

## Effects of Inter-subgroup Objective Conflict of Interests on Information Exchange in Group Decision Making

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Groups often comprise subgroups which may have conflicting interests. Sherif and his colleagues (Sherif and Sherif, 1953 ; Sherif et al., 1955, 1961) examined intergroup conflict in three field experiments known as “summer camp studies”, and suggested that group members’ intergroup attitudes tend to reflect objective interests. Competitive, hostile, and prejudiced behaviour was shown by the participants.

Many studies on intergroup conflict have been conducted, in which ingroup bias (e.g., Blake and Mouton, 1962 ; Brown and Williams, 1984) and increased group cohesiveness (e.g., Deutsch, 1949) were reported. Although the intergroup hostile behaviour and ingroup bias in attitudes were found in these studies, the effects of inter-subgroup conflict on information exchange in group decision making have not been examined. Much information is unshared at the start rather than shared among all group members. Information is transmitted from a member to a member, or from a subgroup to a subgroup, and gradually becomes shared in a group for decision making.

How do members transmit information, especially unshared information, with intergroup conflict? Stasser (1985, 92) examined the pooling of unshared information, and suggested that groups tend to talk about shared information which all the members already know rather than exchange unshared information held by a single member.

Regarding information transmission within a group or an organization, many studies have suggested that group members do not always convey information correctly. Some of these studies concern characteristics of information transmission distortion by leaders or followers (e.g., O’Reilly and Roberts, 1974 ; Rosen and Tesser, 1970), and others concern the effects of information transmission distortion (Wayne and Kacmarr, 1991 ; Deluga and Perry, 1994 ; Rao, Schmidt and Murray, 1995 ; Wood and Mitchell, 1981). However little is known about the effects of inter-subgroup conflict on information exchange.

In group decision making, members or subgroups are often brought into conflict with one another, sometimes conflict of thought (Ikeuchi, 1971), sometimes conflict of goals, and sometimes conflict of interests. Fuchigami (1998a, 98b) examined the effects of inter-subgroup conflict of competitive goals on information exchange in group decision making, yielding results that members tend to convey information advantageous to their goal rather than information disadvantageous to their goal rather than disadvantageous information.

This study aims to examine the effects of inter-subgroup conflicts of interests on information exchange between members, on cognition of information, and on perception in group decision making. “A conflict of interest exists when the actions of one person attempting to maximize his or her needs

and benefits prevent, block, interfere with, injure, or somehow make less effective the actions of another person attempting to maximize his or her needs and benefits" (Deutsch, 1973). In this research two subgroups in a group are considered to be negatively interdependent when one subgroup's gain causes another subgroup's loss after a group decision.

### Method

#### Design

In the Interest-Conflict Experiment, the participants were told that one subgroup would gain when the other subgroup lost after a group decision. In the Control Experiment, two subgroups were assigned randomly in a group.

#### Subjects

60 nursing school students participated in this study. Participants were randomly assigned to two Experimental conditions, to roles of leader or follower, to 5-person groups, to 2-person subgroups, and to two alternatives with which their benefits were related. There were six groups in each experiment, but in Control Experiment two groups were excluded from analysis because of the presence of male students or absence from Questionnaire-1 a week before the experiment. Participants were, thus, all female, forming six groups (N = 30) in the Interest-Conflict Experiment and four groups (N = 20) in Control Experiment.

#### Decision Task

For the decision task, we applied the general approach used by Stasser (1985). The participants discussed the hypothetical selection of a subchiefnurse in 5-person groups, each of which consisted of a leader and four followers. Information

about hypothetical candidates (candidate A and candidate B) was given to group members before discussion. This information was composed of shared information given to all members of a group before discussion and unshared information given to only one of the followers of a group. Information about each candidate contained equal numbers of positive, negative and neutral attributes, which were classified by preliminary research (Fuchigami, 1998a). For example, one of the items of positive information was "Candidate A can be cheerful even if she is tired", one of the items of negative information was "Candidate A is perturbed by small things", and one of the items of neutral information was "Candidate A's father is an office worker".

The number of information items about each candidates distributed to group members before discussion is indicated in **Table 1**. Each candidate was given 4 items of positive and negative information and 8 items of neutral information, yielding a total of 16 items of information per candidate, and 32 items across two candidates. 16 items of information were unshared and were distributed among group members. In distributing unshared information among group members, efforts were made to maintain a balance between advantageous and disadvantageous information about each candidate.

#### Preliminary Research

Preliminary research was conducted in 1992 (Fuchigami, 1998a). Descriptions of nurses were taken from textbooks on nursing, and attributes unrelated to nursing were also collected. A questionnaire was prepared which included all these items. An independent sample (all female nurses, N = 80) rated the desirability of each attribute for position of

Table 1  
Number of Items of Information Received by Group Members Before Discussion

	Shared information						Unshared information			
	Candidate A			Candidate B			Candidate A		Candidate B	
	P <sup>a)</sup>	NE <sup>b)</sup>	N <sup>c)</sup>	P	NE	N	P	NE	P	NE
Leader							0	0	0	0
Follower-1							1	1	1	1
Follower-2	2	2	8	2	2	8	1	1	1	1
Follower-3							1	1	1	1
Follower-4							1	1	1	1

a) positive information

b) negative information

c) neutral information

sub-chiefnurse on a 7-point scale from 1 (very undesirable) to 7 (very desirable). On the basis of the ratings, positive attributes were those that were rated, on an average, as desirable attributes of a sub-chiefnurse, negative attributes were rated as undesirable, and neutral attributes were those that were received neutral desirability ratings.

**Instrumentation**

**Cognition of Information**

On cognition of information, participants were asked to rate the desirability of each shared attributes about candidates for the position of sub-chiefnurse on a 7-point scale from 1 (very undesirable) to 7 (very desirable) in Questionnaire-1, which participants filled out four times for careful analysis of a process, firstly a week before the experiment, and then after instruction (Phase 1), after subgroup discussion (Phase 2), and after group discussion (Phase 3) (Figure 1). Participants were asked to complete Questionnaire-1 according to how they felt at that moment. The answers without instruction or interaction a week before the experiment were used as a standard.

Inter-subgroup and Within-subgroup Relationship Participants were asked to rate their agreement on inter-subgroup relationships with the following harmony-conflict dimension (Brown et al., 1986) and index of hostility, using a 7-point scale from 1 (don't feel at all) to 7 (feel very much) : "I feel that the two subgroups in my group are against each other" "I feel that the two subgroups in my group are working together" "I feel hostility towards the other subgroup". In within-subgroup relationships, emotional-cohesion, task-oriented cohesion (Bernthal and Insko, 1993), and solidarity were rated with the following statements using a 7-point scale : "I feel that the member in my subgroup is likable" "I feel that my subgroup has good problem-solving skills" "I feel my subgroup solid". These six questions were

answered by participants three times, after instruction (Questionnaire-2, Phase 1), after the 2-person subgroup discussion (Questionnaire-3, Phase 2), and after the 5-person group discussion (Questionnaire-4, Phase 3), for careful analysis of the inter-subgroup and within-subgroup relationship in each experiment.

**Perception**

After the group discussion (decision making) in Questionnaire-4, participants rated perception : for example perception of discussion, perception of belonging to subgroup and group, perception of leader, and perception of in-subgroup bias, using a 7-point scale.

**Other Questions**

In Questionnaire-2, participants completed a free recall task of unshared information by listing as much information as they could about each candidate, and a free description task about what sort of person each candidate was. These data were excluded from analysis. In Questionnaire-3 participants again completed a free description task about what sort of person each candidate was. These data were also excluded from analysis. In Questionnaire-4 participants answered which candidate they wished to be selected, which candidate they thought suitable for the position (preference), and on their aims in group discussion, where participants again completed free description tasks about what sort of person each candidate was, and the leaders were asked to describe meaning of group decision. These data were excluded from analysis.

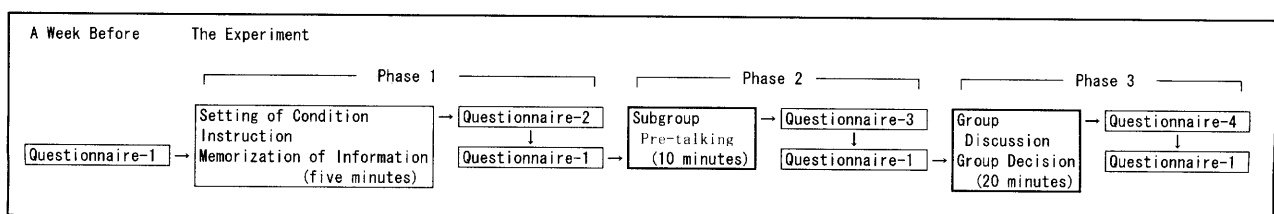
**Procedure**

The Procedure is indicated in Figure 1.

**Phase 1**

Preliminary instructions stated that the research was concerned with group work as a part of a social psychology class. Participants read individual descriptions of instructions. including general

Figure 1  
Procedure



instructions. The instructions varied according to the experiment, and information items of two candidates varied individually. The general instructions in both experiments were, "Discuss the selection of sub-chief nurse from candidate A and candidate B in 5-person groups for 20 minutes and make group decision on which candidacy is better suited for the position, after 2-person subgroup discussion for ten minutes. the leader (the chairman) will make the decision if you cannot reach unanimous agreement". After the general instruction, instructions for the Interest-Conflict Experiment stated, "For this research some candies have been prepared. You and (1) will win some candies if candidate A (or B) is selected. If candidate B (or A) is selected, (2) and (3) will win the candies (1, 2, and 3 are names of participants)". The Control Experiment instruction was simply to discuss ordinarily. Participants in the Interest-Conflict Experiment were to allocated to see the candies.

Following the instruction, participants were given five minutes for memorization of information. After the withdrawal of the instructions and information about candidates, participants completed Questionnaire-2, and filled out Questionnaire-1. The participants' answers after are shown as "Phase 1" in Tables and Figures.

### **Phase 2**

Participants who were assigned the role of follower were instructed to discuss anything they liked in 2-person subgroups for ten minutes, while the leaders stood by in another classroom. In the Interest-Conflict Experiment, the followers in a subgroup shared interests, that is, interdependence of fate (Rabbie and Horwitz, 1969) to win or lose candies. The pre-talking in each subgroups were tape-recorded. After followers' pre-talking, participants completed Questionnaire-3, and next Questionnaire-1 again. These answers by participants after pre-talking are indicated as "Phase 3" in Tables and Figures.

### **Phase 3**

5-person groups met in near rooms to discuss the candidates for 20 minutes and to make group decision. The discussion of each group were tape recorded for analysis. After group decision making, participants completed Questionnaire-4, and next Questionnaire-1 again. These answers by par-

ticipants after group discussion and group decision making are indicated as "Phase 4" in Tables and Figures.

### **After the Experiment**

The participants were given an outline of the experiment and all participants. They were given brief cooperative task for removal of antagonistic feeling among participants.

## **Results**

### **Bias in Transmission of Information in 5-person Group Discussion**

Using audio recordings, the participants' utterances were written down, and the information was analyzed. In each experiment, unshared information that followers received before the discussion was of four kinds as follows (Positive unshared information of candidate A, Negative unshared information of candidate A, Positive unshared information of candidate B, Negative unshared information of candidate B: See Table 1).

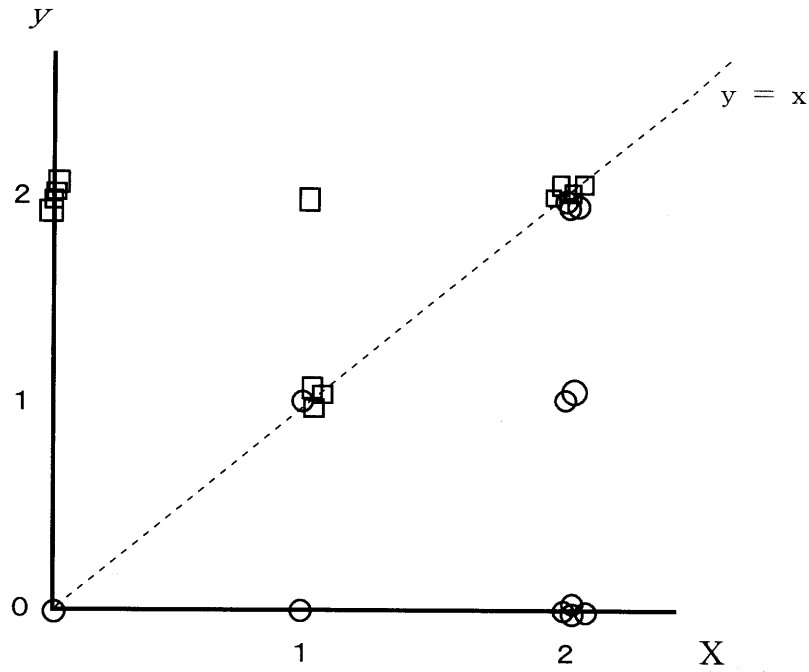
An attempt was made to divide these into information advantageous to candidate A and information advantageous to candidate B, as follows :

$$\begin{aligned} & \left( \begin{array}{l} \text{Advantageous unshared information to A} \\ \text{Advantageous unshared information to B} \end{array} \right) \\ = & \left( \begin{array}{l} \text{Positive unshared information of A + Negative unshared information of B} \\ \text{Positive unshared information of B + Negative unshared information of A} \end{array} \right) \\ = & \left( \begin{array}{l} \text{Disadvantageous unshared information to B} \\ \text{Disadvantageous unshared information to A} \end{array} \right) \end{aligned}$$

Unshared information which followers conveyed in group discussions was plotted on a graph, with information advantageous to candidate A on the horizontal ( $x$ ) axis and information advantageous to candidate B on the vertical ( $y$ ) axis,

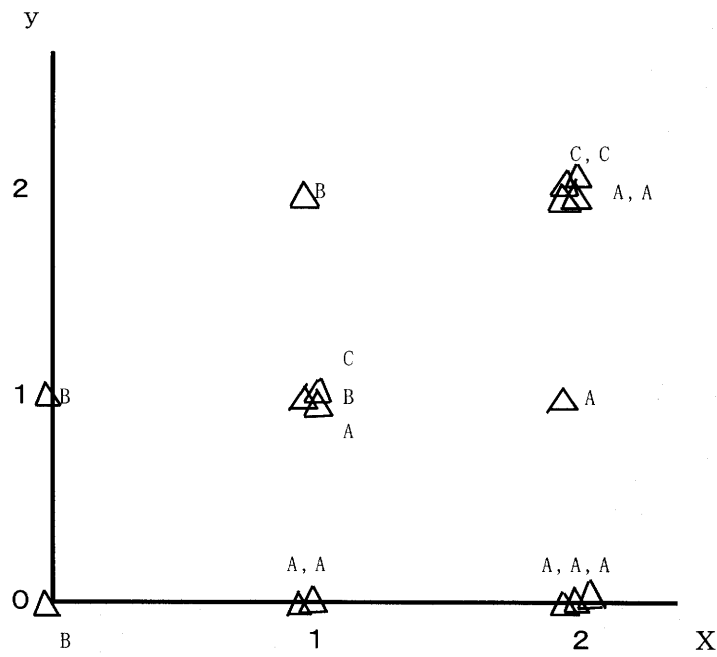
$$= \left( \begin{array}{l} x \\ y \end{array} \right).$$

Figure 2 shows the number of mentions of unshared information by followers in the Interest-Conflict Experiment, and Figure 3 shows Control Experiment. The number of information items given to followers before discussion is  $(x, y) = (2, 2)$  (See Table 1), which is taken as the maximum in each experiment. To compare in detail the transmission of unshared information in the Interest-Conflict Experiment, four kinds of unshared information conveyed by followers were analyzed.



X : Advantageous to Candidate A (Disadvantageous to Candidate B)  
 Y : Advantageous to Candidate B (Disadvantageous to Candidate A)  
 ○ Followers who gain candies when candidate A is selected  
 □ Followers who gain candies when candidate B is selected

Figure 2 Distribution of Unshared Information Conveyed by Followers in Group Discussion in the Interest-Conflict Experiment



X : Advantageous to Candidate A (Disadvantageous to Candidate B)  
 Y : Advantageous to Candidate B (Disadvantageous to Candidate A)  
 A···· Followers who answered that candidate A is suitable for the position.  
 B···· Followers who answered that candidate B is suitable for the position.  
 C···· Followers who answered that I can say neither

Figure 3 Distribution of Unshared Information Conveyed by Followers in Group Discussion in Control Experiment

Figure 4 shows that participants who would gain candies if candidate A was selected conveyed more (1)positive unshared information of candidate A and (2)negative unshared information of candidate B, than (3)negative unshared information of candidate A and (4)positive unshared information of candidate B ( $F(3/44) = 4.22, p < .05; 1 > 3, p < .05; 1 > 4, p < .01; 2 > 3, p < .05; 2 > 4, p < .01$ ), but on the other hand that participants who would gain candies if candidate B was selected were the reverse ( $F(3/44) = 4.04, p < .05; 3 > 1, p < .05; 3 > 2, p < .01$ ). The assumed

maximum of bars in Figure 4 is 1 (See Table 1).

Following the analysis of unshared information, Figure 5 shows the total number of mentions of information items, shared or unshared by followers in group discussion in the Interest-Conflict Experiment. Participants who gained candies if candidate A was selected mentioned more information advantageous to A than to B ( $t(11) = 4.25, p < .005$ ), on the other hand participants who gained candies if candidate B was selected mentioned more information advantageous to B than to A ( $t(11) = 3.31, p < .005$ ).

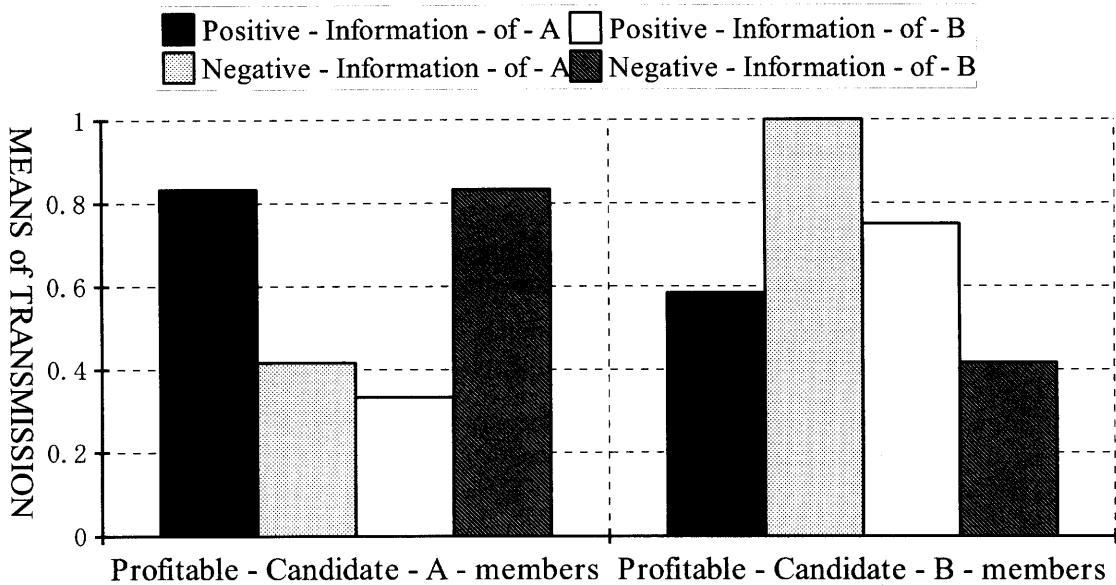


Figure 4 Means of Quantity of Unshared Information Conveyed by Followers in Group Discussion in Interest-Conflict Condition

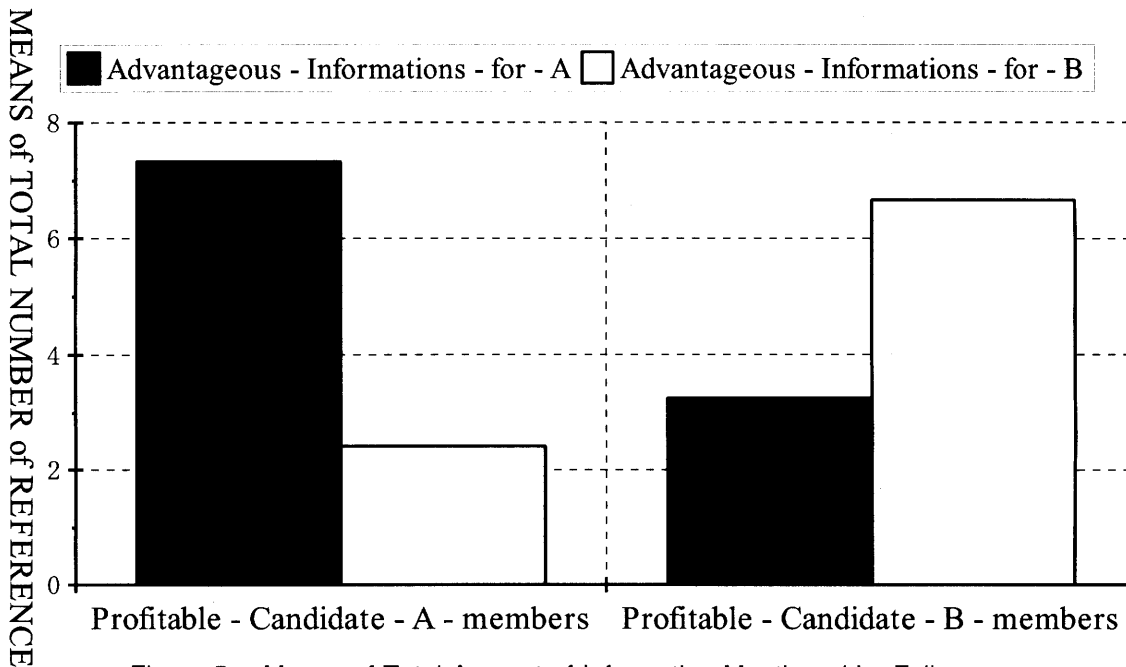


Figure 5 Means of Total Amount of Information Mentioned by Followers in Group Discussion in Interest-Conflict Condition

Interpretation of Neutral Information in Interest-Conflict Experiment

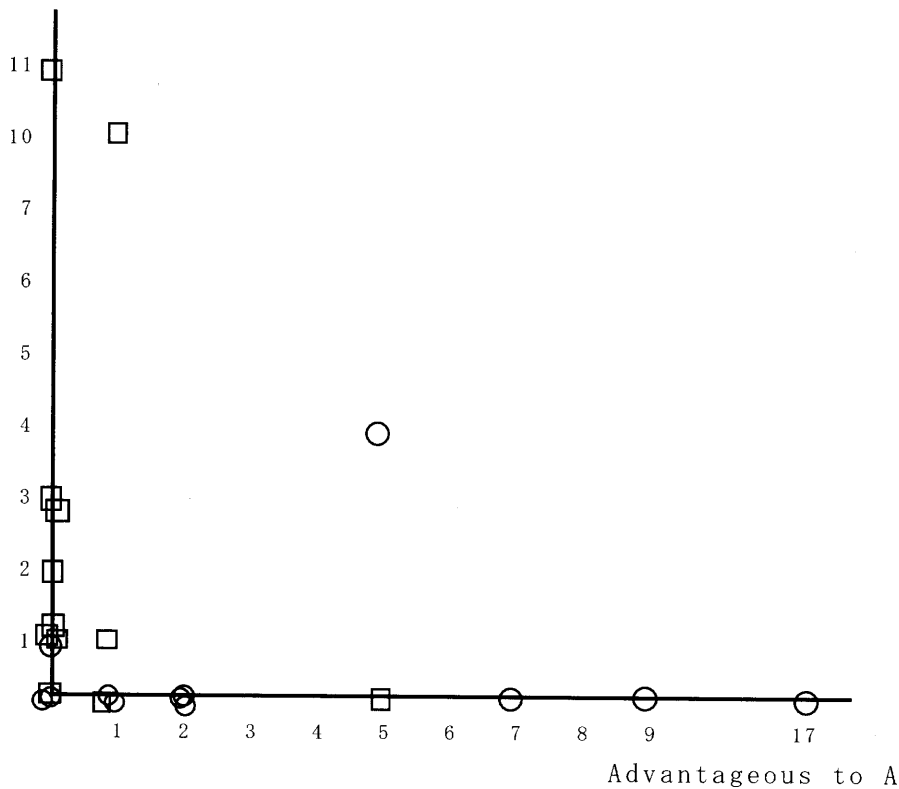
Participants in the Interest-Conflict Experiment interpreted neutral information items of alternatives to their advantage, as in Figure 6, with the number of interpretation advantageous to candidate A on the *x* axis and the number of interpretations advantageous to candidate B on the *y* axis.

$$\begin{aligned}
 & \left( \begin{array}{l} \text{Interpretation advantageous to A} \\ \text{Interpretation advantageous to B} \end{array} \right) \\
 = & \left[ \begin{array}{l} \text{Interpretation of neutral information of A positively+} \\ \text{Interpretation of neutral information of B positively} \\ \text{Interpretation of neutral information of A positively+} \\ \text{Interpretation of neutral information of B positively} \end{array} \right] \\
 = & \left[ \begin{array}{l} \text{Interpretation disadvantageous to B} \\ \text{Interpretation disadvantageous to A} \end{array} \right] \\
 = & \begin{pmatrix} x \\ y \end{pmatrix}.
 \end{aligned}$$

An example of as interpretation of neutral information item positively is, "B has started playing tennis recently, - she has a desire to improve herself." (the underlined part is neutral information given to members before discussion), and an example of interpretation of neutral information item negatively is, "B is on a diet -there must have been something wrong with way of life".

**Cognitive Bias of Information in Interest-Conflict Experiment**

Table 2 shows averaged evaluation of 8 neutral information items, 2 positive information items and 2 negative items of each alternative in the Interest-Conflict Experiment. Followers rated the information about candidates related to their acquisition of candies connected more desirable than information about candidates unrelated to the candies, in other words the candidates with whom the other subgroup members' acquisition of candies was connected, on Phase 2 ( $t(23) = 2.47, p < .025$ ) and on Phase 3 ( $t(23) = 2.66, p < .01$ ), on the other hand the effect was not significant a week before the experiment ( $t(23) = 0.54, n.s.$ ) and in Phase 1 ( $t(23) = 0.81, n.s.$ ).



○Participants who gain candies when candidate A is selected  
 □Participants who gain candies when candidate B is selected

Figure 6 Number of Interpretation of Neutral Information in the Interest-Conflict Experiment

A similar tendency appeared with regard to positive information and negative information. The effect, on positive information, was significant in Phase 2 ( $t(23) = 1.74, p < .05$ ), but not significant a week before ( $t(23) = 0.24, n.s.$ ), in Phase 1 ( $t(23) = 0.77, n.s.$ ), or in Phase 3 ( $t(23) = 0.85, n.s.$ ). concerning negative information, the effect was significant in Phase 2 ( $t(23) = 2.14, p < .025$ ) and Phase 3 ( $t(23) = 1.81, p < .05$ ), but not significant a week before ( $t(23) = 0.33, n.s.$ ) and or in Phase 1 ( $t(23) = 0.95, n.s.$ ).

### ***Inter-subgroup and Within-subgroup Relationship***

**Table 3** shows the results of the analyses. Concerning inter-subgroup relationships, participants in the Interest-Conflict Experiment evaluated more conflicting, less cooperative, and more hostile than those in the Control Experiment throughout the experiment. Concerning within-subgroup cohesion and solidarity, the effect was no significant.

Table 2  
Means of Ratings of Information Items by Followers in the Interest-Conflict Experiment

	A Week Before	Phase 1	Phase 2	Phase 3
<b>Neutral Information</b>				
of Profitable Candidates	4.28	4.29	4.38	4.31
of Profitless Candidates	4.33	4.23	4.19	4.13
<b>Positive Information</b>				
of Profitable Candidates	6.63	6.60	6.60	6.58
of Profitless Candidates	6.60	6.54	6.42	6.42
<b>Negative Information</b>				
of Profitable Candidates	2.17	2.63	2.90	2.73
of Profitless Candidates	2.13	2.50	2.48	2.48

df=23, \*  $p < .05$ , \*\*  $p < .025$ , \*\*\*  $p < .01$

Table 3  
Perceptive Inter-subgroup and Within-subgroup Relationship

	Phase 1	Phase 2	Phase 3
<b>Inter-subgroup relationship</b>			
<b>Conflict index</b>			
The Interest-Conflict Experiment	4.04	4.33	4.33
Control Experiment	2.31	2.44	2.81
<b>Cooperation index</b>			
The Interest-Conflict Experiment	4.29	4.58	4.75
Control Experiment	5.44	5.00	5.56
<b>Hostility index</b>			
The Interest-Conflict Experiment	3.08	3.50	3.38
Control Experiment	1.88	1.88	1.88
<b>Within-subgroup relationship</b>			
<b>Emotional cohesion index</b>			
The Interest-Conflict Experiment	5.38	5.67	5.75
Control Experiment	5.63	5.69	5.88
<b>Task-oriented cohesion index</b>			
The Interest-Conflict Experiment	4.92	5.00	5.25
Control Experiment	4.81	5.06	5.31
<b>Solidarity index</b>			
The Interest-Conflict Experiment	5.17	5.50	5.42
Control Experiment	5.38	5.50	5.75

\*  $p < .01$ , \*\*  $p < .025$ , \*\*\*  $p < .005$ , \*\*\*\*  $p < .0005$



***In-subgroup perceptive bias***

Participants rated feelings towards members of their subgroup (in-subgroup members) and to members of other subgroups (out-subgroup members) with five indexes using a 7-point scale after group discussion. Feelings towards in-subgroup members and out-subgroup members were compared. **Table 4** showed the results. In the Interest-Conflict Experiment, the effect was significant in three indexes, i.e. participants felt in-subgroup members more likable and less malicious than out-subgroup members, and felt like discussing with in-subgroup members than with out-subgroup members on another occasion.

***Perception between Experiments***

Participants rated their agreement with questions using the 7-point scale in Questionnaire-4 after group discussion and group decision making. The result of comparison between experiments suggests that participants in the Interest-Conflict experiment felt less satisfaction with the discussion and decisions than those in the Control Experiment, and felt more belonging to their subgroup than to their group. The effect on their attitude towards their leaders also was significant. Concerning the discussion, the effect of experiment was significant in four indexes as follows : “I feel satisfied with the group discussion” (4.92, 5.75,  $t(38) = 1.92, p < .05$ ), “I feel satisfied with the group decision” (4.75, 5.88,  $t(38) = 2.40, p < .01$ ), “I feel that time was not enough for the group decision making” (3.00, 3.88,  $t(38) = 1.97, p < .05$ ), “I feel that the discussion was including conflict” (4.38, 3.38,  $t(38) = 1.94, p < .05$ ).

Feelings about subgroups and groups were as follows : “I feel that I belong to the subgroup” (5.29, 4.19,  $t(38) = 2.94, p < .005$ ), “I feel that I belong to the group” (4.33, 4.56,  $t(38) = 0.54, n.s.$ ).

Feelings towards leaders were as follows : “I feel that the leader was impartial” (5.27, 6.20,  $t(35) = 2.26, p < .025$ ), “I feel the leader was considerate of harmony group” (5.32, 6.07,  $t(35) = 2.15, p < .025$ ).

***Gaining and Losing Subgroup in Interest-Conflict experiment***

All of the 5-person groups were instructed to make decisions to select a sub-chiefnurse from candidate A and candidate B. In the Interest-Conflict Experiment, half of the subgroups gained and the other half lost, that is, half of participants gained and the other half lost. The ratings were compared on Likert scales in Questionnaire-4 between gaining participants and losing participants. The result was as follows : “I feel satisfied with the group decision” (5.25, 4.25,  $t(22) = 1.45, p < .10$ ).

***Group Decisions***

Four groups selected candidate A, and two groups selected candidate B in the Interest-Conflict Experiment. In the Control Experiment, three groups selected candidate A and one group selected candidate B.

***Discussion***

This research examined inter-subgroup conflict. The results of this research suggest that inter-subgroup conflict of interests produces an effect on group members’ transmission of information, on interpretation of information, on cognition of information, on hostility, on in-subgroup perceptive bias, and on the perception of discussion, belonging and leadership. On the other hand, the effects on cohesion within the subgroup, and on the perception of gaining and losing members were not clear.

***Bias in Informartion Exchange***

In Interest-Conflict Experiment, the bias in the trasmission of information is shown in **Figure 2**,

Table 4  
In-subgroup Perceptive Bias in the Interest-Conflict Experiment

	towards in-subgroup members	towards out-subgroup members
'I feel satisfied with the member(s)'	5.67	5.58
'I feel that the member(s) is(are) likable'	5.79	5.42 *
'I feel that the member(s) was(were) selfish in the discussion'	4.21	4.04
'I feel that the member(s) was(were) malicious in the discussion'	2.00	2.54 *
'I feel like discussing with the same member(s) on another occasion'	5.33	4.92 **

df=23, \*  $p < .05$ , \*\*  $p < .025$

**Figure 4**, and **Figure 5**. In **Figure 2**, the dots of participants who gained candies if candidate A was selected tend towards the  $x$  axis, on the other hand the dots of participants who gained candies if candidate B was selected tend towards the  $y$  axis. No participants conveyed more disadvantageous information than advantageous information. In particular participants of  $(x, y) = (2, 0)$  and  $(x, y) = (0, 2)$  conveyed all advantageous unshared information concerning their acquisition of candies but conveyed no disadvantageous information. Thus in the Interest-Conflict Experiment, participants transmitted advantageous information concerning their acquisition of benefits more than disadvantageous information, or information concerning other subgroup members' acquisition of benefits. This can be also confirmed by the T-test as in **Figure 4**, and more clearly by analysis of the total amount of mentioning of information in **Figure 5**.

In a group, information conveyed by a subgroup compensated for lack of information conveyed by the other subgroups as indicated in **Figure 4** and **Figure 5**, in other words transmission of information by each subgroup was partial, but balanced in a group. Imagine a group in which all four followers gain when candidate A is selected or lose when candidate B is selected. They may select information and convey, and the leader may not be able to receive sufficient information for decision making.

In the Control Experiment, i.e. the ordinary discussion, the transmission of information appears to be scattered and there are many well-balanced dots, see **Figure 3** and Fuchigami (1998a, 98c). Some of the participants in the Control Experiment conveyed unshared information in a less-balanced way, the dots were partially related to their thoughts on which candidate was suitable for the position, as in **Figure 3**. This result accords with Stasser (1985), which suggests discussion tends to be dominated by information that supports members' existent preferences.

As for the quantity of unshared information conveyed by participants in group discussion, followers in the Interest-Conflict Experiment transmitted 2.6 items of unshared information out of 4 items (See **Table 1**) per person on average, and in the control Experiment followers transmitted 2.3 items out of 4 items. Regarding the quantity of unshared informa-

tion pooled in a group, 10.7 items of unshared information out of 16 items (See **Table 1**) per group on average were pooled in the Interest-Conflict Experiment, and 9.8 items out of 16 items were pooled in Control experiment. The disagreement between averages per person and per group was caused by the 2-person subgroup discussion before the group discussion. Thus the leaders, had to make decisions with a lack of five or six items of information on an average.

The tendency to select and convey more advantageous information than disadvantageous information in the Interest-Conflict Experiment bore a close resemblance to Fuchigami (1998a, 98b), in which participants were instructed to have goals that candidate A or candidate B would be selected. In this research, did participants in the Interest-Conflict Experiment have goals that candidate A or candidate B would be selected? They did not necessarily. According to the answers by participants in Questionnaire-4, four followers wanted candidate A to be selected, three participants wanted candidate B to be selected, ten followers wanted proper decision, and seven followers aimed to reach unanimous agreement in the Interest-Conflict Experiment. The tendency to select information and convey with inter-subgroup conflict of interests did not necessarily occur by means of intermediation of inter-subgroup conflict of goals. It is interesting that participants who aimed at a proper decision and those who aimed at reaching unanimous agreement selected more information and conveyed more in discussion.

#### ***Interpretation of Neutral Information***

In the Interest-Conflict Experiment, the bias in interpretation of neutral information is shown in **Figure 6**, in which the dots of participants who were to gain candies if candidate A was selected are partial towards the  $x$  axis, and the dots of participants who were to gain candies if candidate B was selected are partial towards the  $y$  axis. Participants in the Interest-Conflict Experiment directed discussion with the intention that candidate A or candidate B was selected by means of conveying advantageous information than disadvantageous information and interpreting information to their advantage, as if they had a tug of war. Interpretation of positive and negative information was excluded from analysis.

### **Cognitive Bias of Information**

Participants in the Interest-Conflict Experiment rated the alternatives which were related with their benefits more positively than the other alternatives, which were conversely related to subgroup members' benefits. They rated neutral, positive and negative information of the candidates who were related to candies more desirable than the other candidates mainly in Phase 2 and Phase 3. This suggests a cognitive bias of information occurs in inter-subgroup objective conflict of interests in group discussion. Subgroup discussion may be the most important phase for cognitive bias of information. The bias of information of each participant appeared clearly, as indicated in **Figure 6**, **Figure 7**, and **Figure 8**. Although the effect was not significant in Phase 1 (after instruction), it is possible that participants had potential biases in the phase, that is, participants had potential biases when they were instructed on the relationship between their interests and the alternatives, which potential biases appeared clearly in subgroup discussion phase.

One of grounds of the effect of subgroup discussion is that within-subgroup members have common interests in this experiment. How would the cognitive bias of information be, if subgroup members had no common interests? We should pay attention to the fact that participants in this experiment listened to opposing information and opposing thoughts in the 5-person group discussions and the effect was also significant in Phase 3. It might be important to interact with someone rather than to interact with one who has common interests.

### **Perception**

Regarding inter-subgroup relationship, participants who were in the Interest-Conflict Experiment were evaluated as more conflicting, less cooperative, and more hostile than who were in Control Experiment throughout the experiment. They felt the relationship between two subgroups conflicting and hostile without interaction with someone, only with instruction, and the hostility was not decreased with inter-subgroup discussion.

Concerning within-subgroup relationships, increased cohesiveness was not obtained in this research, because the experiment was short and transient, and participants were not strangers but classmates. Regarding the in-subgroup perceptive bias, the effect was significant. It suggests ingroup

bias obtained in previous researches applies to the case of group discussion.

As for comparison of perception between experiments, it is notable that in the Interest-Conflict Experiment, participants felt they belonged to subgroups rather than groups, so the groups was virtually split into two subgroups. Between gaining and losing participants, the effects were not clear. It had been hypothesized that gaining participants evaluate discussion and leader more positive than losing participants, but the only significant effect was on satisfaction with group decision. It is anticipated that greater significance will be obtained if the motive of acquisition of benefits are stronger.

### **Limitation**

First, this research aimed mainly to examine the effect of inter-subgroup conflict on information exchange, and did not aim to examine the effect of information exchange on group decision. Second, each alternative was equally desirable, and no correct outcome was envisaged. Finally, the distribution of unshared information to followers before discussion was balanced for examination of lean of information transmission.

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