Effects of Computer-Mediated Communication on Group Negotiation: 
An Empirical Study

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Abstract

A laboratory experiment was conducted to test the impact of communication medium (computer-mediated versus face-to-face) on the performance of three-person groups with an integrative negotiation task. Negotiation process variables this study investigated were: conflict management behavior, judgment accuracy and negotiation time. Negotiation outcome variables considered were joint profit and satisfaction.

Results showed that computer-mediated groups used more distributive approach, perceived other group members’ priorities less accurately and took more time to reach a group agreement than did groups that used the face-to-face communication medium. It was also found that computer-mediated groups achieved lower joint profit and showed less satisfaction with the communication medium than did face-to-face groups.

1. Introduction

Negotiation is an interactive decision-making process in which parties reveal preferences, seek information, attempt to persuade others and adopt bargaining strategies (Thompson et al., 1990). Negotiation Support Systems (NSSs) are a special class of Group Decision Support Systems that emphasize computerized assistance for groups with a negotiation task. Research so far on NSS, has focused on identifying the relevant factors for structuring a NSS (see, for example, Anson and Jelassi, 1990). However, so far there are few studies that have empirically tested the impact of electronic communication on negotiators’ behaviors.

This study, therefore, was designed to investigate the impact of computer-mediated communication on negotiators’ behavior. The influence of communication medium was investigated by comparing negotiators’ performances in terms of negotiation process and outcomes.

2. Literature Review and Hypotheses

2.1 Characteristics of Computer-Mediated Communication

Numerous empirical studies have attempted to evaluate the impact of computer-mediated communication (CMC) systems on human task performance vis-a-vis Face-to-Face (F2F) communication. Most CMC research has been conducted using a cooperative problem-solving task. Based on the findings of previous studies on CMC, one could summarize the characteristics of CMC by discussing its effect on communication efficiency and on the social-psychological aspects of communication.

Communication Efficiency: Communication efficiency refers to the group members’ ability to function or to communicate data, ideas, opinions and feelings among themselves in the least wasteful manner (Siegel, 1986). The variables used to measure the communication efficiency of CMC systems are the time required to reach consensus, the number of remarks exchanged by group members, and the number of task-oriented remarks as a function of total remarks. Results indicate that CMC group members exchanged fewer remarks and took longer to reach consensus than did the F2F group.
claims that the less immediate electronic medium may concur in identifying de-individuation as a and a loss of identity and a consequent weakness of social whereby submergence in a group produces anonymity behavior. De-individuation is defined as the process communication, thus creating feelings of de- communication efficiency. verbal messages are passed through the channel (formal) or the degree to which paralinguistic messages are also delivered through the channel (informal) (Morley and Stephenson, 1969). Based on these criteria, CMC is low in information richness and high in communication mode formality. These features result in lower communication efficiency.

Social-Psychological Aspect: Prior studies demonstrate that there is more affective expression, both positive and negative, in CMC than in FtF. Negative affect comes out more strongly than positive affect in CMC (Johansen et al., 1979; Kerr and Hiltz, 1982; Siegel et al., 1986; Sproull and Kiesler, 1986). Siegel et al. (1986) concur in identifying de-individuation as a possible explanation for uninhibited and antinormative behavior. De-individuation is defined as the process whereby submergence in a group produces anonymity and a loss of identity and a consequent weakness of social norms and constraints (Festinger et al., 1952; Zimbardo, 1969). Kiesler et al. (1984) claim that characteristics of CMC such as paucity of social context information and few widely-shared norms governing its use serve to comprise some of the same conditions that are important for de-individuation, anonymity, and reduced self-regulation.

Computer-mediated communication is also known to be less intimate and immediate than FtF communication, thus creating feelings of de-personalization (Johansen, 1979; Kerr and Hiltz, 1982). 'De-personalization' is expected to have the benefit of diffusing the conflict, enabling members to focus more on issues and arguments and less on personal antagonism (Rice, 1984; Williams, 1977). Poole et al. (1991) claimed that the less immediate electronic medium may enable the group to face up to conflict more easily. This feeling of de-personalization enables group members to focus on the task rather than on personal issues (Poole et al., 1991). This feature satisfies one of the conditions for integrative bargaining that is 'focusing on the task rather than the person' (Fisher and Ury, 1981).

2.2 Theories on Negotiation

Based on the findings of previous studies on CMC with cooperative problem-solving tasks, one would characterize CMC as having the properties of 'low communication efficiency', 'de-personalization', 'de-individuation', and 'equal participation'. The question then arises as to how these properties of CMC affect group members' interaction in a negotiation task and whether these characteristics foster or inhibit integrative bargaining.

Task Type

The group task is a major variable that affects the group's problem solving process and its outcomes. The task is important because it impacts the skills required in the group to solve it, the measures of success of group performance, and the process the group uses to perform its task (Hackman, 1969; Morris, 1966).

Most previous literature on CMC has focused on cooperative decision making tasks. As McGrath (1984) points out, negotiation tasks differ from the other task types in terms of required group processes. The key process involved with the negotiation task is to resolve interest and/or pay-off conflicts. Negotiation tasks are more complex and difficult than cooperative problem solving tasks and, therefore, require a substantial amount of information exchange to identify and resolve differences between negotiators' interests. This cognitive requirement may increase the workload when operating in a new communication mode. Therefore an empirical investigation of how electronic communication affects group performance in a negotiation task appears worthwhile.

Structuring Negotiation Processes

Negotiation is a form of decision making in which two or more independent parties talk with one another in an effort to resolve their opposing interests and to make joint decisions (Pruitt, 1981). One way of exploring negotiators' behaviors is in terms of their approaches to conflict and negotiation. These approaches are termed "negotiation tactics or strategies" (Pruitt and Carnevale, 1980), "conflict handling behavior" (Ruble and Thomas, 1976), or "conflict management behavior" (Poole et al., 1991).

Three general modes of conflict management behavior have been distinguished: "avoidance", "distributive", and "integrative". In avoidance behavior,
way to deal with conflicting interests in most negotiation successful use (Anson and Jelassi, 1990; Bazerman and bargaining with the use of the integrative approach) is Carrell, 1987).

Barriers to using Integrative Bartinine;
situations, there are a number of obstacles to its negotiation settings (Pruitt, 1981). It also enhances organizational effectiveness in intra-organizational implementation of the reached agreement, and the desire for future interaction (Graham, 1985). It also enhances for outcomes that were lower in terms of individual and joint benefit than did negotiators who made accurate judgments about the other party (Thompson and Hastie, 1990) Social-Emotional Factors: Another barrier to integrative bargaining is the existence of social-emotional factors. Conflicts are exemplified by a number of social-emotional characteristics such as: intense emotional involvement in the issue, mutual distrust and little positive foundation in the relationship between negotiators, an unconscious or pre-conscious issue underlying the presented problem and wide disparity in the financial or personal power of the negotiators (Kessler, 1978; Anson and Jelassi, 1990). To achieve integrative bargaining solutions, therefore, requires both the understanding of the factors or the situations causing one to deviate from integrative bargaining and the elimination or minimization of these factors. It also requires an environment which supports the use of the integrative approach by negotiators. The following section describes an empirical investigation to explore these factors.

2.3 Research Hypotheses

This study seeks to answer the question: "How does computer-mediated electronic communication affect the negotiators' behavior?"

'De-individuation' appears to be contradictory to 'de-personalization'. De-individuation may shift group discussion to personal antagonism rather than to issues, whereas de-personalization directs group discussion to issues. De-individuation may intensify conflict and mutual distrust between negotiators and provide little positive atmosphere in the relationship between negotiators. Fisher and Ury (1981) report a positive correlation between de-individuation and the distributive approaches. The emotional involvement in the negotiation process is known as a social-emotional barrier for integrative bargaining (Kessler, 1978). These

Fixed-pie assumption: Suboptimal or inefficient outcomes in negotiation often result from the negotiators' inaccurate perceptions of their opponents (Thompson, 1991). Negotiators often assume that the "outcome pie" is fixed in nature and that, therefore, the other party's interests are completely opposed to their own. This assumption is labeled "the fixed-pie perception".

Prior research has shown that most negotiators hold such fixed-pie perceptions even in tasks with integrative potential. Negotiators who maintained their fixed-pie perception throughout the negotiation settled for outcomes that were lower in terms of individual and joint benefit than did negotiators who made accurate judgments about the other party (Thompson and Hastie, 1990)

Although integrative bargaining is the optimal way to deal with conflicting interests in most negotiation situations, there are a number of obstacles to its successful use (Anson and Jelassi, 1990; Bazerman and Carrell, 1987).

Avoidance tactics minimize explicit discussions of conflicts. These include statements that deny the presence of conflicts, shift the focus of conversations or communicate about conflicts indirectly and ambiguously (Sillars et al., 1982).

Negotiators using the distributive approach view negotiation as a 'win-lose' situation and pursue their own interests, without regard for others' needs or interests. In other words, they are assertive and noncooperative, and competition-oriented. They conceal information and employ pressure tactics (e.g., threats, positional commitments, and persuasive arguments) to elicit unilateral concessions.

On the other hand, negotiators using the integrative approach view negotiation as a 'win-win' situation, and exchange truthful information, generate more alternatives, and express support or a desire for reconciliation, such as compliments or concessions. The integrative approach, also called "coordinative behavior" (Magenau and Pruitt, 1979) or "soft negotiation" (Fisher and Ury, 1981) is to collaborate with the other party in search of a mutually acceptable solution.

Many researchers in the negotiation area claim that the integrative approach is the optimal way to deal with conflicting interests between negotiators. Integrative agreements are represented in negotiations where there exists no agreement that all parties would prefer more (Bazerman et al., 1988). The integrativeness of an outcome is measured by the magnitude of joint benefit that it provides to negotiators (Pruitt, 1981). This is in contrast to distributive outcomes, where one party benefits at the expense of another without any of the concern for joint benefit that underlies the integrative outcome concept.

Whereas, distributive bargaining (i.e. bargaining with the use of the distributive approach) can escalate hostilities surrounding the current conflict and can poison relationships for future interdependent situations (Fisher and Ury, 1981), integrative bargaining (i.e., bargaining with the use of the integrative approach) is optimal in that it increases joint benefit, the probability of implementation of the reached agreement, and the desire for future interaction (Graham, 1985). It also enhances organizational effectiveness in intra-organizational negotiation settings (Pruitt, 1981).
opposing properties of CMC, de-personalization, and de-individuation need to be explored further. Based on the findings of previous studies on CMC (computer-mediated communication), and from negotiation literature, the following hypotheses are proposed.

Hypotheses about Negotiation Process

The negotiation process refers to the interaction that occurs between negotiators prior to reaching the outcomes. The negotiation process variables this study considered were: conflict management behavior, the accuracy of negotiators’ judgment about the other party’s priorities and negotiation time.

H1: When using computer-mediated communication, negotiators will exchange more "distributive messages" than face-to-face negotiators will.

H2: Negotiators using CMC will perceive their opponents’ priorities less accurately than negotiators using F2F communication.

H3: Negotiators using CMC will take longer to reach agreement than will negotiators using F2F communication.

Hypotheses about Negotiation Outcomes

Negotiation outcomes refer to the attributes of the negotiation agreements. For this study, negotiation outcomes include: joint profit, negotiator’s satisfaction with the communication medium and agreement.

H4: CMC negotiators will achieve lower joint profit than will F2F negotiators.

H5: The level of satisfaction with the communication medium for CMC negotiators will be lower than those for F2F negotiators.

3. Research Methodology

3.1 Participants

Sixty undergraduate students majoring in business participated in this study. Participation in the experiment was voluntary and the subjects were informed that they would be paid based on the payoff points each person earned. The subjects were randomly assigned to groups of size three and each group was randomly assigned to one experimental condition.

3.2 Experimental task

This experiment used a transfer-pricing negotiation task adapted from previous works (Chalos and Ilaka, 1990; Thompson, 1991; Arunachalam, 1991). The negotiation situation involved three managers, two buying division managers and one selling division manager, negotiating transfer prices of four components. There were four issues (components W, X, Y, and Z) with five alternatives (A, B, C, D, and E) for each issue. Within each of the four components, the alternatives represented different combinations of price, quality and timeliness of delivery. Each party had different preferences for the different alternatives defined by the points the manager would receive if that alternative were agreed upon. Of the four issues, three provided different priorities to the three managers and one component had the same priority for all participants. The task presented logrolling potential and provided an opportunity for distributive compromise as well as integrative agreement. Table 1 shows an example of the payoff matrix set used in this study.

There were four negotiation sessions. Each negotiation session had a different set of payoff matrices. The four sets of payoff matrices were similar in that three of the four components provided different priorities to the three managers and one component had the same priority for all managers. The differences between these sets of payoff matrices were that each payoff matrix required negotiators to use a different strategy to derive a fully integrative agreement.

Consider payoff matrix set 1. In this set, each of the managers has one component which generates the largest amount of profit, assuming the appropriate alternative is chosen. The component-alternative conditions that generate the largest payoff for each manager are as follows: for Manager 1, Component W and alternative B; for Manager 2, Component X and alternative D; and for Manager 3, Component Y and alternative C. For Component Z, alternative E is the best choice for all three managers. Also notice that the difference between the best alternatives for the above components and the next best is the highest ($1,200) among all the components. Therefore, to reach the fully integrative agreement, the combination of alternative, B,D,C,E for components W,X,Y,Z respectively need to be chosen by the group.
Table 1: Payoff Matrix Set 1

The presentation of these payoff matrices was counterbalanced. All participants had equal power and were required to come to agreement by unanimity. Agreement entailed choosing one alternative for each of the four issues. Negotiators were also allowed to have an impasse (no agreement).

3.3 Treatments

Negotiators using CMC were physically separated in a university micro computer lab and communicated with each other using computer terminals connected by a local area network. Their discussions were performed using interactive software for on-line, synchronous communication. The program was written in Clipper, a fourth generation language.

The computer screen was divided into three small windows: the payoff window, the outgoing message window and the public message window (see Figure 1). The payoff window displayed the payoff matrix for the negotiator using that terminal. The outgoing message window allowed a manager to type his (her) outgoing messages. This system used a "sequential mode" to send or receive messages. With this mode, after one negotiator had completely finished typing his (her) comments and pressed the enter key, the messages were sent to the others' public message boards. The public message board window displayed all the messages followed by a manager number indicating the source of the message. The users could scroll backwards through the public message board by typing *S. Discussions with the CMC were automatically recorded in a log file along with the time of each remark. Negotiators in FtF communication mode were seated around a table in a regular meeting room. The FtF sessions were videotaped.

3.4 Experimental Procedures

This experiment had two experimental conditions with ten groups in each cell and three managers in each group. Upon arrival at the laboratory, subjects were told that they were going to participate in a simulated negotiation task. All of the participants had been randomly preassigned to one of the two experimental conditions and one of the three manager roles in a group. Each group member was given a four digit experiment ID with material that explained the negotiation task and the payment calculation process. The experiment ID number indicated treatment condition, group number, and manager number. Subjects were told that the last digit of their experiment ID indicated their manager role (i.e., manager 1, 2 or 3). Since the university computer lab had 27 terminals, the members of each group can be physically separated so that they could not determine who their negotiation partners were or see the terminals of the other subjects.
The only means of communication between group members for CMC groups was through a computer terminal and keyboard.

For CMC groups, a 15- to 25 minute training session was conducted at the beginning of the first session of the main experiment. The CMC system was designed so that a user with no experience using E-mail could use it easily. The negotiators were also informed that there would be no time limit for the negotiation and that their payment for participation would be calculated on the basis of the points they accumulated over the four negotiation sessions. Negotiators were also free to remain at an impasse (i.e., no consensus).

After the group members read all the information given, they were given their roles and payoff information for the first negotiation session and began to negotiate. When the group signaled that they had reached a consensus, by typing *end, each manager was given a postsession questionnaire. The postsession questionnaire had questions measuring a negotiator's judgment accuracy regarding the other parties' preferences for the four components. Answering the last question of the postsession questionnaire automatically allowed a negotiator to proceed to the next negotiation session. This process was repeated until all negotiation sessions were completed.

3.5 Measures of Dependent Variables

Conflict management behavior: Conflict management behavior refers to a negotiator's approach toward conflict and negotiation. This takes three general forms defined in section 2: avoidance, distributive, and integrative. To identify conflict management behavior, Sillars' (1987) Interpersonal Conflict Interaction Coding System (ICICS) was used.

Avoidance behavior includes (1) denial and equivocation (denying conflict or making evasive and ambiguous statements), (2) topic management (shifting or terminating a topic in an evasive manner), (3) noncommittal remarks (neither acknowledging, denying, or evading conflict), and (4) irreverent remarks (making light of the conflict in a friendly manner). Distributive behavior is revealed in statements classified as (1) confrontative remarks (statements that are verbally competitive and individualistic, such as insults, criticism, hostile jokes, and demands) or as (2) disagreement. Integrative behavior is revealed in (1) analytic remarks (providing or seeking information about a conflict in a nonconfrontative manner), or (2) conciliatory remarks (expressing supportiveness or a desire for reconciliation, such as compliments or concessions).

Videotaped discussions for FfF groups were first transcribed and then were used for the coding. The log files were used to code the discussions for CMC groups. Using the ICICS coding manual, two independent coders categorized each message exchanged by negotiators in the same group. Then, for each category, the ratio of conflict management behavior was calculated by dividing the number of messages categorized in that particular type of conflict management behavior by the total number of messages exchanged. The two independent coders, who were seniors at the College of Business, coded all groups'
messages and their agreement for coding was as high as .9173.

Judgment accuracy: Judgment accuracy was measured by examining the negotiators' perceived ranking of their opponents' priorities between alternatives in each issue. To score the judgment accuracy for each manager, a 0 or 1 was assigned depending on whether one correctly recognized the other managers' preference for alternatives of each component. Then all three managers' scores over the four negotiation sessions were added for the analysis.

Negotiation time: The length of time it took the group to reach a consensus was used to assess negotiation time for each session. The time recording was started when the group members began to interact with each other and the measurement of time was stopped when the group members reached a consensus.

Joint (total) profit: was measured by summing the payoff points each group member achieved over the four negotiation sessions. This criterion is called the joint-sum criterion (Pruitt, 1981).

Satisfaction: was measured using a questionnaire with a seven-point Likert scale was used.

4. Results and Discussion

All hypotheses were tested via a fixed-effect one-way analysis of variance model. Follow-up analysis was done on the data when the results indicated that such analysis would be beneficial.

As the results presented in Table 2, there were significant associations between communication mode and conflict management behavior. Among the total number of messages the CMC groups exchanged, 10.2% were categorized as distributive while only 5.4% of the total number of messages the FtF groups were categorized as distributive (F1, 18 =7.434, p < .05). In terms of the use of avoidance messages, FtF groups exchanged avoidance messages significantly more than CMC groups (F1,18 = 11.531, p < .01). There was no significant difference between the two groups for the frequency of integrative message used.

Another interesting finding related to conflict management behavior is that FtF negotiators also rated themselves and their opponents as more cooperative than did CMC negotiators. During experiments, FtF negotiators showed concern for the other members' wellbeing (i.e., profit) more than did CMC negotiators. FtF negotiators seemed more satisfied if other group members also earned as much profit as they did. CMC negotiators were less concerned with equality of profit and tried to maximize their own profit. In fact in the post-experiment questionnaire, CMC negotiators indicated that their own payoff points were more important to them than FtF negotiators did. CMC negotiators also rated themselves, as well as other negotiators in the same group, as more competitive than FtF negotiators did. An electronic communication meeting seemed to encourage negotiators to handle their conflict more assertively, whereas a FtF meeting environment provided to negotiators a more cooperative atmosphere in which to deal with their conflicts.

The limitation of expressing negotiators' opinions in writing on the computer screen seemed to encourage the tendency of negotiators to maintain written positions more rigidly than spoken stances. Written text exchanges were the only means of communication and negotiators became frustrated when they did not receive an instantaneous reply to a message they had sent. This feeling of frustration seemed to increase the use of confrontative remarks such as competitive and individualistic comments as well as increasing disagreement.

In support of hypothesis 2, there was a significant communication medium effect indicating that FtF groups judged the other parties' priorities more accurately than CMC groups (F1, 18=4.533, p<.05). The results indicate that electronic communication significantly impedes negotiators' accurate perception of the other parties' priorities. This finding supports empirically the claims made in previous studies; Rich media such as face-to-face meetings are better suited to perform tasks with high ambiguity such as negotiation than are lean media like CMC and audio-conferencing(Hiltz, et al., 1986; McGrath, 1992). Another consistent finding is also found in Arunachalam's experimental study in which he found that computer-mediated communication groups and unstructured groups possessed more inaccurate perceptions than FtF and structured groups respectively (1991). A computer-mediated written form of communication eliminates all the kinds of cues such as facial expression, vocalizations and body movement that are available in a face-to-face communication medium. These missing cues seemed to make CMC an inefficient medium which results in lower judgment accuracy performance. An interesting point is that negotiators who earned lower accuracy scores tended to rank others' priorities in the opposite order of his/her own preferences. This indicates a fixed-pie bias.
### Table 2: Means and Standard Deviations of Dependent Variables

<table>
<thead>
<tr>
<th>Communication Medium</th>
<th>Face to Face</th>
<th>CMC</th>
<th>Grand Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMB (Distributive Messages)</td>
<td>0.054 (0.022)</td>
<td>0.102 (0.040)</td>
<td>0.078</td>
</tr>
<tr>
<td>CMB (Integrative Messages)</td>
<td>0.682 (0.246)</td>
<td>0.652 (0.244)</td>
<td>0.667</td>
</tr>
<tr>
<td>CMB (Avoidance Messages)</td>
<td>0.075 (0.042)</td>
<td>0.067 (0.028)</td>
<td>0.071</td>
</tr>
<tr>
<td>Judgment Accuracy*</td>
<td>15.73 (26.84)</td>
<td>3.86 (9.27)</td>
<td>9.79</td>
</tr>
<tr>
<td>Negotiation time**</td>
<td>12.93 (4.41)</td>
<td>21.55 (7.12)</td>
<td>17.24</td>
</tr>
<tr>
<td>Joint Profit</td>
<td>510,445 (1,533)</td>
<td>499,497 (5,039)</td>
<td>504,971</td>
</tr>
<tr>
<td>Satisfaction with Communication Medium*</td>
<td>17.50 (1.43)</td>
<td>13.60 (3.78)</td>
<td>15.55</td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01

### Table 3: Means for Negotiation Time (in minutes)

<table>
<thead>
<tr>
<th>condition</th>
<th>session 1</th>
<th>session 2</th>
<th>session 3</th>
<th>session 4</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>FtF</td>
<td>17.40</td>
<td>10.80</td>
<td>14.40</td>
<td>9.10</td>
<td>12.93</td>
</tr>
<tr>
<td>CMC</td>
<td>41.20</td>
<td>17.10</td>
<td>13.20</td>
<td>14.70</td>
<td>21.55</td>
</tr>
<tr>
<td>Average</td>
<td>29.3</td>
<td>13.95</td>
<td>13.80</td>
<td>11.9</td>
<td>17.24</td>
</tr>
</tbody>
</table>

As hypothesis 3 predicted, in general, electronic communication negotiators took significantly longer to reach a group consensus than face-to-face negotiators did. Notably, in the first session, groups using CMC took significantly more time than FtF groups did. The negotiation time differences between CMC groups and FtF groups lessened gradually over the four negotiation sessions.

This finding is consistent with the notion of the ineffectivity of electronic communications media and can be explained with William's (1977) proposition. He gave two reasons for the slowness of written media: (1) speaking is faster than writing or typing, and (2) one can engage in other activities (e.g., searching) while speaking, but not while writing or typing. This slowness was more noticeable in the first negotiation session. Negotiation time decreased over the four sessions. This decrease in negotiation time was more prominent between the first two sessions, especially for CMC groups. It indicates a learning effect on the use of the computer-mediated communication system as well as the negotiation task environment involved in this experiment.

As predicted by hypothesis 4, groups using face-to-face communication achieved higher joint profit than CMC negotiators, but not high enough to be significant. A correlation analysis indicates a positive correlation between "judgment accuracy" and "joint profit". This finding confirms Thompson's claim (1991) that negotiators who maintained their fixed-pie perception throughout the negotiation settled for lower profits than did negotiators who made accurate judgments about the other party.

Satisfaction with the communication medium was found to differ between the two communication modes. FtF groups were significantly more satisfied with
their communication medium than were CMC groups ($F_{1,18} = 4.633, p < .05$). Possible reasons for this difference are the communication inefficiency of CMC and the novelty factor of CMC. Although the CMC group members had an exercise session to familiarize them with the CMC, CMC was still a new communication medium compared to the traditional communication medium, FtF. This novelty factor, with the formality of the channel, may have produced more frustration, which resulted in less satisfaction.

5. Conclusion

The major findings from this study can be summarized as follows: Negotiators that communicated through a computer tended to view the negotiation as a win-lose situation, exchanged more distributive messages and took more time to reach a group agreement than negotiators using face-to-face communication. CMC communication groups also achieved lower joint profit and showed less satisfaction with the communication medium and with the group agreement than FtF communication groups did. For the negotiating groups, computer-mediated communication was an inferior communication medium compared to a face-to-face meeting. Therefore, limiting the means of communication solely to computer-mediated communication may result in lower performance of negotiators.

Bui (1993) claimed that an effective NSS should help its users identify their biases and achieve higher joint outcomes. The results of this study suggest that negotiation support tools need to be combined with CMC to effectively offset the negative aspect of computer-mediated communication media.

There are many potential extensions of this research. It would be interesting to examine the impact of different features of CMC design on negotiators' information exchange patterns. Considering different levels of task difficulty or conflict level would be interesting. For example, varying the number of issues and alternatives, using different incentive schemes, and removing the logrolling possibility may generate different levels of conflict and difficulty of the negotiation task. An extension of this work may consider the nature and different levels of complexity or conflict.

One limitation of this research is the low external validity normally associated with laboratory experiments. Another factor related to this experimental setting is that it is difficult to capture group dynamics that are based on a continuous working relationship. The group members were formed just for this experiment. They did not have any past experience as members of the same group or an expectation of being a group member in the near future. In spite of these drawbacks, one of the main reasons this research used a laboratory experiment is due to the exploratory nature of this study. Since there are few research findings to date on the impact of CMC on negotiators' behavior, it was believed that a laboratory experiment that allows researchers to manipulate factors of interests and to make concise inferences about cause-effect would be appropriate. However, because of the issue of artificiality, caution is required in generalizing the findings of this study to different situations. A possible extension related to this matter would be to conduct a field study and compare the research findings.

References


