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PROCESS-CONTROL EFFECTS FOR TEAM-BASED COMPUTER-MEDIATED DECISION ANALYSES

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INTRODUCTION

As the evolution of research in Group Support Systems (GSS) continues, focus must begin to shift away from the concentration of GSS groups versus non-GSS groups, and begin to direct scrutiny toward the examination of the group dynamics that influence the experience of the teams that use GSS. The literature has clearly established that GSS improves the quality of certain decisions. The new challenge is to discover what processes within GSS are responsible for decision improvement and how they interact with other group processes extant in work situations.

LITERATURE SUPPORT

Although the literature is replete with studies of GSS's, computer conferencing, electronic meeting systems, and assorted variations of GSS type systems, the bulk of these studies focus exclusively on the comparison of GSS versus non-GSS groups. Synopses of these studies are presented in literature reviews Chidambaram and Bostrom (1993), George (1992), Dennis et al. (1988), Gallupe and DeSanctis (1988), among others. Few studies directly distinguish and examine the dynamics of groups as teams (as opposed to randomly associated groups of individuals) with regard to the commonly examined group performance variables of decision quality, decision efficiency, and interpersonal behavior, nor the decision perception variables of individual satisfaction, procedural justice and equity of the decision process.

One study in particular addressed the need to examine the role of groups as teams. Chidambaram, Bostrom and Wynne (1991), examined the impact of GSS on group development to determine if computer support affects the development of decision-making groups and whether patterns of development differ over time between computer-supported and manual groups. They concluded that "after adapting to GSS, computer-supported groups displayed more productive conflict management and higher group cohesiveness than manual groups" (Chidambaram, Bostrom and Wynne, 1991, p.8).

While these studies have demonstrated that GSS can enhance cohesion, they do not address the effect that team development will have on the GSS experience. In work environments, the development of higher levels of team cohesion and commitment is associated with higher productivity and unidimensionality of team attitudes toward performance (Scott and Townsend, 1994). Drawing from this research, we would expect to see that team development would enhance the GSS experience as well. Teams (as

opposed to random groups), are generally more comfortable with collective resolution of problems; thus a team working with GSS should exhibit more acceptance of both the decision procedure and the decision outcome than would a random group (Wall, et al, 1986).

RESEARCH DESIGN

Based upon a review of the relevant literature the following research hypotheses were formulated:

H1: Team-based GSS groups will perform better in the decision exercises as measured by decision quality and decision efficiency than non-team-based GSS groups.

H2: Team-based GSS group members will experience a higher degree of satisfaction with the decision process than non-team-based GSS group members.

H3: Team-based GSS group members will experience a higher degree of decision equity with the decision process than non-team-based GSS group members.

H4: Team-based GSS groups will experiences a greater perception of procedural justice than non-team-based GSS groups.

Subjects were composed of upper-level undergraduate students enrolled in an introductory information systems class at a major western university. The students, who are primarily business majors, received course credit for their participation. A large number of the subjects are also full-time employees, attending classes at night.

Two experiment treatments will be evaluated simultaneously, yielding a 2x2 experimental design. A graphical presentation of the experimental design is shown below.

	Team-Building Sessions	No Team Building Sessions
GSS Facility Utilization	9 Groups of 6	9 Groups of 6
No GSS Facility Utilization	9 Groups of 6	9 Groups of 6

The first treatment is the administration of team-building skills within the groups. Some groups will experience the team building session, others will not. The second treatment involves use of the GSS facility. Again, some groups will utilize the facility, others will not. Groups not utilizing the GSS facility will complete the experimental tasks using face-to-face, non-computer-assisted discussion. Each treatment combination will have nine groups of six individuals. Thus the total number of participants in this study is 216.

All subjects were provided with a pre-questionnaire incorporating a series of personality and learning style inventories. These would be used in data analysis to determine the influence of decision making temperament with regard to the study variables of interest. The data analyses will utilize multivariate techniques to identify and measure differences between the groups based upon the experimental treatments in the 2x2 research design. Additionally, some univariate analysis is anticipated between subject groups within each cell.

The GSS experiment itself consisted of two phases. In the initial phase each group of six was given a brief overview of the conduct of the experiment, and provided with a walk-through on the operation of the GSS workstations. They were read the overview of the scenario and then led through a ranking problem addressing the need to prioritize a list of items in a survival situation. Their individual rankings were electronically tabulated, and the consolidated list reviewed on the public screen. They were then allowed 10 minutes to verbally discuss their preferences and to reflect on their initial ranking of any items. Subject were then given an opportunity to re-rank these items in a subsequent GSS ranking sessions. However, subjects were not provided the final result of the second group rankings. This was to prevent an impression of good or bad group performance before their perceptions of satisfaction and equity were evaluated.

The second phase of the GSS experiment comprised an ethical dilemma involving the selection of one individual to receive medical treatment from a list of five candidates.

This problem was selected from A Handbook of Structured Experiences for Human Relations Training (Pfeiffer and Jones, 1969) . The subjects were briefed on their role as hospital administrators. Their task was to select the sole patient to receive treatment, based upon biographical and psychological profiles of each patient, which was provided to them. The problem was structured into three stages, beginning with the nomination of a candidate, along with a brief, written justification as to why the candidate was nominated. The second stage allowed the subjects to review the nominations, and, through the anonymity of the GSS, support or criticize candidates. The subjects were allowed 10 minutes to comment on the candidates or other comments written by group members. The subjects were then asked to vote on a single candidate, again through the GSS. In the event of a tie, re-vote was conducted to arrive at a clear majority. The re-vote was done with the understanding that failure to arrive at a clear majority would result in the denial of medical treatment to all patients. Upon completion of the experiment, subjects were provided with a post-session questionnaire which measured their satisfaction with the decision making process, their perceptions of justice and equity, and their expectations of anonymity in the decision process.

During the session, data was collected based upon the number of comments generated in the second session, and the coefficient of concordance in the first session as measures of decision efficiency and agreement respectively. Data was also collected on decision quality as compared to expert results of the first sessions.

Overall, the experiment was determined to examine the breadth of GSS type applications, examining tasks of *generation* in group comments, *negotiations*, in group discussion, and *choosing*, in item rankings and voting. These categories, proposed by DeSanctis and Gallupe (1987), present a multi-dimensional taxonomy of task structures as supported by the computer-aided decision support.

EXPECTED FINDINGS

Currently the experiment is in the last stage of data collection. Although final data analysis has not been completed, preliminary evaluation of data collected indicates that differences do exist between the treatments, but the statistical significance of this data remains to be examined.

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