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THE EFFECTS OF PAIRING PARTICIPANTS IN FACILITATED GROUP SUPPORT SYSTEMS IDEATION SESSIONS

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ABSTRACT

Group Support Systems (GSS) have been used to support facilitated ideation sessions for years and have been studied from a number of different perspectives. Throughout this time the norm for running electronic brainstorming sessions has been for participants to work on their own workstations. A review of applicable literature suggests that pairing participants at GSS workstations could result in higher quality inputs and participant satisfaction. This proposition is examined with a lab experiment to test for differences between paired and unpaired facilitated GSS sessions. The results of the experiment suggest that pairing participants does yield higher quality ideas from facilitated ideation without negative perceptions relating to production blocking.

Keywords

Group Support Systems, Ideation, Production Blocking, Evaluation Apprehension,.

INTRODUCTION

One of the most common reasons for bringing a group of people together in a business setting is to generate ideas. Osborn (1957) in his book *Applied Imagination* described a process to “use the brain to storm a creative problem” and dubbed the practice “brainstorming.” Osborn’s approach to ideation has been used many times since then with a variety of techniques. In more recent times this practice has been reexamined in light of emerging information technologies (IT). Specifically, practitioners have used IT in different ways to improve the effectiveness of brainstorming sessions. In fact, the entire segment of computer applications called Group Support Systems (GSS) was developed to help groups in a wide range of tasks, including brainstorming.

The norm for setting up technology-based electronic brainstorming sessions has been to have each participant in a session operate at their own workstation (Dennis & Reinicke 2004; Briggs, Nunamaker, & Sprague 1997; Gallupe et al. 1992). This configuration is intended to eliminate the potential effects of production blocking and evaluation apprehension (ibid). However, occasionally circumstances might

dictate pairing participants at workstations. One area where the performance of pairs has been examined is the use of “pair programming” in software projects. “Pair programming is a practice in which two programmers work together at one computer, collaborating on the same design, algorithm, code or test” (Stotts et al. 2003). Researchers have found that pairing results in higher levels of productivity, satisfaction (Cao & Xu 2005), improved team communications and knowledge sharing within programming teams (Williams et al. 2000).

In view of the above, this research proposes to explore the effects of pairing participants at GSS workstations for facilitated ideation sessions. Specifically, this study seeks to determine if there is a change in either the quality of the ideas generated or participants’ satisfaction as a result of being paired at GSS workstations. Knowing the answer to this question is important for several reasons. First, on a practical level, if this study shows that facilitators can pair participants at workstations without impacting session quality or satisfaction, they could get more people through facilitated sessions with less equipment and time. Second, a review of current literature suggests that pairing may produce both higher quality ideas and higher level of satisfaction of session participants.

The rest of the paper is organized as follows. The next section of this paper will review relevant research on ideation, GSS, and evaluative tone. Following this, we present the research questions and describe a lab experiment designed to empirically examine them. This is followed by a discussion of the results of the experiment and implications for future research and practice.

BACKGROUND

Several streams of research form the foundation for examining paired ideation. We specifically focus our attention on research relating to the notions of ideation, the design and use of GSS, and evaluative tone.

Ideation

Osborn’s (1957) concept of creative group collaboration has been the foundation of countless ideation sessions. The core of Osborn’s approach was the notion that when a group worked together to generate ideas, each person’s contributions would trigger another idea within his or her own mind and could also spark ideas in his or her colleagues’ minds. Osborn labeled this synergistic effect the “two-way current” of group collaboration and described a significant boost in both the number and quality of ideas a group could generate.

Practitioners conducted brainstorming sessions in a wide variety of ways with what they perceived as acceptable results (Taylor, Berry, & Block 1958; Gallupe et al. 1992). But academic study revealed problems with the practice. Taylor, Berry, and Block (1958) conducted one of the earliest formal studies of Osborn’s ideas and showed that group participation actually inhibited creative thinking in their study. Two problems that drew particular attention in other studies were production blocking and evaluation apprehension (Diehl & Stroebe 1991). Production blocking occurs when participants must wait until another participant is done sharing her idea with the group; people forget ideas or miss intermediate discussion while waiting their turn (Diehl & Stroebe 1991). Diehl and Stroebe went on to explain that evaluation apprehension occurs when a participant elects not to share an idea with the group out of “fear of negative evaluations” (ibid p 393). Examination of these drawbacks showed that both could be overcome with the use of computer-assisted ideation techniques (Gallupe et al. 1992).

Group Support Systems (GSS)

GSS have come to encompass a number of functionalities and technologies related to improving the performance of groups in a variety of roles. This paper focuses solely on the ideation aspect of GSS, which is also known as Electronic Brainstorming (EBS). EBS resembles traditional brainstorming in that individual members contribute ideas related to a specific topic and other participants can see those contributions to combine and elaborate on those ideas to improve overall results. But EBS differs from traditional brainstorming sessions in that EBS has specific features that ameliorate the negative effects of production blocking and evaluation apprehension (Briggs, Nunamaker, & Sprague 1997). GSS overcomes the production blocking problem because everyone has access to a workstation so ideas can be entered in parallel, eliminating the need to wait for others to finish articulating their idea and then to get recognized for your turn (Gallupe et al. 1992). Most GSSs also have an anonymity feature that allows participants to enter ideas without having those ideas attributed to the specific contributor. This anonymity feature should alleviate participant concerns about being linked to an idea deemed “bad” by the group, thereby reducing potential negative effects of evaluation apprehension (Dennis & Reineke 2004; Gallupe et al. 1992).

The effects of production blocking and evaluation apprehension have been examined in several studies, and the magnitude of those effects has been linked to the size of the ideation group (Valacich & Schwenk 1995; Gallupe et al. 1992). As such, another stream of research has focused on identifying the right number of participants for ideation sessions. Pinsonneault, Barki, Gallupe, and Hoppen (1999b) found that while increasing group size did have a positive effect on ideation, larger groups also introduced the possibility of additional process losses which could reduce positive effects. One of these effects included cognitive overload—becoming inundated with too many ideas being generated by others. The use of paired brainstorming, with fewer active workstations, could alleviate the cognitive load effects found in earlier research.

The other effect, social loafing, was initially studied over a hundred years ago by Ringelmann (as cited in Kravitz & Martin 1986). It is described as the reduction in effort that results when individuals are not directly accountable for their performance in group tasks. This description closely matches how EBS works, where anonymity is commonly used for ideation sessions (Dennis & Reinecke 2004). However, the paired-participant approach in this study may help overcome the effect of social loafing since each participant’s contributions will be immediately visible to another participant. Harkins (1987), in his “Social Loafing and Social Facilitation” study, found that when participants worked together on a task, “their outputs can be compared and they work harder than participants working alone” (p. 15). He called this a social comparison effect, said this effect was a form of evaluation that would overcome social loafing.

Evaluative Tone

Osborn recognized the potential deleterious effects of negative evaluation in a brainstorming session and strongly counseled enforcing a “no judging” rule for his brainstorming sessions. But there is evidence to indicate that groups with higher numbers of critical comments injected into the ideation session outperform groups with fewer critical comments (Connolly et al. 1990). This occurs because critical comments cued people to further examine their original idea and offer more follow-on comments to elaborate and improve on the original submission (ibid). Interestingly, groups with more critical comments in Connolly, Jessup, and Valacich’s study scored higher in terms of objective measurement of their performance but rated their satisfaction with the sessions lower. This reduced satisfaction effect is of interest in our study since it is possible that pairing participants may expose them to critical comments from their partner, thereby lowering their perceived satisfaction.

RESEARCH QUESTION

As discussed above, the overall research question for this study is, *does pairing participants affect the results of ideation in a facilitated GSS session?*

Despite the apparent benefits of being able to answer this basic question positively, there are difficulties in addressing the question because the relationships between applicable theories are unclear in the scenario of pairing participants in GSS sessions. Previous studies have shown GSS improves ideation and while production blocking and evaluation apprehension may be reintroduced to some extent in the paired-participant configuration, pairing may help alleviate potential social loafing. Paulus and Dzindolet (1993) examined this partnership effect in their study titled “Social Influence Processes in Group Brainstorming.” In that study, they found that members of interactive groups are influenced by the performance of their partners, and that the competitive aspects of partnered brainstorming caused performance increases of such magnitude that the increased productivity compensated for procedural blocking effects. In a traditional GSS session, participants work independently at workstations so the impact of evaluative tone is determined by the degree to which the participants read the comments of other participants. The treatment group in this experiment will be different from that “standard” configuration in that each person’s ideas will be seen by at least his partner as the ideas are entered. So, will pairing participants in the manner prescribed by this study elicit enough of an evaluative tone to compensate for any losses pairing may cause?

Dennis and Reinicke (2004) introduced another aspect in their study of EBS that may apply to this study of pairing participants. They recognized that the traditional individual-participant configuration led to a lack of verbal interaction that lowered participant satisfaction since the silence neglected the social needs of groups, such as verbal recognition for a valuable contribution. If their prognostication holds, this study’s paired-participant configuration may result in higher satisfaction ratings for the paired-participant sessions.

The recognition that participants will only continue to use a GSS tool if they like it is an important driver for the following research questions. The specific research questions to be examined in this research are as follows:

- *Question 1:* Is the quality of ideas from paired-participant sessions as good as the quality of ideas from traditional GSS sessions?
- *Question 2:* Do participants in paired-participant sessions express similar levels of perceived satisfaction as those in traditional GSS sessions?
- *Question 3:* Do participants in paired-participant sessions perceive a stronger effect of production blocking than those in unpaired sessions?
- *Question 4:* Do participants in paired-participant sessions perceive a stronger effect of evaluation apprehension than those in unpaired sessions?

RESEARCH DESIGN

This research used a lab experiment with pairing participants as the treatment (contrasted with individual participants). Two sessions were conducted in each of the paired and unpaired configurations with six workstations in each session. The same GSS tool and facilitator was used for all sessions. The sessions were conducted in the same room and were arranged so that two groups of participants heard the same things in the same setting. The sessions were scripted so that the facilitator presented information and instructions in the same way at each session. The experimental subjects were all students and represented

a mix of grade-levels and academic disciplines from two classes at a Midwestern metropolitan university: Introduction to Statistics and Organizations, Applications and Technology. The experimental task involved addressing the following questions: 1) What are ways to introduce new students to social activities? 2) What are ways to improve the parking situation on campus? and 3) What are ways to improve campus security?

ANALYSIS OF RESULTS

The sessions were scored in terms of the quality of the participants' ideas and the participants were surveyed on their perceptions of three constructs relevant to the study—satisfaction, production blocking, and evaluation apprehension.

For research question 1, “*Is the quality of ideas from paired-participant sessions as good as the quality of ideas from traditional GSS sessions?*” the unit of analysis is session results. Table 1 identifies the instrumentation for each construct.

Construct	Measurement
Session Quality	Independent judge rates the feasibility and originality of each non-redundant idea on a five-point Likert scale. Those scores were added to establish a quality score for the idea, and the individual idea scores were summed to generate an overall quality score for the session (Gallupe et al. 1992)
Quality of Ideas	An idea with a quality score of 7 or higher. (Gallupe et al. 1992)
Elaboration	Calculate an elaboration coefficient by dividing the number of elaborations by the total number of non-redundant, task-oriented ideas in the session. Yields a number in the range of 0.0 and 1.0, with a higher number indicating a higher degree of elaboration in that session (Vreede et al. 2000)
Satisfaction	Measured via survey administered at the end of each session. Specific questions for this phenomenon of interest listed in Table 3 (Gallupe et al. 1992)
Production Blocking	Measured via survey administered at the end of each session. Specific questions for this phenomenon of interest listed in Table 3 (Gallupe et al. 1992)
Evaluation Apprehension	Measured via survey administered at the end of each session. Specific questions for this phenomenon of interest listed in Table 3 (Gallupe et al. 1992)

Table 1. Instrumentation

Table 2 summarizes the overall quality assessment for the sessions. With only four sessions total (two for each configuration), no statistically significant conclusions can be drawn from this experiment. However, the results show that paired participants outperformed unpaired participants in every measure of session quality for the sessions conducted. Both paired groups scored higher in session quality than either of the unpaired groups and had lower elaboration coefficients. This result was also validated by the counts of “high-quality” ideas where the paired groups outperformed unpaired groups across the board.

Group	Session Quality	Elaboration Index	High Quality Ideas
Unpaired 1	233	0.33	10
Unpaired 2	245	0.39	10

Paired 1	289	0.09	13
Paired 2	324	0.30	23

Research Questions two through four dealt with participant perceptions of the process and were measured via a paper survey administered at the end of each session. Table 3 below shows each question within each measured construct along with the results. The paired groups scored slightly lower (or equal on some individual questions) on the satisfaction and evaluation apprehension constructs. One possible explanation for the slightly higher satisfaction ratings from the unpaired participants could be that those students had a lecture on the benefits and uses of GSS before the experiment. Interestingly, the paired group scored more favorably on the production-blocking construct, indicating that they felt less impact in this area than unpaired participants.

Survey questions	Unpaired Groups	Paired Groups
Research Question 2: Satisfaction		
Were you satisfied with the process used today?	4.08	3.96
Would you advocate this process for others to use to generate ideas?	4.17	4.00
Research Question 3: Production Blocking		
Could you express your ideas immediately as you thought of them?	4.17	4.38
Were you able to express all of the ideas that occurred to you?	3.83	4.13
Did you have to wait to express ideas?	2.08	1.71
Research Question 4: Evaluation Apprehension		
Did you feel at ease entering your ideas into the computer system?	4.50	4.25
Did you feel apprehension about entering your ideas into the system?	2.00	2.00
Did you feel comfortable entering ideas into the system?	4.58	4.29
Scoring: 5-point Likert scale; "1" indicates Strongly Disagree and "5" indicates Strongly Agree		

Table 3. Survey Questions and Results

CONCLUSIONS

In sum, this study confirmed that the quality of inputs in a paired-participant session is as good as the quality of traditional facilitated sessions using GSS. Moreover, exit survey results suggest that pairing participants did not negatively affect participant's satisfaction with the facilitated session. The study results also provide some directions for further research. The next step in building scientific knowledge would be to conduct more extensive tests to solidify the initial results indicating by our research. If the paired-ideation phenomenon holds up under more rigorous testing, another step would be to begin to solidify the theoretical basis for why pairing affects session quality. Extending this notion further, another area to explore is the notion that pairing participants may yield different results when used against different types of problems. Additional research could also focus on identifying specific types of problems that might be best suited to pairing participants. Potentially, this might lead into combining different collaboration activities into a full-blown multi-step collaboration session tailored to exploit the benefits of paired-participants. Finally, another area of research that could be explored is the notion that pairing participants may increase satisfaction by attending to other group interaction needs.

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