusting to changed circumstances is highly relevant for team performance; cf. LePine, 2005) and we should be careful not to discard the possibility that mean levels of goal orientation may under specific circumstances affect team performance.

Managerial implications

Several studies have advanced the suggestion of selecting employees on the basis of goal orientation (e.g., Vandewalle et al., 1999). Based on the present study we would add that organizations may be well-advised to take into account the goal orientation of other team members when making selection decisions. When forming teams selecting team members with similar levels of goal orientation may be worthwhile. This is especially true when it is unlikely that the team will engage in high levels of reflexivity. Results of the present study may imply more generally that it is useful to base the profile of the ideal applicant (at least partly) on the team members he or she will be working with.

Moreover, our results show that reflexivity may counter the detrimental effects of diversity in goal orientation. Thus by stimulating team reflexivity organizations may attenuate the negative influence of diversity in goal orientation. This may be achieved through training teams to foster team reflexivity (Okhuysen & Eisenhardt, 2002) or by aligning task strategies by other means, for example by giving clear directions for the best strategy. In addition, although goal orientation is a relatively stable trait, it can be affected by situational factors (Button et al., 1996). Therefore, inducing a shared state goal orientation may help teams be more effective, for example by emphasizing the importance of learning or performance and competition, or by suitable compensation and feedback systems.

Conclusion

As organizations make more and more use of teams as their basic units, the study of what affects team functioning and performance is gaining in importance. Recent research has shown the important role of team composition in goal orientation for team functioning. The present study extends and develops this emerging literature by establishing the influence of diversity in goal orientation on team processes and performance. In addition, the identification of a means to counteract these effects opens up promising future research opportunities.

References


