European Journal of Social Psychology
Eur. J. Soc. Psychol. **34**, 365–374 (2004)
Published online in Wiley InterScience (www.interscience.wiley.com). **DOI**: 10.1002/ejsp.210

The liberating role of conflict in group creativity: A study in two countries

CHARLAN J. NEMETH[1]*,
BERNARD PERSONNAZ[2], MARIE PERSONNAZ[3]
AND JACK A. GONCALO[1]
[1]*University of California, Berkeley, USA*
[2]*University of Rouen, CNRS and EHESS, Paris, France*
[3]*University of Paris X-Nanterre and EHESS, Paris, France*

Abstract

Researchers of group creativity have noted problems such as social loafing, production blocking, and especially, evaluation apprehension. Thus, brainstorming techniques have specifically admonished people 'not to criticize' their own and others' ideas, a tenet that has gone unexamined. In contrast, there is research showing that dissent, debate and competing views have positive value, stimulating divergent and creative thought. Perhaps more importantly, we suggest that the permission *to criticize and debate may encourage an atmosphere conducive to idea generation. In this experimental study, traditional brainstorming instructions, including the advice of not criticizing, were compared with instructions encouraging people to debate—even criticize. A third condition served as a control. This study was conducted both in the United States and in France. Results show the value of both types of instruction, but, in general, debate instructions were superior to traditional brainstorming instructions. Further, these findings hold across both cultures. Results are discussed in terms of the potential positive value of encouraging debate and controversy for idea generation. Copyright © 2004 John Wiley & Sons, Ltd.*

Most research on group creativity has concentrated on the individual rather than the group, generally focusing on the problems and sub-optimality of groups (McGrath, 1984). Most research also tends to emphasize harmony and the elimination of evaluation apprehension for creative idea generation (Diehl & Stroebe, 1987; Paulus & Dzindolet, 1993). Thus, techniques such as brainstorming include a specific instruction 'not to criticize' (Osborn, 1957). In contrast, there is considerable research documenting the value of conflict and confrontation of differing viewpoints (De Dreu, Harinck, &

*Correspondence to: Professor Charlan Nemeth, Department of Psychology, University of California, Berkeley, Berkeley, CA 94720-1650, USA. E-mail: charlan@socrates.Berkeley.edu

Contract/grant sponsor: Institute for Industrial Relations; contract/grant sponsor: Committee on Research, University of California, Berkeley.

Received 6 October 2003
Accepted 16 January 2004

Van Vianen, 1999; Nemeth, 1995; Pérez & Mugny, 1993; Personnaz & Personnaz, 1994). In this paper, we propose changing the time-honoured brainstorming instructions and, rather than admonish people not to criticize, we propose that the encouragement of debate—even criticism—may permit the generation of more creative ideas. Further, to test the replicability of the findings, we have conducted this study in both the United States (US) and in France.

THEORY AND HYPOTHESES

Techniques for Enhancing Group Creativity

Most of the research literature on creativity focuses on the individual, especially on personality characteristics and thought processes that distinguish high vs. low creative individuals or on social factors that aid or hinder individual creativity (Amabile, 1983; Nemeth & Nemeth, 2001). There is notably little research on *group* creativity (Kasof, 1995; Paulus, Brown, & Ortega, 1999) despite the fact that organizations heavily depend on teams or groups to generate solutions to problems (West & Farr, 1990). The research that does exist focuses on the sub-optimality of performance by groups relative to individuals working alone (Sternberg, 1995). Compared to individuals working alone, groups generate substantially fewer solutions (McGrath, 1984) and the reasons include ways in which interaction hinders creativity (Paulus, Larey, & Dzindolet, 2000). They include evaluation apprehension, social loafing (Karau & Williams, 1993) and conformity (Larey & Paulus, 1999). Thus, some attempts to raise group creativity have focused on the reduction of some of the 'problems' with groups.

One such technique, brainstorming, has been widely used for over 50 years, especially in work organizations (Osborn, 1957). It is in fact the mantra for companies such as IDEO, arguably the best design firm in the world (Hargadon & Sutton, 1997). The claim is that brainstorming instructions improve group creativity because they address issues of evaluation apprehension and social loafing. To lower such apprehension and loafing, individuals are specifically encouraged to emphasize quantity of ideas and more importantly, they are specifically instructed *not* to criticize their own or others' ideas. Rather, they are encouraged to freewheel as well as to build upon and elaborate others' ideas.

Given the emphasis on harmony, most researchers have assumed that conflict, especially anything resembling criticism, reduces group creativity. Thus, there has been considerable emphasis on the elimination of such criticism and the concerns about evaluation that accompany it. As such, the specific instruction not to criticize one's own or others' ideas is *central* to the brainstorming technique.

The actual research on brainstorming, however, is mixed as to whether or not brainstorming instructions increase group creativity (Dunnette, Campbell, & Jaastad, 1963). In general, brainstorming instructions do enhance idea generation relative to no instructions (Parnes & Meadow, 1959). What the research literature does show consistently is that groups, even under brainstorming instructions, rarely perform as well as the individuals. If both individuals and groups are given brainstorming instructions, 'individuals working separately generate many more, and more creative (as rated by judges) ideas than do groups, even when the redundancies among member ideas are deleted' (McGrath, 1984, p. 131).

One of the problems with an instruction to refrain from criticism is that individuals may still worry about negative evaluations—albeit silent criticisms. Camacho and Paulus (1995) lend some credence to this notion by finding that groups composed of 'high-interaction anxious' individuals showed poorer performance in a traditional brainstorming session than did groups composed of 'low-interaction anxious' individuals. Importantly, this is a group phenomenon. Individuals who are highly anxious in interactions show poor performance in groups but this individual difference measure did not

differentiate performance at the individual level. Diehl and Stroebe (1987) argue that, even under brainstorming instructions, problems of production blocking and evaluation apprehension remain.

Emphasizing the Value of Dissent and Conflict

While brainstorming instructions focus on the elimination of criticism, it is of interest that proponents of another technique, the Nominal Group Technique (NGT), make quite a different argument (Delbecq, Van de Ven, & Gustafson, 1974). The NGT has individuals work separately in the first stage (idea generation) and then interact as a group in the second stage (evaluation and implementation). The presumption is that groups are poor at idea generation because they get involved in social relations and tend to *avoid* conflicts between members' ideas, or smooth them over, and spend most of their time discussing non-controversial issues (see McGrath, 1984). The implication is that confrontation of competing views is to be desired.

Other research also posits the potential value of conflict, especially conflict that is related to the task rather than the person (Jehn & Mannix, 2001). Work by Postmes, Spears, and Cihangir (2001), for example, compared 'critical' norms—those that valued unshared (novel) information—and consensus norms which placed more value on shared information. The former produced better decisions.

The notion that groups perform better when they share and even confront differences bears some resemblance to the research on the value of dissent and diversity. Diversity is often found to aid the quality of decisions, presumably because of the multiple perspectives that it provides (Milliken & Martins, 1996; Williams & O'Reilly, 1998). The effectiveness of minority dissent is presumed to rely on the cognitive conflict that it engenders and there is now considerable evidence that it stimulates divergent thinking and enhances the quality of thought and decisions of the group. For example, people exposed to minority dissent search for information on all sides of the issue; utilize all strategies in the service of performance; and detect solutions that otherwise would have gone undetected (see generally Nemeth, 1995, 2003). Such thought processes have been found to result in better judgments and better decisions (Martin & Noyes, 1996; Nemeth & Staw, 1989). Further, in more naturalistic settings, there is evidence that groups with a dissenter make better decisions (Van Dyne & Saavedra, 1996). Organizations fare better when dissent is valued and expressed (De Dreu et al., 1999; Nemeth, 1997).

Harmony vs. Conflict for Idea Generation

As we have seen, the role of conflict in idea generation has competing viewpoints. Many researchers emphasize the necessity of reducing conflict especially a reduction in evaluation or criticism (Osborn, 1957; Paulus et al., 1999; Paulus & Dzindolet, 1993). Other researchers emphasize the value of conflict in that it stimulates thought and creative solutions (Moscovici, 1980; Nemeth & Nemeth-Brown, 2003). The latter appears to occur especially when these differing viewpoints are authentically held (Nemeth, Brown, & Rogers, 2001). Thus, a normative environment that permits—even encourages—debate, dissent and criticism may liberate people to freely generate ideas. This, we suggest, may be superior to an emphasis on harmony, which is often at the expense of authentic differences. The efficacy of such an instructional focus on debate would be in direct contrast to the mainstream literature that emphasizes harmony and cohesion—and, especially, the avoidance of criticism.

What we hypothesize is that the freedom or permission to critique, even criticize, can create an atmosphere of freedom and enhance the generation of creative ideas. It could do this at two levels. One is at the level of permitting discourse that would otherwise be monitored. A second is at the level of stimulating additional thought via the expression of competing views. If what brainstorming attempts

to achieve is quantity of ideas without regard for their quality (Osborn, 1957), the freedom to express thoughts without worrying whether they constitute a criticism of another's ideas may be well suited to idea generation. Given that criticism is often seen as undesirable and even impolite—and normal brainstorming instructions emphasize precisely that—we hypothesize that framing criticism in terms of its potential for group creativity would both liberate individuals to be relatively free of evaluation apprehension and stimulate them to express ideas more freely. Further, such an atmosphere might also stimulate creativity subsequent to the interaction.

The latter point deserves attention. Research on the brainstorming technique has emphasized the fact that groups may be sub-optimal to individuals working ideas alone because of 'production blocking' (Diehl & Stroebe, 1987). People can't talk at the same time and, as such, some ideas may not be expressed. We suggest that these ideas can and should be captured and, moreover, there may be ideas stimulated by the discussion that occur subsequent to the interaction. Such a hypothesis is consistent with research showing that ideas presented in the group can prime subsequent ideas (Dugosh, Paulus, Roland, & Yang, 2000). It is also consistent with the literature on minority influence that repeatedly finds attitude change or creative solutions *after* discussion (Mugny, 1982; Nemeth et al., 2001).

In the present study, we propose testing the potential value of permitting criticism and dissent (Debate condition) rather than one emphasizing harmony and a lack of criticism (traditional Brainstorming condition). Given that brainstorming instructions are very clear and admonish group members *not* to criticize each others' ideas, we will substitute that instruction with one encouraging debate and criticism. A Control (termed Minimal) condition will offer no instructions other than the task description.

Most researchers would predict that our substitution of advice 'not to criticize' for its opposite—to debate and even criticize—would be detrimental. Most would predict that subjects in that condition would generate fewer ideas than the Minimal condition and certainly fewer ideas than the traditional Brainstorming condition. Our prediction is that there will be *more* ideas generated in the Debate condition than the Minimal condition. Further, we predict that the Debate condition will have as many ideas as the traditional Brainstorming condition. It is an empirical question whether it is even superior to traditional instructions. Finally, we test these hypotheses in two different cultures: the US and France. Our primary interest in collecting data in two countries is the generalizability of the findings. While replicability, even in the same laboratory, is of value, we suggest that the findings will be more robust if they do not vary by geographical location and prove to be similar in two different countries. Our specific hypotheses are:

Hypothesis 1: Subjects in the Debate condition will generate as many, if not more, ideas than those in the traditional Brainstorming condition. Both conditions will generate more ideas in the groups than those given Minimal instructions.

Hypothesis 2: Subjects in the Debate condition will generate as many, if not more total ideas (group plus post discussion) than those in the traditional Brainstorming condition. Both conditions will generate more total ideas than those given Minimal instructions.

METHOD

Participants and Procedure

In the US sample, subjects were 265 females who volunteered for participation through the subject pool at the Department of Psychology, University of California, Berkeley. Subjects were run in groups of five same-sex individuals. One group was removed due to a failure to understand the instructions, resulting in 260 subjects comprising 52 groups of five persons.

In the French sample, subjects were 30 male and 175 female undergraduates who volunteered for participation through psychology classes at University of Paris 10, Nanterre. Subjects were run in groups of five same-sex individuals. Two all-female groups were removed for not following instructions, resulting in 195 subjects comprising 39 groups of five persons. The procedure was identical in both countries.

Upon entry, subjects were seated at a table and asked not to speak until the study began. All groups were told that we are interested in the topic of how to reduce traffic congestion in the San Francisco/Bay Area (Paris). They were given 20 min to come up with as many good solutions as they could to the problem.

In each session, one subject was randomly assigned to be the recorder for the group. Instead of participating in the discussion, the recorder was instructed to write down every single idea the group generated. The brainstorming topic was repeated and they were reminded that they had 20 min to complete the task.

In all conditions, they were told to 'come up with as many good solutions as you can to the problem.' ('Nous voulons que vous donniez autant de bonnes solutions que vous pouvez.)'

In the *Minimal* condition, the groups were not given any additional instructions.

In the *Brainstorming* condition, they were given the traditional elements of brainstorming (Diehl & Stroebe, 1987) including the advice not to criticize. They were told: 'Most research and advice suggest that the best way to come up with good solutions is to come up with many solutions. Freewheeling is welcome; don't be afraid to say anything that comes to mind. *However, in addition, most studies suggest that you should rule out criticism. You should NOT criticize anyone else's ideas*.' ('De nombreuses recherches et points de vue suggèrent que le meilleur moyen de parvenir à de bonnes solutions c'est de proposer beaucoup de solutions. L'imagination est la bienvenue; n'hésitez donc pas à dire tout ce qui vous vient à l'esprit. Cependant, pour résumer, (en appuyant) un nombre important d'informations en ce domaine indiquent qu'il est souhaitable d'éviter toute critique. Vous ne devez donc pas critiquer les idées des autres.')

In the *Debate* condition, the instructions were the same as in brainstorming except for the advice not to criticize. Rather, the participants were specifically advised to engage in debate and even criticism. They were told: 'Most research and advice suggest that the best way to come up with good solutions is to come up with many solutions. Freewheeling is welcome; don't be afraid to say anything that comes to mind. However, in addition, most studies suggest that you *should* debate and even criticize each other's ideas.' ('De nombreuses recherches et points de vue suggèrent que le meilleur moyen de parvenir à de bonnes solutions c'est de proposer beaucoup de solutions. L'imagination est la bienvenue; n'hésitez donc pas à dire tout ce qui vous vient à l'esprit. Cependant, pour résumer, (avec insistance) de nombreuses informations en ce domaine indiquent qu'il est souhaitable d'entrer dans un débat et même de critiquer les idées des autres.')

After 20 min elapsed, the experimenter returned to the room and collected the group solution sheet. Each person then individually completed two items. For the first, they were asked to write down any solutions that they thought of during the group discussion but did not express. For the second, they were asked to write down any solutions they might have NOW after the group discussion is over.

Following the completion of the survey, they were permitted to ask questions and were then debriefed and dismissed.

RESULTS

We started with the specific hypothesis that, contrary to most theorizing, the Debate condition would be as good as, if not better, than the traditional Brainstorming condition for idea generation. Due to a powerful historical event, we excluded data from the US sample that was collected during the week

Table 1. Mean number of ideas generated by groups by condition and country

Group	Minimal	Brainstorming	Debate
US	18.8	20.0	24.0
FR	15.6	18.3	21.0
Combined	16.2_a	18.7	21.7_b

Differing subscripts indicate that the means are significantly different at $p < 0.05$.

following 9/11—September 11, 2001 when terrorists claimed the lives of more than 3000 people.[1] This was an especially difficult time in the US when issues of conflict and debate would be complex. Thus, we analysed the data without those subjects and provide separate information on these individuals.[2] All analyses are calculated with the group as the unit of analysis.

The data, both US and French, were analysed by a 3×2 analysis of variance (ANOVA) (3 conditions $\times$ country US/FR). For the number of ideas generated in a group, there was a marginally significant effect for condition $F(2, 49) = 2.4$, $p < 0.10$, no significant difference for country $F(1, 49) = 1.8$, NS and no significant interaction $F(2, 49) \leq 1$, NS. Specific contrasts revealed that the Debate condition generated significantly more ideas than did the Minimal condition $F(1, 34) = 6.2$, $p < 0.05$. The Brainstorming condition did not differ significantly from the Minimal condition $F(1, 35) = 1.5$, NS. The Debate condition had a non significant trend towards more ideas than the Brainstorming condition ($F(1, 35) = 2.6$, $p < 0.11$) (see Table 1).

For ideas post discussion, the findings were very similar for ideas 'not expressed' in the group and new ideas considered 'now.' Analyses of each of these dependent variables revealed no significant differences between conditions or country. However, there was a marginal interaction between country and condition for ideas not expressed $F(2, 49) = 2.5$, $p < 0.09$ and a significant interaction for ideas considered now $F(2, 49) = 3.8$, $p < 0.03$. A similar pattern of interaction occurs when these two variables are combined (post discussion ideas). There were no significant differences for condition $F(2, 49) = 1.75$, NS or country $F(1, 49) < 1$, NS but there was a significant interaction between country and condition $F(2, 49) = 4.3$, $p < 0.02$. The interaction is primarily due to the fact that, while the US and French subjects generate similar numbers of ideas in the Minimal and Brainstorming conditions, they differ when given permission to debate. In that condition, the US subjects generated significantly more ideas than did the French subjects $F(1, 16) = 5.3$, $p < 0.03$ (see Table 2).

Total production paralleled the group findings but the interaction effect was more statistically significant. In considering all ideas generated, whether in the group or post discussion, the 3×2 ANOVA showed a significant effect for condition $F(2, 49) = 4.1$, $p < 0.02$; there was no significant effect for country or an interaction of condition by country. Post comparisons showed that Debate was superior to Minimal ($p < 0.01$); Brainstorming was not significantly different from Minimal ($p < 0.40$) and Debate was superior to Brainstorming ($p < 0.05$). We also calculated 2×2 ANOVAs (condition by country) for each predicted contrast. For Minimal vs. Brainstorming by country, there

[1]9/11 is the phrase identifying September 11, 2001 when terrorists intentionally crashed four planes on US soil—one into the Pentagon in Washington DC, one on the ground in Pennsylvania (presumably headed for Washington DC) and two which were flown into the World Trade Center towers in New York City, killing nearly 3000 people. Memorial services were held the following week.

[2]Considering only the US subjects studied in the aftermath of 9/11, the Debate condition generated significantly more group ideas than did the Minimal condition ($F(1, 25) = 4.5$, $p < 0.05$) while the Brainstorming condition was only marginally superior to the Minimal condition ($F(1, 26) = 3.3$, $p < 0.08$). Both Debate and Brainstorming conditions produced more total ideas (group and post discussion) than did the Minimal condition ($F(1, 25) = 7.2$; $p < 0.01$; $F(1, 24) = 5.7$, $p < 0.02$, respectively) and did not differ from one another ($F(1, 23) \leq 1.0$, NS). Thus the differences between the Debate and Brainstorming conditions are smaller for this subject population than either the US or French subject population tested months earlier.

Table 2. Post discussion ideas: Those 'not expressed' and those considered 'now'

Group	Minimal	Brainstorming	Debate
Not expressed			
US	2.0	3.0	5.3
FR	3.9	2.1	2.6
Combined	3.4	2.4	3.2
Now			
US	1.5	3.6	7.0
FR	3.5	3.3	2.6
Combined	3.1	3.4	3.6
Post discussion (Not expressed + now)			
US	3.5	6.6	12.3
FR	7.4	5.5	5.1
Combined	6.5	5.8	6.7

Table 3. Total production: Mean number of ideas generated in group and post discussion

Group	Minimal	Brainstorming	Debate
US	22.3	26.6	36.3
FR	22.9	23.8	26.1
Combined	22.7_a	24.5_a	28.4_b

Differing subscripts indicate that the means are significantly different at $p < 0.05$.

was no main effect for condition, country or interaction $F(1, 33) < 1$, NS (for all effects). For Minimal vs. Debate by country, there was a main effect for condition ($F(1, 33) = 4.1$, $p < 0.05$) but no main effect for country or interaction $F(1, 32) < 1.3$, NS for both effects. For the comparison between the Debate and Brainstorming conditions, the 2×2 ANOVA (condition by country) revealed a significant main effect for condition ($F(1, 33) = 4.5$, $p < 0.04$), a significant effect for country ($F(1, 33) = 5.2$, $p < 0.03$) but no significant interaction $F(1, 33) = 1.6$, NS. Subjects in the Debate condition (X = 28.4) generated more ideas than did those in the Brainstorming condition (X = 24.5); US subjects (X = 29.2) generated more ideas than did French subjects (X = 24.3) (see Table 3).

DISCUSSION

Given that replications, even in the same laboratory, are often difficult to achieve, the similarity of findings in two quite distinct cultures argues for the strength of the results. Considering the data from both countries, there is evidence that groups encouraged to debate—even criticize (Debate condition) did not retard idea generation, as many would have predicted. In fact, such permission to criticize led to significantly more (rather than less) ideas than did the Minimal condition, both in the group and in total production of ideas.

Relative to traditional Brainstorming instructions, such permission to debate and criticize was at least as effective and, in fact, there is some indication of its superiority. First, traditional Brainstorming instructions did not produce significantly more ideas than the Minimal condition in either the group or in total production while the Debate condition was significantly better than the Minimal condition for

both dependent measures. Secondly, there is some evidence for even the superiority of the Debate condition over the Brainstorming condition. For ideas generated in the group, there was a non significant trend favouring Debate over Brainstorming and even stronger evidence for total production where Debate had significantly more total ideas than did Brainstorming.

There is also some interesting evidence from the post discussion results. First, subjects did report ideas they considered but did not express in the group. This is consistent with Diehl and Stroebe's (1987) contention that many ideas are lost in brainstorming sessions due to production blocking. Subjects also reported having new ideas now after discussion, presumably stimulated by the brainstorming session itself. Thus, there is evidence that more ideas are generated than those evident at the public level of discussion. Of interest is that these post discussion ideas appear to be stimulated most by the Debate instructions, at least for the US sample. Post discussion ideas were not differentially stimulated by the condition differences for the French sample.

The main findings of interest, as indicated above, are the superiority of Debate over Minimal instructions and its comparability, if not superiority, to traditional Brainstorming instructions. This is both interesting and surprising in light of the fact that the instruction 'Do not criticize' is often cited as *the* important instruction in brainstorming. The aim of not criticizing is to reduce or eliminate evaluation apprehension, often viewed as a major impediment to idea generation. Thus, even if the instruction is not completely successful in its attempt to eliminate criticism, most researchers of group creativity would argue that the premise is still correct. One should refrain from criticism. From this perspective, Debate instructions should be detrimental to idea generation, resulting in fewer ideas than those in the Minimal condition. The results are the opposite. Our findings show that it does not inhibit ideas but, rather, stimulates them relative to no such advice.

Perhaps even more surprising is the evidence suggesting that Debate is even more conducive to idea generation than traditional Brainstorming instructions. Such findings make us question one of the basic premises of the brainstorming technique, namely that an admonition 'not to criticize' is both an appropriate and an effective goal, one which frees ideas. While this assumption has not received empirical support, it has remained unexamined. The present study calls that assumption into question in that the encouragement *to* debate and even criticize, not only does not inhibit idea generation, it appears to enhance it even more than the traditional Brainstorming instructions.

The current study, especially in light of the fact that two distinct cultures are showing the same pattern of findings, raises the question as to whether the emphasis on politeness and non-evaluation may be counter-productive. Perhaps, freedom—even freedom to debate and criticize—is better suited to the generation of creative solutions. The question remains: Why is Debate—an actual encouragement of criticism—even more effective in stimulating idea generation in groups and in total production?

One might entertain several possibilities. One is that Debate—the encouragement of debate and criticism—actually lowers concerns about evaluation. By framing criticism as a contribution to the group, concerns about evaluation may be reduced in that criticism is deemed task related rather than personal. A second related possibility is that an instruction to do something that is normally forbidden—at least considered impolite—may be liberating in and of itself. Breaking rules, doing the 'forbidden,' stating one's mind directly may be very liberating and even stimulating.

An alternative explanation might suggest itself. One might argue that both Brainstorming and Debate instructions are more specific than are the Minimal instructions and, as such, encourage idea generation by virtue of their specificity. The goal setting literature (Locke & Latham, 1990, 2002), for example, finds that clear and precise goals are more effective than a generalized instruction of 'do your best.' However, specific goals or guidance can hinder as well as aid performance, depending on the value and accuracy of the advice (Nemeth, Mosier, & Chiles, 1992). One can give very specific—and bad—advice. Here, it is precisely the content of the advice that is relevant: 'do not criticize' or

'debate—even criticize.' The question is which type of advice, which type of culture provides an atmosphere conducive to idea generation?

The ways in which debate and conflict can be harnessed to foster creativity are not well understood. There is evidence that it is best served by dissent that is authentically held rather than role played (Nemeth et al., 2001). An implication of this is that, where differences exist, they should be expressed, confronted and explored.

While this study offers considerable support for the value of instructions permitting and encouraging debate, there may well be contextual factors that enhance or diminish such effects. The results from the subjects studied in the aftermath of 9/11 (sees footnotes 1 and 2) showed the same pattern of results but the differences between Debate and Brainstorming were diminished. It is possible that there was enhanced group identification and possibly a norm discouraging conflict at that time, especially since nearly 3000 lives were lost in the World Trade Center alone. Such a possibility is consistent with work showing the importance of group identification and group norms for enhancing or diminishing basic cultural values (Haslam, Postmes, & Ellemers, 2003; Jetten, Postmes, & McAuliffe, 2002). This of course is speculative but raises the potential importance of contextual factors.

The basic finding, however, is that the encouragement of debate—and even criticism if warranted—appears to stimulate more creative ideas. And cultures that permit and even encourage such expression of differing viewpoints may stimulate the most innovation (Nemeth, 1997). Our hope is that this research will stimulate a reexamination of normative environments and the role of authentic differences as positive forces.

ACKNOWLEDGEMENTS

This research was supported by grants from the Institute for Industrial Relations and from the Committee on Research, University of California, Berkeley, and they are gratefully acknowledged.

REFERENCES

Amabile, T. M. (1983). *The social psychology of creativity*. New York: Springer-Verlag.

Camacho, L. M., & Paulus, P. B. (1995). The role of social anxiousness in group brainstorming. *Journal of Personality and Social Psychology, 68*, 1071–1080.

De Dreu, C. K. W., & West, M. A. (2001). Minority dissent and team innovation: The importance of participation in decision making. *Journal of Applied Psychology, 86*, 1191–1201.

De Dreu, C. K. W., Harinck, F., & Van Vianen, A. E. M. (1999). Conflict and performance in groups and organizations. In C. L. Cooper, & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (Vol. 11, pp. 367–405). Chichester, UK: Wiley.

Delbecq, A. L., Van de Ven, A. H., & Gustafson, D. H. (1974). *Group techniques for program planning: A guide to nominal group and Delphi processes*. Glenview, IL: Scott Foresman.

Diehl, M., & Stroebe, W. (1987). Productivity loss in brainstorming groups: Toward the solution of a riddle. *Journal of Personality and Social Psychology, 53*, 497–509.

Dugosh, K. L., Paulus, P. B., Roland, E. J., & Yang, H.-C. (2000). Cognitive stimulation in brainstorming. *Journal of Personality and Social Psychology, 79*(5), 722–735.

Dunnette, D., Campbell, J., & Jaastad, K. (1963). The effect of group participation on brainstorming effectiveness for 2 industrial samples. *Journal of Applied Psychology, 47*(1), 30–37.

Hargadon, A., & Sutton, R. I. (1997). Technology brokering and innovation in a product development firm. *Administrative Science Quarterly, 42*, 716–749.

Haslam, S. A., Postmes, T., & Ellemers, N. (2003). More than a metaphor: Organizational identity makes organizational life possible. *British Journal of Management, 14*(4), 357–369.

Jehn, K. A., & Mannix, E. A. (2001). The dynamic nature of conflict: A longitudinal study of intragroup conflict and group performance. *Academy of Management Journal, 44*(2), 238–251.
Jetten, J., Postmes, T., & McAuliffe, B. J. (2002). We're all individuals: Group norms of individualism and collectivism, levels of identification and identity threat. *European Journal of Social Psychology, 12*, 189–207.
Karau, S. J., & Williams, K. D. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology, 65*, 681–706.
Kasof, J. (1995). Explaining creativity: The attributional perspective. *Creativity Research Journal, 8*, 311–366.
Larey, T. S., & Paulus, P. B. (1999). Group preference and convergent tendencies in small groups: A content analysis of brainstorming performance. *Creativity Research Journal, 12*, 175–184.
Locke, E. A., & Latham, G. P. (1990). Work motivation and satisfaction: Light at the end of the tunnel. *Psychological Science, 1*, 240–246.
Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35 year odyssey. *American Psychologist, 57*, 705–717.
Martin, R., & Noyes, C. (1996). Minority influence and argument generation. In C. J. Nemeth (Ed.), *British Journal of Social Psychology: Special Issue on Minority Influence, 35*, 91–103.
McGrath, J. E. (1984). *Groups: Interaction and performance*. New York: Prentice Hall.
Milliken, F. J., & Martins, L. (1996). Searching for common threads: Understanding the multiple effects of diversity in organizational groups. *Academy of Management Review, 21*, 402–433.
Moscovici, S. (1980). Towards a theory of conversion behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 13, pp. 209–239). San Diego, CA: Academic Press.
Mugny, G. (1982). *The power of minorities*. London: Academic Press.
Nemeth, C. (1995). Dissent as driving cognition, attitudes and judgments. *Social Cognition, 13*, 273–291.
Nemeth, C. (1997). Managing innovation: When less is more. *California Management Review, 40*, 59–74.
Nemeth, C. J. (2003). Minority dissent and its 'hidden' benefits. *New Review of Social Psychology, 2*, 11–21.
Nemeth, C., & Nemeth-Brown, B. (2003). Better than individuals? The potential benefits of dissent and diversity for group creativity. In P. Paulus, & B. Nijstad (Eds.), *Group creativity* (pp. 63–84). Oxford: Oxford University Press.
Nemeth, C., Mosier, K., & Chiles, C. (1992). When convergent thought improves performance: Majority vs. minority influence. *Personality and Social Psychology Bulletin, 81*, 139–144.
Nemeth, C., Brown, K., & Rogers, J. (2001). Devil's advocate vs. authentic dissent: Stimulating quantity and quality. *European Journal of Social Psychology, 31*, 707–720.
Nemeth, C. J., & Nemeth, L. (2001). Understanding the creative process: Management of the knowledge worker. In J. Nonaka, & D. J. Teece (Eds.), *Managing industrial knowledge* (pp. 91–104). London: Sage Publications.
Nemeth, C. J., & Staw, B. M. (1989). The tradeoffs of social control and innovation within groups and organizations. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 22, pp. 175–210). New York: Academic Press.
Osborn, A. F. (1957). *Applied imagination*. New York: Scribner.
Parnes, S. J., & Meadow, A. (1959). Effect of brainstorming instructions on creative problem solving by trained and untrained subjects. *Journal of Social Behavior and Personality, 11*, 633–646.
Paulus, P. B., & Dzindolet, M. T. (1993). Social influence processes in group brainstorming. *Journal of Personality and Social Psychology, 64*, 575–586.
Paulus, P. B., Brown, V., & Ortega, A. H. (1999). Group creativity. In R. E. Purser, & A. Montuori (Eds.), *Social creativity* (Vol. 2, pp. 151–176). Cresskill, NJ: Hampton.
Paulus, P. B., Larey, T. S., & Dzindolet, M. T. (2000). Creativity in groups and teams. In M. Turner (Ed.), *Groups at work: Advances in theory and performance* (pp. 319–338). Hillsdale, NJ: Erlbaum.
Pérez, J. A., & Mugny, G. (1993). *Influences sociales. La théorie de l'élaboration du conflit.* Neuchâtel, Paris: Delachaux et Niestlé.
Personnaz, M., & Personnaz, B. (1994). Perception and conversion. In S. Moscovici, A. Mucchi-Faina, & A. Maass (Eds.), *Minority influence* (pp. 165–183). Chicago: Nelson-Hall Publishers.
Postmes, T., Spears, R., & Cihangir, S. (2001). Quality of decision making and group norms. *Journal of Personality & Social Psychology, 80*(6), 918–930.
Sternberg, R. J. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity.* New York: Free Press.
Van Dyne, L., & Saavedra, R. (1996). A naturalistic minority influence experiment: Effects on divergent thinking, conflict, and originality in work-groups. *British Journal of Social Psychology, 35*, 151–168.
West, M. A., & Farr, J. L. (1990). *Innovation and creativity at work: Psychological and organizational strategies*. Chichester, England: Wiley.
Williams, K. Y., & O'Reilly, C. A., III. (1998). Demography and diversity in organizations: A review of 40 years of research. *Research in Organizational Behavior, 20*, 77–140.

