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Rietzschel, Eric F.; Nijstad, Bernard A.

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Group Creativity

Eric F Rietzschel[a] **and Bernard A Nijstad**[b], [a] University of Groningen, Department of Psychology, Groningen, The Netherlands; and [b] University of Groningen, Faculty of Economics and Business, Groningen, The Netherlands

Group Creativity

Despite the persistent and often-cited stereotype of the 'lone genius', much creative work actually takes place in groups, teams, or other collaborative settings. This is especially true in organizations, where an increasing amount of work is organized in permanent or temporary teams (such as production teams, project teams, quality circles, etc.). It is also true in art (music, especially), science, sports, and any setting where something is to be gained by having multiple people work on a task together. Whereas creativity is usually defined as the generation of ideas that are both novel and useful, group creativity occurs when these creative ideas are the result of several people working together.

Properly organized, group work increases the amount of work that can be done, the amount of resources that can be drawn upon, and the efficiency with which it can be done. In terms of creativity, group work primarily means that creativity could benefit from the presence of a broader variety of knowledge, abilities, and traits. Furthermore, when group members are exposed to various inputs from other members, their creativity may be stimulated. Thus, group work can *stimulate* creativity to the extent that groups and their members manage to make use of (i.e., exchange and process) the information and perspectives available. In contrast, group creativity is *hindered* by factors that prevent groups from being creative either because information or ideas do not get shared or because they do not get processed and used within the group.

It should be noted that group creativity is not simply an aggregate of multiple individuals' creative behavior. Groups are *multilevel entities*, meaning that their performance as well as the influences on that performance can exist on multiple levels. Thus, group creativity may depend on certain factors at the individual level (e.g., individual traits and abilities, individual contributions to the group) and the group level (e.g., group size and structure, characteristics of the group task, group processes and performance). It will also depend on factors at even higher levels of analysis, such as the organizational (e.g., organizational culture or mission, reward structures) or even the societal level (e.g., social norms, national culture, economic circumstances). Further, variables on higher levels will feed into lower-level variables (as well as vice versa): The individual creative behaviors of group members will be influenced by group-level variables such as task structure, group size, and group climate. For example, people working in a large group, where individual members' contributions are not identifiable, may be tempted to free-ride on their fellow members' efforts and contribute less than they could have. The group-level effect (i.e., the temptation to free ride as a consequence of identifiability) may exist for all members, but the strength of the effect may depend on individual differences (e.g., on an individual's identification with the group). Thus, a thorough understanding of group creativity requires a multilevel perspective, recognizing that groups are more (or less) than the sum of their parts.

Building on this conceptualization, the remainder of this contribution will discuss two broad topics. First the evidence about creative performance in groups will be summarized, and then ways to make groups more creative will be discussed.

Creative Performance in Groups

Although creativity is not a linear process, many theorists and researchers adopt some sort of stage model of creativity, for example moving from problem definition to idea generation, via idea evaluation and selection, to idea implementation. In

the context of group creativity, research has primarily focused on idea generation, but research is increasingly beginning to study the later 'stages' of the creative process in groups.

Idea Generation

Many people will associate idea generation in groups with brainstorming sessions. The word brainstorming (using the brain to "storm" a problem) was coined by advertising executive Alex Osborn in his 1953 book *Applied imagination* (Osborn, 1953). He proposed that group idea generation would be stimulated when idea generation and idea evaluation are strictly separated: When judgment is deferred to a later moment, people do not fear evaluation and criticism and are more likely to share their wildest (and potentially most creative) ideas. Further, Osborn suggested that emphasis during idea generation should not be on idea quantity, because the more ideas that are generated, the more likely that some of them will be good. He converted these two principles, "deferment of judgment" and "quantity breeds quality," into four brainstorming rules: Quantity is wanted; freewheeling is welcomed; do not criticize ideas; and build on and combine previous ideas. Osborn also originally suggested that, when these four rules are followed, people would be more creative when they work in groups rather than alone, because group members may stimulate additional ideas from each other.

Brainstorming has since become one of the most used creative techniques. For example, the word "brainstorming" yields more than 75 million hits in a Google search (January 2019), of which almost 50,000 give advice on how to brainstorm more effectively (at least, they contain the phrase "effective brainstorming"). Moreover, the brainstorming technique has generated a considerable amount of research, allowing for a number of robust conclusions (see Stroebe et al., 2010, for an overview).

There is evidence that generating more ideas is associated with generating more good ideas, with "good ideas" defined as those that are both original and useful. However, sheer productivity (i.e., number of ideas, often also called idea fluency) usually is not related to the *average* quality of ideas. It is thus the case that generating more ideas implies generating more good ones, but also more bad ones (i.e., those relatively low on originality, usefulness or both). However, there is less clarity about the rule of not criticizing ideas. On the one hand, evidence suggests that a group climate in which ideas are shared openly without fear of criticism or ridicule –a psychologically safe team climate– is beneficial for creativity. On the other hand, some evidence suggests that (mild) conflict and dissent during idea generation can be beneficial as well. Conflict, however, only has these beneficial effects when it is constructive rather than personal and when the team climate is safe (see discussion below).

Most research has considered the question whether brainstorming in groups is more effective than brainstorming alone. When this question is asked to the general public, it appears that people across cultures (e.g., North America, Western Europe, Japan) share the belief that group brainstorming is more effective than individual brainstorming. However, when actually tested in research, this belief proved to be false: People actually generate more ideas and more good ideas when they brainstorm alone than when they brainstorm in groups. This is a robust finding and is usually referred to as the "productivity loss" of brainstorming groups.

Because this finding comes as a surprise to many, it is important to understand the methodology used in these studies. In particular, these studies compare the production of a (real, interacting) group of N people (say a five person group) with the production of so called "nominal groups" consisting of N people (e.g., five individuals) who work alone for the same amount of time ("equal person-hours comparisons"). After the brainstorming session, the production of these individuals is pooled, and duplicate ideas removed. The idea is that the performance of nominal groups should be a good estimate of group performance if interacting with others in a real, interacting group neither facilitates nor hinders individual idea generation. Research thus concluded that interacting in a group did not stimulate members' creativity, but rather inhibited it.

Research indicated that the effect may be partly due to lack of effort: People who work in groups may work less hard than individuals, who cannot "hide in the crowd." There is also some evidence that, despite the instruction not to criticize ideas, people are still somewhat reluctant to share all their ideas in a group (because of the fear of negative evaluation, often called "evaluation apprehension"), and that this is especially true for shy people. The most important cause, however, is *production blocking*. This refers to the fact that in groups usually only one person talks at the same time. This means that group members have to take turns to express their ideas and can only express them when no one is talking, which blocks their ability to produce ideas. Production blocking implies that group members often have to wait for their turn, and this has been shown to interfere with their ability to generate ideas.

Interestingly, if production blocking is an important cause of the productivity loss of brainstorming groups, this implies that the productivity loss should disappear if turn-taking is eliminated. This is exactly what was found when procedures were used that did not require turn-taking among group members, such as exchanging ideas through computers (electronic brainstorming; people can type simultaneously and read ideas of others on the screen) or through written notes (brainwriting; people pass on written notes to others but can write at the same time). In fact, there is evidence that sharing ideas is actually stimulating in electronic brainstorming and brainwriting groups, leading to ideas that people probably would not have generated.

Recent studies also looked at the degree to which group members followed the fourth brainstorming rule regarding combining and building on previous ideas (Kohn et al., 2011). Groups whose members actively followed the rule outperformed groups that didn't. Thus, cognitive stimulation in groups could happen either because hearing (or reading) somebody else's idea activates domain knowledge in long-term memory and hence leads to new ideas, or because group members actively try to build upon and extend the raw materials provided by other group members' ideas.

Another area of group work where cognitive stimulation (rather than productivity losses) is central, is *group improvisation* (e.g., in music or improvisational theatre; e.g., Sawyer, 2007). While a brainstorming session revolves around generating as many ideas as

possible, which is difficult to reconcile with group interaction (e.g., with the rule that only one person speaks at a particular time), other creative group tasks are more about collectively creating something by continually building upon each other's contributions. Thus, a jazz trio is (hopefully) not trying to produce as many new musical phrases as possible, but rather to use the group interaction to come to something new and valuable within a certain framework. However, probably due to difficulties in data collection and analysis in such naturalistic and spontaneous group interactions, most research on group creativity has focused on idea generation in brainstorming or similar tasks.

To summarize, the brainstorming literature suggests that brainstorming in the traditional way – sitting around a table and expressing ideas aloud – is not very effective. More successful methods include electronic brainstorming and brainwriting, exchanging ideas with others which can be stimulating. Stimulation may occur both as a consequence of exposure to others' ideas, or when people build on one another's ideas (e.g., during improvisation).

It should be noted that organizations may use group brainstorming sessions for other reasons than mere productivity (Sutton and Hargadon, 1996). For example, group brainstorming sessions are also thought to be useful to expose employees to a variety of ideas, possibly learning new things in the process, to stimulate transactive memory in the team or organization (i.e., 'knowing who knows what'), to act as a team-building intervention (e.g., because they can be a lot of fun to do and group members are able to contribute whatever they want), and to be a useful marketing tool towards (potential) clients. Thus, there may be other reasons to use brainstorming groups that are not necessarily invalidated by productivity losses.

Beyond Idea Generation

Although most research on group creativity has focused on idea generation, this is rarely the end of the creative process: additional steps include *recognizing* the most creative, valuable, or promising options, *refining* or *developing* ideas in order to satisfy different constraints, *selecting* ideas that actually deserve to be implemented, *promoting* ideas to stakeholders in order to gain the necessary resources, and of course *implementing* an idea into something that can actually be used or sold. All these activities can take place in a group setting; in fact, the closer one gets to implementation, the more likely coworkers, managers and possible clients are to get involved.

It has also been argued that these later stages of the creative process, such as idea evaluation and idea selection, are the ones where group work is more likely to be effective than individual work. Groups outperform individuals on so-called intellective tasks, where the search is not for ideas but for a demonstrably correct solution. In these *disjunctive group tasks*, only one member needs to find the correct answer for the whole group to succeed. Unless there is something about the group process that hinders members in searching for a solution (e.g., production blocking in idea generation) or sharing the solution with the group (e.g., evaluation apprehension, lack of safety), groups will generally outperform individuals on these tasks, simply because the probability of at least one of the group members finding the solution will be higher than the probability of a single member finding the solution. This may happen in so-called *insight problems*; there, the correct solution is usually recognized to be correct once it has been produced, and indeed groups do seem to outperform individuals on such tasks. However, creative problem solving is not an intellective, but a judgmental task; that is, there often is no clear 'correct' answer or solution. Consequently, the best idea is not automatically recognized when it is proposed.

Idea Selection

Research indicates that groups do not perform very well in selecting creative ideas (e.g., after a brainstorming session). Experiments on idea selection after group brainstorming consistently found that groups seriously underperform in terms of selecting their best or most creative ideas, sometimes even failing to perform above chance level: In several studies, the ideas that groups selected did not differ in quality from the average of their ideas. They seemed to prefer high feasibility over high originality. Thus, creative potential generated during brainstorming gets lost during idea selection. This is especially problematic in light of the fact that many interventions and techniques (such as brainstorming) seem to focus on getting groups to generate more ideas. Research on idea selection suggests that this can be a serious waste of time and money, since these ideas are likely to get lost in selection anyway.

Similar results have been found on the individual level, suggesting that this is not exclusively a group problem, but also reflects something about the way people respond to creative ideas. Because creative ideas are risky and unpredictable, they can cause uncertainty and can lead people to avoid them and to favor more familiar options that are known to be feasible. However, this may well be exacerbated by the group context: Considering that the selection of creative ideas is a judgmental task that typically is done through a 'majority wins' decision rule, and that biases present among individuals tend to become more influential under 'majority wins', the individual bias against originality may become even stronger in a group context. In contrast, as explained above, if idea selection were intellective (that is, a matter of finding a demonstrably 'best' option), group interaction should enhance performance (because the chance of at least one group member finding the best idea would be higher). The difficulty of selecting creative ideas, then, lies in the uncertain and unpredictable nature of highly original ideas, and this is also what makes it especially difficult for groups.

Idea Development

Raw ideas are rarely ready to be selected (or rejected) for implementation: Usually an idea will need to be refined, improved, elaborated, and/or adapted to the constraints of reality before selection and implementation can take place. Like idea generation, idea

development, or the process of refining and improving ideas, can be done by individuals, but is often likely to happen collaboratively. Idea development processes do seem to contribute to groups' idea generation and selection performance, suggesting that idea development is not necessarily an intermediate stage on the road towards selection, but can in itself lead to cognitive stimulation effects (or even to redefinition of the problem), and hence to new ideas (e.g., McMahon et al., 2016) (See Problem Finding).

An additional possibility is that idea development opens the door for better idea selection, because it allows one to improve an idea in order to have it satisfy multiple criteria (e.g., high originality *and* high feasibility). Thus, if an idea has appeal because of its high originality but seems unfeasible, rather than rejecting it out of hand, the idea could be refined or revised to make it more practical or easier to implement, while retaining the novel aspects of the idea. Although idea development discussions in groups have also been found to revolve strongly around feasibility (similarly to what happens in idea selection), groups should be especially suited for idea development if they bring their diverse cognitive resources to bear on the discussion (See Problem Solving).

Idea Implementation

The goal of idea generation, development, and selection is to turn ideas into actual products or procedures that can be sold or used – that is, idea implementation. Idea implementation is usually considered the end of the 'idea journey', where creativity turns into innovation. In reality, of course, even idea implementation can give rise to new ideas or further idea development: Whatever occurs or fails to occur as a consequence of idea implementation can be the starting point for a new creative process.

Problematically, idea implementation appears to be predicted by other variables than idea generation. For example, whereas external pressures decrease group (or team) creativity, they may contribute to successful implementation. Thus, what helps (or hinders) groups in their idea generation is not necessarily what helps (or hinders) them in implementing their ideas. Since the focus of (group) creativity research has largely been on idea generation, relatively little is known about the factors that predict successful implementation, but effective decision-making (i.e., idea selection) is an inevitable precondition. Because of the problematic nature of idea selection, the transition from creativity to innovation (that is, from idea generation to idea implementation) appears to be particularly challenging. Research on group and team innovation has predominantly aggregated innovative performance in measures that confound idea generation and idea implementation, but to the extent that these factors have been separated, group, team, or other social processes seem to be essential facilitators in moving towards successful implementation (Somech and Drach-Zahavy, 2013).

On the whole, then, although groups have undeniable creative potential, they often fail to live up to it. To a large extent, this seems to be due to their failure to make use of their cognitive resources. Ideas, perspectives, and opinions often do not get shared and processed effectively and efficiently. As such, the group creativity literature aligns well with the broader literature on group performance and group decision-making. For example, during decision-making tasks groups often discuss only knowledge that is already available to all group members, even if discussing unshared or unique information would demonstrably lead to a better decision. The discussion of task-relevant information, furthermore, can be superficial, and groups often fail to find optimal outcomes (such as integrative solutions in negotiations) even if all relevant information is available to all group members. Groups also often focus on reaching (and maintaining) consensus rather than on making the best possible decision, and often reject divergent information or viewpoints that threaten this consensus (especially when working under time pressure). Moreover, group polarization can lead to groups adopting an unnecessarily extreme viewpoint, which is not warranted by the opinions or knowledge of the individual members.

Nevertheless, despite the plethora of pitfalls that groups can fall into, the enduring popularity of group- and teamwork suggests that group creativity, for better or worse, is here to stay. The following section will discuss some general issues of how to organize creative group work effectively.

Designing Groups for Creativity

The literature on groups and teams is sometimes organized according to an Input-Process-Output framework, where Outputs are those variables that describe group or team performance – in this case, creativity. Input variables are those variables that describe what is 'given' about the group, such as group composition, group size, and characteristics of the group task. Process variables describe the things that go on in the group, such as communication, conflict and cohesion, and group climate and norms. Below, we discuss several Input and Process variables that affect group creativity.

Group Composition and Diversity

Obviously, group creativity benefits from having members with sufficient creativity-conducive traits and abilities. Personality, domain knowledge, creative skills, and motivation all contribute to each member's creative performance and hence might be expected to contribute to that of the group. This seems to be true to a large extent, although research also suggests that there is value in having (some) less creative group members (for example because these may be better equipped to safeguard a cooperative and systematic group process). Moreover, larger groups are not always more creative than smaller ones, even though a larger group should, all other things being equal, have a higher probability of containing at least some members with highly valuable knowledge, traits, or skills. For example, larger groups seem to be more susceptible to social loafing (where group members contribute less to the

group than they could, because their individual contributions are not identifiable and are perceived to be dispensable). Then again, larger groups potentially harbor a greater *variety* of knowledge, traits, and skills. Thus, beside the mere presence of certain member characteristics in the group, the way they are distributed and arranged in the group is a crucial aspect of group functioning as well.

However, group diversity actually is a double-edged sword: On the one hand, it is one of the reasons for using groups to begin with, but on the other hand groups often find it difficult to deal with. As a consequence, the effects of diversity on group creativity are inconsistent. Surface-level or demographic diversity (e.g., gender, ethnic, or age diversity) in particular can easily give rise to subgroup formation and, as a consequence, ineffective communication and information sharing within groups. Deep-level or cognitive diversity (which may or may not be aligned with surface-level diversity), on the other hand, is where groups' creative potential originates, but when left to their own devices groups usually fail to make use of this resource. Given that creativity, including creative decision-making, requires the integration and combination of diverse information, this obviously hampers groups' creative performance.

Whether or not groups are able to make use of their diversity depends on several factors, such as the diversity beliefs that group members hold: If group members have a strong belief that diversity is a valuable resource (rather than, say, a threat or a complication), diverse groups may perform more creatively than homogeneous groups, because they will be more willing to exchange and process diverse information and perspectives. Generally speaking, (cognitive) diversity *can* stimulate group creativity, if the group members are able and motivated to exchange and process their diverse (task-relevant) knowledge and ideas. However, field research also suggests that team diversity, although it can indeed stimulate creativity, does not automatically lead to successful implementation of the generated ideas.

Of course, group composition is not necessarily a given. Groups and teams change over time. This may also affect group creativity: For example, *newcomers* can bring previously unavailable knowledge or perspectives to the group. Some work suggests that such membership changes can indeed bring about or stimulate group creativity, but this depends on several boundary conditions including the characteristics of the newcomer, the stability of group membership, and group climate. Similarly to other forms of minority influence, a newcomer's ideas are not automatically attended to or valued by the rest of the team, but there is the potential for a newcomer to make a novel contribution that would not have been made otherwise.

Task Design and Interdependence

Besides selecting the right people for the group, for example those high in creativity or those contributing relevant and unique skills and insights, a fundamental way to enhance group creativity is through task design. A first, and relatively obvious principle is that the member resources (that follow from group composition) must be sufficient to match task requirements. If this is not the case, and important skills and knowledge are missing, it follows that either group composition must be changed or the task must be adjusted.

Secondly, at the individual level, the job characteristics model suggests that optimal task design includes 1) providing employees with sufficient autonomy, so they feel responsible for their job; 2) providing them with constructive feedback, so they know how well they are doing; and 3) giving them tasks that require varied skills, that are important to them, and that require the completion of a whole task (rather than only a part of it), so employees experience their work as meaningful. It is likely that these conditions will not only enhance work motivation and effectiveness of individual employees, but also of groups. For example, many organizations grant much autonomy to their teams, and research confirms that creativity and innovation are more likely to thrive in such relatively flat (as compared to more hierarchically structured) companies.

Thirdly, when it comes to team design, another critical task design feature is interdependence. Research distinguishes two types of interdependence. *Task interdependence* refers to the degree to which work is designed in such a way that members depend on each other for access to resources (e.g., information) and for coordinated action. *Outcome interdependence* refers to the degree to which outcomes of tasks are measured, rewarded and communicated at the group (rather than the individual) level. Research suggests that task interdependence creates a *need* for group members to cooperate, whereas outcome interdependence creates the *motivation* to do so. Because cooperation is crucial for groups to achieve high creativity, these two types of interdependence are extremely important.

Importantly, task and outcome interdependence are not necessarily aligned. It is possible, and relatively common, that group members have high task interdependence, but that feedback and rewards (e.g., promotion opportunities) are given to individuals and not the team. This is potentially problematic, because it creates a situation in which people have to collaborate, but may lack sufficient motivation to do so. Similarly, a combination of high outcome and low task interdependence creates problems, because people may have the motivation to work together but lack control over outcomes. Good task design thus requires that both types of interdependence are aligned. Following the principle that high group creativity requires an optimal combination of contributions of individual members, the alignment of high task and high outcome interdependence will stimulate cooperation and make it more likely that resources of the team members are used in an optimal way.

Group/Team Climate

Although properties of the group (e.g., composition) and the group task (e.g., interdependence) are important, some of the strongest influences on group creativity are found in the group process. These group or team processes, especially in organizations, are often described as *climate*, which is a shared set of norms and expectations regarding the way a team works. Climate factors are among the strongest predictors of group/team innovation, and the transition from idea generation to idea implementation crucially

depends on climate. Much of this work has used the Team Climate for Innovation model, which identifies four climate dimensions that contribute to group or team creativity and innovation (Anderson and West, 1996). Groups and teams perform more creatively and innovatively if they work towards a shared and valued goal, if new input and divergent opinions are welcomed, if innovative performance is the goal and the norm, and if the group is striving for excellent (innovative) performance.

Of these process or climate variables, *safety* –the degree to which members feel that their input is welcome– is particularly interesting, because its role is paradoxical. On the one hand, a safe group climate means that members can contribute without fear of negative evaluations or ridicule. A lack of self-censorship is a crucial precondition for creativity (and was one of the reasons Alex Osborn devised his classic brainstorming method). Thus, a certain sense of safety, group cohesion, or cooperation (as opposed to intragroup competition) is important. On the other hand, if safety and cohesion become dominant concerns, this could lead to group members holding back ideas or opinions that might cause conflict or dissent (in extreme cases, this could lead to forms of groupthink). This is particularly important in the context of group creativity, because novel ideas require a jump into the unknown and therefore are associated with uncertainty. In fact, organizational research suggests that employees who contribute and push for implementation of creative ideas are likely to experience more conflict with colleagues, because these creative ideas challenge the status quo.

A curvilinear relation between safety, creativity and innovation has been hypothesized, suggesting some optimal level of safety that is neither too low nor too high (Hülsheger et al., 2009). Research suggested that groups perform most creatively when there is a mix of individualism (stimulating group members to develop their own, unique perspectives and ideas) and collectivism (motivating group members to contribute these perspectives and ideas for the benefit of the group). This tension between individualistic and collectivistic tendencies was addressed in a study which showed that minority influence (e.g., one group member disagreeing with the rest) can force the group to think about and discuss the task or task-relevant information more deeply (although this may require a high degree of participative decision-making), and may enhance divergent thought within the group. Moderate levels of task conflict may also contribute to group creativity or innovation, again because these can stimulate groups to engage in deeper information processing and more divergent thought – as long as the task conflict does not escalate and spill over into relationship conflict. Thus, creativity seems to require a group climate that is safe and cooperative enough for the individual member to challenge group members views and risk some conflict once in a while.

Other research that looked at different climate variables suggests that organizational teams perform more creatively when they have a strong promotion climate (i.e., focused on growth, attaining successes, and realizing ambitions) as opposed to a prevention climate (focused on safety, avoiding mistakes, and fulfilling responsibilities). Other group process variables that can affect creativity include reflexivity (the degree to which the group reflects on its own goals and strategies), communication both within and outside of the group or team, and conformity pressure resulting from a high need for closure (e.g., as a consequence of time pressure). If the group is strongly focused on making a quick decision, new information or divergent opinions are not welcome and will probably not get processed deeply.

Leadership

Finally, a great deal of research has considered leadership as an important determinant of group creativity. Even though organizations sometimes use leaderless teams (e.g., self-managed teams), most still include some form of leadership. Because leadership implies that those holding a leadership position have more power and influence than those who do not, characteristics and actions of leaders will have a disproportionate effect on creativity of the team.

There are two broad approaches to how leadership affects creativity in groups. The first looks at leadership styles. Most attention has been given to transformational leadership, which refers to a leadership style consisting of a combination of having an appealing vision for the group (e.g., be charismatic) and intellectual stimulation and taking care of group members. Not surprisingly, this leadership style will generally benefit group creativity, because it solicits the input of group members and unites them to try to achieve something great together. For example, it has been found that teams with transformational leaders are better able to reap the benefits of team conflict. A downside of this type of leadership is that it makes group members fairly dependent on the leader.

The second approach proposes that the task of leaders is to create the conditions for groups to be creative. In line with the discussion of designing creative groups, this approach suggests that leaders have to 1) make sure that they have the right people in the group; 2) create the right task conditions (e.g., interdependence structure); 3) create the right group climate (e.g., one in which members feel safe to express their unique insights). Other functions that leaders need to fulfill are ensuring that the group has sufficient resources, and monitoring progress and providing feedback to the group. This approach suggests that groups can be made more creative if leaders create the conditions under which group members can "do their thing" in an optimal way.

Conclusion

Groups have undeniable creative potential: The presence of a large and diverse store of knowledge, experiences, personalities and opinions can, in principle, make them extremely powerful sources of creativity. Whether or not groups live up to this potential crucially depends on the way they organize their work. When left to their own devices, it is all too easy for groups to fall into one of the myriad pitfalls associated with group work. However, under the right circumstances, including high levels

of task-relevant cognitive diversity coupled with effective leadership, favorable diversity beliefs and membership, moderate levels of task conflict, a strong motivation to process task-relevant information and a healthy mix of individualistic and collectivistic motives, groups have a lot to offer.

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