



# Productivity is not enough: A comparison of interactive and nominal brainstorming groups on idea generation and selection <sup>☆</sup>

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## Abstract

The conclusion that nominal brainstorming groups outperform interactive brainstorming groups has been exclusively based on studies of idea generation. This study tested whether the productivity advantage of nominal groups would also result in better idea selection. Nominal and interactive groups performed a task that involved idea generation and selection. Idea generation and selection were strictly separated for half the groups, but were combined for the other half. Nominal groups generated more ideas than interactive groups, and the ideas generated by nominal groups were more original and less feasible than the ideas generated by interactive groups. However, there were no differences among conditions in quality of the selected ideas. Further, idea selection was not significantly better than chance. This suggests that high productivity in brainstorming is not sufficient to lead to better solutions. © 2005 Elsevier Inc. All rights reserved.

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## Introduction

Ever since the publication of Osborn's (1953) influential book *Applied Imagination*, many organizations consider group brainstorming as a particularly effective technique for generating large numbers of creative ideas. This popularity persists despite repeated findings that brainstorming groups generate fewer ideas, and fewer good ideas, than individual brainstormers whose ideas

are pooled (so-called nominal groups; e.g., Diehl & Stroebe, 1987; Taylor, Berry, & Block, 1958). In fact, most people continue to believe that group brainstorming yields more ideas than individual brainstorming. This false belief has been dubbed "the illusion of group effectivity" (Paulus, Dzindolet, Poletes, & Camacho, 1993; Stroebe, Diehl, & Abakoumkin, 1992).

As a result of this discrepancy between research findings and everyday beliefs, brainstorming research has focused almost exclusively on productivity (i.e., number of ideas generated) as a dependent variable (Sutton & Hargadon, 1996), studying possible explanations for the productivity loss in interactive brainstorming groups (e.g., Diehl & Stroebe, 1991; Paulus & Dzindolet, 1993) and ways to minimize productivity loss (e.g., Gallupe, Bastianutti, & Cooper, 1991). Considering that the brainstorming procedure was designed with the specific goal of boosting productivity, this makes sense. However, when brainstorming is regarded as an innovation tool, this focus is too narrow. After all, producing

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large numbers of ideas is never the ultimate goal of a brainstorming session. Instead, what brainstormers are after is a limited number of good ideas to select for further development and, eventually, implementation (Nijstad & De Dreu, 2002). Thus, for creativity to become innovation, divergent idea generation must be followed by convergent idea selection. Given the neglect of idea selection as a research topic, we agree with Sutton and Hargadon (1996) that “it is premature to conclude that face-to-face brainstorming groups are ineffective” (p. 688). It should first be assessed whether the higher productivity of nominal groups also leads to a higher quality of selected ideas. The primary aim of our study is to answer this question through a comparison of interactive and nominal groups on a task that involves both idea generation and idea selection.

Even though idea generation and idea selection are both essential parts of the innovation process, combining them effectively is considered an onerous task. Brainstorming conventions dictate that idea selection should be separated from idea generation as strictly as possible. An important ‘active ingredient’ (Smith, 1998) in the brainstorming procedure is the deferment of judgment: people are thought to generate more ideas when they feel free of evaluation and criticism (e.g., Amabile, 1979; Hennessey, 1989), so separation of idea generation and selection is essential. Although the brainstorming literature provides some support for this assumption (e.g., Camacho & Paulus, 1995; Diehl & Stroebe, 1987), it remains an open question whether this task separation has any effects on the quality of selected ideas. Thus, our second aim is to study whether the recommended separation between idea generation and selection improves the quality of selected ideas. In this study, we manipulate this task separation by presenting idea generation and idea selection either as two separate tasks, or as one task consisting of two activities (idea generation and selection).

#### *Idea selection in interactive and nominal groups*

The outcome of idea selection is dependent on two factors: the quality of the available ideas, and the quality of the selection process. Our manipulation of group interaction could have opposing effects on these factors. With regard to idea generation, the superiority of nominal groups is clear. In line with Osborn’s (1953) proposal that quantity breeds quality, research has shown a strong correlation between the total number of ideas generated and the number of good ideas available therein (Diehl & Stroebe, 1987). Nominal groups generate more ideas than interactive groups, and hence have more good ideas to choose from.

With regard to the selection process, however, it is less obvious what to expect. On the one hand, various sorts of process loss can lead to suboptimal idea selection in interactive groups. For example, decision making groups

often fail to discuss all relevant information and to consider all available alternatives (see Stasser, 1999). Of course, effective selection largely rests on a thorough consideration of available options. If interactive groups do not consider the options at their disposal, they cannot be expected to compensate for their lower productivity. One plausible prediction, therefore, is that the quality of selected ideas will be higher for nominal groups than for interactive groups.

On the other hand, several studies have demonstrated that groups can outperform individuals, particularly on intellectual tasks. For example, Laughlin and colleagues (Laughlin, Bonner, & Altermatt, 1998; Laughlin & Shippy, 1983; Laughlin, VanderStoep, & Hollingshead, 1991) found that groups performed better than individuals on a task in which participants had to decide between hypotheses to account for certain patterns. Although idea selection is not an intellectual, but a judgmental task, group discussion clearly can improve the selection process. Thus, one could also predict that interactive groups will overcome their lower productivity, and will select ideas that are at least as good as those selected by nominal groups.

#### *Separation of idea generation and selection*

We expect that presenting idea generation and idea selection as one task will make the evaluative aspect inherent in idea selection more salient during idea generation, and that this will inhibit productivity. This effect should be especially strong in interactive groups, for two reasons: First, only in interactive groups can members be evaluated by others; thus, we expect any manipulation that increases evaluation apprehension to have a stronger effect for interactive than for nominal groups. Second, interactive groups suffer from production blocking: Members of interactive groups have to take turns expressing their ideas, and this interferes with group members’ idea generation and expression (Diehl & Stroebe, 1991). We expect that removing the task separation will exacerbate this production blocking, because group members will devote more time to explaining their ideas, which means that other group members will have to wait longer before they can express their ideas.

The presence or absence of a strict task separation could influence idea selection in two ways. If the separation of idea generation and selection enhances productivity, more ideas are available for selection; this in turn could lead to the selection of better ideas as compared to the situation in which generation and selection are not strictly separated. However, because removing the task separation should cause brainstormers to devote more time to idea evaluation, even while still generating ideas, it could also improve the selection process. Therefore, it is possible that even though productivity will be negatively affected by removing the traditional task separation, the quality of the selected ideas will not be negatively affected.

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