

8-25-1995

An Experimental Examination of Group Information Sharing, Group Size, and Meeting Structures for Groups Using a Group Support System

Brian E. Mennecke
East Carolina University,

Follow this and additional works at: <http://aisel.aisnet.org/amcis1995>

Recommended Citation

Mennecke, Brian E., "An Experimental Examination of Group Information Sharing, Group Size, and Meeting Structures for Groups Using a Group Support System" (1995). *AMCIS 1995 Proceedings*. 29.
<http://aisel.aisnet.org/amcis1995/29>

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 1995 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

An Experimental Examination of Group Information Sharing, Group Size, and Meeting Structures for Groups Using a Group Support System

Brian E. Mennecke

School of Business, East Carolina University, Greenville, NC 27858

Abstract

This paper reports on an experimental study of information sharing for groups using a group support system (GSS). Information sharing is important because a group member's success or failure in sharing unique information that he or she alone possesses can have important impacts on the group's success. This research builds on work by Stasser and colleagues (Stasser & Titus, 1985, 1987, Stasser, Taylor, & Hanna, 1989, Stasser, 1992) which examined various factors that impact on group information sharing performance. To examine these issues, groups processed a hidden profile task; that is, a task with an asymmetrical distribution of information. In addition, group size (groups of size four and size seven) and the type of structure used during the meeting (structured or unstructured meeting agenda) were manipulated. The results for group size indicate that smaller sized groups were more likely to select a better solution, however, no significant differences were found related to group size for other performance measures or for the perceptual variables. The results for the meeting structure manipulation indicate that a structured agenda leads to better information sharing performance but that it also results in more negative perceptions about the meeting. The paper concludes with a discussion of the findings and the implications for future research and GSS use.

Introduction And Background

An important reason for people to communicate and meet together is to share information. Despite this, little research has been completed to examine the effectiveness of groups in sharing information (see Mennecke, Hoffer, & Valacich, 1995). Yet, information sharing performance can potentially be quite important in influencing a groups' success in solving problems and making decisions. An incomplete information search can result in inferior solutions being selected or developed by group members (Gouran, 1982).

The literature on information sharing is limited. Stasser and colleagues undertook the first systematic examination of this topic in several studies using tasks that were asymmetrical (i.e., each member had unique information) and which are designed to have hidden profiles (Stasser & Titus, 1985, 1987, Stasser, Taylor, & Hanna, 1989, Stasser, 1992). A hidden profile task is designed so that the true *profile* of an alternative in a case is *hidden* from each group member when they consider the task individually. Stasser and colleagues have consistently found that groups are not likely to discover hidden profiles

because individual members frequently fail to contribute the information that they do not hold in common (i.e., initially unshared information). Stasser and colleagues' research has examined variables such as group size, meeting structure, information load, information distribution, and bias. However, all of the published research by Stasser and colleagues has been conducted on groups which did not use any form of computer-mediated communication support. Only a handful of studies have examined information sharing performance for groups using computer mediated communication systems (i.e., group support systems or GSS) (see Mennecke et al., 1995, for a review).

Although important research has been completed to examine information sharing in non-computer supported settings, much needs to be done to better understand this issue for computer-supported groups. For instance, findings by Dennis (1992a, 1992b) suggest that group size may be an important factor influencing information sharing performance for GSS groups. Furthermore, Stasser and colleagues' research suggests that structuring the meeting can help groups discuss more information (Stasser et al., 1989; Stasser, 1992). Thus, the purpose of this research is to examine for GSS groups the influence of varying group sizes and different meeting structures on group outcomes.**H1***Larger groups will outperform smaller groups in information sharing performance.***H2***Larger groups will make superior decisions when compared to smaller groups.***H3***Larger groups will report greater satisfaction than smaller groups.***H4***Groups participating in a structured meeting will outperform unstructured groups in information sharing performance.***H5***Groups participating in structured meetings will make superior decisions when compared to groups in unstructured meetings. Groups in a structured meeting will report greater satisfaction than groups in unstructured meetings.*

Method

Subjects:

178 students from different sections of the same course participated in experimental groups. All subjects volunteered to participate and were randomly assigned to either a four- or seven-person group.

Task:

The task required that participants rank five student applicants based on suitability for admission to a university. Subjects were given admission criteria and instructed to read the criteria carefully prior to reading the candidate descriptions. The task was structured so that some information about each candidate was held by all members prior to the discussion (i.e., initially shared) and some information was held by one member prior to the discussion (i.e., initially unshared). All groups were told that they might have different information prior to the session. The number of pieces of information included in the case for groups of four was ten (6-shared, 4 unshared) while thirteen pieces were included for groups of seven (6 shared, 7 unshared). The quantity of information was changed for the different groups sizes to insure that information load (i.e., the amount of information each subject processed) was equal.

Experimental Procedures:

All groups completed the experimental task in the same setting. Group members were required to communicate using a GSS (VisionQuest). Subjects in the structured meeting treatments used a heuristic requiring that they first discuss information without stating a preference or voting and then discuss the case openly. Subjects in the unstructured meeting treatment discussed the case without any restrictions.

Experimental Measures:

The proportion of available information discussed represents a groups' information sharing performance (Stasser et al., 1989). Decision quality was based on the ratings provided by four admissions personnel at the university. All raters agreed on the ranking for the *best* candidate for admission, thus decision quality was evaluated using the proportion of groups that ranked the best candidate first. Green and Taber's (1980) instrument was used to capture perceptions of satisfaction.

Table 1: ANOVAs and Cell Means for Outcome Measures

Measure	Group Size	Structure	n	GS4 Struct	GS4 Unstruct	GS7 Struct	GS7 Unstruct
Shared Information *	F(1,33)=2.008; p=0.167	F(1,33)=22.366; p<0.001 Struct>Unstruct	34	47% (11)	27% (11)	56% (15)	31% (15)
Unshared Information *	F(1,33)=1.913; p=0.177	F(1,33)=28.631; p<0.001 Struct>Unstruct	34	31% (11)	14% (7)	25% (5)	12% (4)
All Information *	F(1,33)=0.946; p=0.338	F(1,33)=28.545; p<0.001 Struct>Unstruct	34	43% (8)	28% (8)	41% (8)	25% (6)
Decision Quality**	F(1,33)=6.150; p=0.019 GS4>GS7	F(1,33)=0.000; p=1.00	34	44% (67)	50% (78)	14% (64)	0.00% (0)
Solution Satisfaction	F(1,163)=0.336; p=0.563	F(1,163)=4.938; p=0.028 Struct<Unstruct	164** *	18.0 (3.3)	19.0 (3.3)	18.2 (3.0)	19.4 (3.4)
Process Satisfaction	F(1,163)=0.881; p=0.349	F(1,163)=6.990; p=0.009 Struct<Unstruct	164** *	19.0 (3.7)	20.5 (4.1)	18.3 (4.2)	20.1 (3.5)
Participation	F(1,163)=0.074; p=0.785	F(1,163)=17.229; p<0.001	164** *	17.0 (17.1)	18.4 (18.5)	16.5 (3.6)	19.2 (2.6)

		Struct > Unstruct)			
Time	F(1,32)=0.001; p=0.975	F(1,32)=6.639; p=0.015 Struct > Unstruct	33***	38 (4)	29 (6)	38 (8)	25 (8)

* Measured as the proportion of available information discussed

** Measured as the proportion of groups that selected the best alternative

***Indicates that missing data exists

Table 2: Covariation of Time with Information Sharing Performance

Measure	Group Size	Structure	Covariate (Time)
Shared Information	F(1,33)=2.207; p=0.148	F(1,33)=13.349; p=0.001	F(1,33)=14.560; p=0.001
Unshared Information	F(1,33)=2.040; p=0.164	F(1,33)=18.848; p < 0.001	F(1,33)=14.999; p=0.001
All Information	F(1,33)=1.373; p=0.251	F(1,33)=18.254; p < 0.001	F(1,33)=40.976; p < 0.001

Results

The results for group size indicate that, with the exception of quality (smaller groups selected the best candidate more often), there were no significant main effects (Table 1 & 2). On the other hand, with the exception of decision quality (no significant difference was found for decision quality across the structure manipulation), significant differences were observed across the meeting-structure manipulation for each of the dependent measures. Structured groups discussed more initially shared and unshared information. Structured groups also reported lower satisfaction and less participation. Finally, time was found to be a significant covariate with information sharing performance for shared information and unshared information (see Table 2). No significant interactions were observed.

Discussion And Conclusions

Findings for information sharing were mixed. The fact that group size had no significant influence on information sharing contradicted expectations. For instance, research conducted by Stasser and colleagues found that larger groups shared more information than smaller groups. Furthermore, research from the idea generation literature has generally found that larger GSS groups outperformed smaller GSS groups. These results suggest that the GSS may interact with group size for hidden profile tasks in unanticipated ways. In addition, however, it should be noted that the task used in the

current research is somewhat different than that used by Stasser and colleagues. Specifically, the task used here did not manipulate information load when the group size was changed; the task used by Stasser did manipulate information load when size changed with the result that members of larger groups had less information to process than smaller groups. It is possible that larger groups in Stasser and colleagues' study were able to outperform smaller groups because of these difference.

The findings related to the meeting structure manipulation were mixed. The results indicate that a structured heuristic which focuses group discussions on sharing information improves performance. This finding, combined with the observation that time is a significant covariate with information sharing, suggests that structure is useful in helping groups avoid premature convergence. It is not surprising that groups which spend more time discussing the case share a greater proportion of the information. It appears that the structured procedure effectively forced groups to be more diligent in exchanging information.

The results for satisfaction were contrary to expectations. It was expected that satisfaction and structure would be positively related to performance. Since no significant differences were observed for decision quality across the structure manipulation and since average satisfaction scores generally ran opposite to information sharing performance, these results suggest that either satisfaction is not strongly tied to group performance for this type of task or that subjects were not cognizant of their group's performance. The former of these possibilities is consistent with research that has examined the link between satisfaction and attitudes about the group and process. For instance, Mennecke et al. (1995) found that satisfaction was linked to group cohesion and Wheeler, Mennecke, and Scudder (1993) found that satisfaction was linked to personal preferences for procedural order. Thus satisfaction may be affected more by other factors besides performance in situations such as this. It is also possible, however, that groups which do a poor job of surfacing information will not recognize their inferior performance because they will also fail to discover the true profiles of the alternatives in the task. Failure to discover the true profile occurs because poor information sharing performance implies that only a subset of information about each alternative was surfaced and discussed. Thus, for hidden profile tasks, it is possible that satisfaction will only be positively correlated to performance when a critical proportion of information is shared by group members. In other words, satisfaction may have a curvilinear relationship to information sharing performance

Finally, the findings for decision quality were surprising. For instance, no relationship was observed between information sharing performance and decision quality. Theoretically, groups that surface and exchange more information about the case should be more likely to select the better admissions candidate. In this case, such a relationship did not appear to be present. In addition, the fact that smaller groups had superior decision quality suggests that it is possible that smaller groups were better able to integrate and process the information they surfaced since the total quantity of information they needed to process was less. Regardless, further research is clearly needed to examine the link between information sharing performance and decision quality.

This research was funded by the East Carolina University School of Business. The author wishes to acknowledge Brad Andrews, Laurie Askew, Laurie Eakins, Richard Hauser, Anthony Polito, Jack Thornton, T.J. Wagner, and Bill Wittman for their assistance with this research.

References

Dennis, A.R. (1992a). Towards an information theory of electronic group decision making. In *Proceedings of the 2nd Workshop on Information Technologies and Systems*.

Dennis, A.R. (1992b). Information processing in group decision making: Or you can lead a group to information, but you can't make it think. *University of Georgia Working Paper*.

Gouran, D.S. (1982). *Making decisions in groups: Choices and consequences*. Glenview, IL: Scott Foresman.

Green, S. G. & Tabor, T. D. (1980). The effects of three social decision schemes on decision group process. *Organizational Behavior and Human Performance* (25), 971-106.

Mennecke, B.E., Hoffer, J.A., & Valacich, J.S. (1995). An experimental examination of group history and group support system use on information sharing performance and user perceptions. In *the Twenty-Eighth Hawaii International Conference on System Sciences*, pp. 153-162.

Stasser, G., & Titus, W. (1985). Pooling of unshared information in group decision making: Biased information sampling during discussion. *Journal of Personality and Social Psychology* (48), 1467-1478.

Stasser, G., & Titus, W. (1987). Effects of information load and percentage of shared information on the dissemination of unshared information during group discussion. *Journal of Personality and Social Psychology* (53), 81-93.

Stasser, G., Taylor, L.A., & Hanna, C. (1989). Information sampling in structured and unstructured discussions of three- and six-person groups. *Journal of Personality and Social Psychology* (57), 67-78.

Stasser, G. (1992). Pooling of unshared information during group discussions. in S. Worchel, W. Wood, & J.A. Simpson (eds.), *Group Process and Productivity*, Newbury Park, CA: Sage Publications, pp.48-67.

Wheeler, B.C., Mennecke, B.E., & Scudder, J.S. (1993). Restrictive group support systems as a source of process structures for high and low procedural order groups. *Small Group Research* (24:4), 504-522.