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Personal Involvement,Task Complexity, and the Decision Making Process: An Information Search Analysis

by

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Abstract

The purpose of this study was to examine the influence of personal involvement and task complexity on the decision making process. Seventy-four female university students were randomly assigned to one cell of a 2 (personal involvement: low or high) x 3 (task comlexity: 2, 6, or 10 alternatives) design. The main results were as follows. (1) The subjects spent a greater amount of time reaching decisions in which they had greater involvement. (2) The subjects inquired about a greater amount of information during the decision task in which they had greater involvement. (3) The subjects more often returned to the information that they had already inquired about during the decision task in which they had greater involvement. (4) An interaction effect between involvement and task complexity was observed. That is, the effect of involvement on decision making process was largest when task comp lexity was moderate.

Key words: personal involvement, task complexity, decision making, choice process, information search, decision strategies.

Investigating psychological factors influencing decision making process is one of the main problems in the research on human decision making. Despite growing evidence that personal involvement can play an important role in the way people interpret and evaluate social information(Borgida & Howard-Pitney, 1983; Chaiken, 1980; Harkness, DeBono, & Borgida, 1985; Petty & Cacioppo, 1990; Cacioppo, & Goldman, 1981), little work has been done on the effect of personal involvement on individual decision making. This study assessed the influence of personal involvement on the decision making process on the decision tasks where the task complexities were varied.

Recent work on social cognition suggests that involved subjects pay more attention to the content of information presented, process this information more systematically, and are less likely to rely solely on simple heuristics(Borgida & Howard-Pitney, 1983; Chaiken, 1980; Harkness et al., 1985; Petty & Cacioppo, 1990; Cacioppo, & Goldman, 1981). However, no previous research has demonstrated this link between involvement and the decision making process. For example, although Harkness et al. (1985) identified the judgmental strategies by using covariation judgment tasks, they did not trace the decision making process. In contrast, the present study used a process tracing technique which should provide valuable insights into the decision making process which led a subject to exhibit a particular choice.

The process tracing technique involves presenting subjects with decision tasks where they have to inquire about information about the alternatives available. Examination of the information search pattern should provide a method for discriminating between alternative models of decision making in terms of the information processing behavior assumed to underlie the various models of decision strategies (Payne, 1976; Payne, Braunstein ,& Carroll, 1978; Takemura & Takagi,1985,1987).

The studies using the process tracing technique showed that people used a variety of decision strategies for making choices and the selection of these strategies was largely contingent on task complexity (Abelson & Levi, 1985; Olshavsky, 1979; Payne, 1976, 1982; Payne & Braunstein, 1978; Takemura, 1988, 1993) . In most cases, the task complexity has been manipulated through variations in the number of alternatives in the choice set. Previous studies indicate that decision strategies were sensitive to the number of alternatives, and that information acquisition patterns of the strategies became more attribute based as the number of alternatives (degree of task complexity) increased (Payne, 1976; Payne & Braunstein,1978; Takemura,1993).

As Branscome and Cohen (1991) suggested, task complexity would be an important condition influencing involvement effects on decision making. That is, the interaction effect between involvement and task complexity would be expected. Thus, the present study was also designed to examine the joint effects of involvement and task complexity which was manipulated by three variations in the number of alternatives (two, six, and ten alternative conditions).

In the present study, "outcome dependency" which was provided by Berscheid, Graziano, Monson, & Dermer(1976) was utilized as the way of manipulating the degree of involvement in the decision task. In the high-involvement condition, before the decision task, each subject was asked to meet the person whom she chose as a dating partner. On the other hand, in the low-involvement condition, each subject was not asked to meet the person. This manipulation would be expected to control some perceived degree of psychological control over their outcomes (e.g., the amount of fun, the level of boredom, degree to which they feel defensive, and the sexual opportunities). As a result, meeting-condition subjects should experience greater involvement than should non-meeting-condition subjects.

On the basis of the two major conditions, the following hypotheses were proposed:

1. Subjects in the high-involvement condition should spend a greater amount of time during the decision task than subjects in the low-involvement condition.

2. Subjects should inquire about a greater amount of information and the ratio of inquired information to the total available information should be higher during the decision task in which they have greater involvement.

3. Subjects should more likely to return information they had already inquired about in which they have greater involvement.

4. Subjects in the high-involvement condition should more often use an alternative-wise information search than subjects in the low-involvement condition. On the other hand, subjects in the low-involvement condition should more likely use an

attribute-wise information search than subjects in the high-involvement condition.

5. An interaction effect between involvement and task complexity should be observed. That is, the effect of involvement should be largest when the degree of task complexity is adequate for processing information. In the present study, the six-alternative condition should create the largest effect of involvement, because six is the closest number of the Magical Number Seven (Miller, 1956), which indicates the maximum capacity of human information processing.

Method

Design

A 2 x 3 experimental design was used. Our experiment involved two major involvement conditions: meeting condition (high-involvement condition) and non-meeting condition (low-involvement condition). These two major conditions were crossed with three conditions of task complexity: a two-alternative condition, a six-alternative condition, and a ten alternative condition.

Subjects

Seventy-four female Doshisha University undergraduates who enrolled in the introductory psychology course participated in the experiment. They were recruited on a voluntary basis and were given extra course credit for their participation. These subjects were randomly assigned to one of the six conditions that we created by crossing the two involvement conditions with the three conditions of task complexity (number of alternatives).

Stimuli

A decision task for a subject involved a number of alternatives, either two, six, and ten. The stimuli were information matrices representing different potential dating partners. Each row of the matrix represented one attribute of potential dating partners, and each column was labeled with a letter representing a person (e.g., Person A). One example of the material used in this study is shown in Figure 1. Each cell of the matrix represents the actual informational value for the person(alternative)-attribute combination and was labeled with a letter and a numeral. For example, "A2" represents "height of person A". Figure 1

Attributes were chosen on the basis of an exploratory study involving 98 undergraduates. The ten attributes most frequently listed as important in selecting a dating partner were used in the present study. These were (1) facial attractiveness, (2) height, (3) body form, (4) sympathy, (5) cheerfulness, (6) decisive character, (7) firm attitude, (8) punctuality, (9) hobby, and (10) possibility of acceptance. With the exception of "hobby", there were five values for each attribute : well above average, above average, average, below average, well below average. For the hobby attribute, the following categories were used : Plays musical instruments, plays sports, studies, and does nothing. The values of the alternatives of the various attributes were chosen such that no alternative would completely dominate the other remaining attributes. The values of each attribute were selected so that each alternative would have both good and poor qualities, a priori.

Procedure

Each subject was run individually through an experimental session. The subjects were told that they would be presented with a number of alternatives to choose from and a certain amount of information about each alternative. They were told that each alternative represented a potential dating partner and that they should choose the person they would prefer as a dating partner for themselves on the basis of the information provided about each person.

In the high-involvement condition, the subjects were given these instructions:" This is a dating study. If you agree to participate, you will meet, at least one time, the person from our dating pool that you have chosen during the experiment. Our interest is in how judgments change, how our feelings change about people from the time we first hear about a person to the time when we actually meet the person. That is the basic idea behind this study. If you agree, please sign the consent form." As a result, all the subjects in this condition signed it. On the other hand, in the low-involvement condition, the subjects were not asked to meet the person they chose during the experiment.

Subjects were instructed to ask the experimenter one piece of information at a time. They were told they were free to ask as little or as much information as they wanted to or felt was necessary to make the decision. No time constraints were placed on the subject. They were instructed to work at their own pace and that they should have plenty of time to finish. Responding

to the subjects' request for information, the experimenter sequentially gave each subject information about each value of the cell from a part of the experiment room, which was screened off from subject's view by a screen. Sessions were timed and tape-recorded.

Debriefing

Because of the deceptive nature of the involvement manipulation, an extensive and carefully designed debriefing session concluded the procedure. Care was taken to create a friendly and informal atmosphere in which the aims and rationale for the study were fully explained. All subjects understood and accepted the rationale of the procedure, and we found no evidence of any residual negative effects.

Analysis

All analyses of variance reported below were performed using a 2 x 3 design with 12 subjects per cell. The independent variables were: two levels of involvement (low and high levels), the number of alternatives (two, six, and ten). In all analyses, the two factors were treated as between-group factors. In order to meet the formal requirements for the analyses of variances, raw proportions were subjected to an arcsine transformation.

Results and Discussion

Decision time

Figure 2 presents the mean time required to make the decision for each condition. A two-way analysis of variance (that is, involvement and number of alternatives) was conducted. The main effect of involvement was highly significant, $F(1,66)=13.31$, $p<.001$. As predicted in Hypothesis 1, subjects in the high-involvement condition spent a greater amount of time at the decision task than subjects in the low-involvement condition. Furthermore, the main effect of the number of alternatives was highly significant, $F(2,66)= 9.48$, $p<.001$. The multiple comparison test for differences between the number of alternatives revealed that subjects in the six and ten alternative conditions spent a greater amount of time during the decision task than subjects in the two-alternative condition. Although all the main effects were significant, the interaction was not significant.

Figure 2

Amount of information searched

The search data for each subject was primarily organized in terms of the amount of available information inquired about. Figure 3 presents the mean pieces of information examined in the decision making process for each condition. A two-way analysis of variance was conducted. The main effect of involvement was significant, $F(1,66)=6.85$, $p<.05$. As predicted in hypothesis 2, subjects in the high-involvement condition inquired about a

Figure 3

greater amount of information during the decision task than subjects in the low-involvement condition. Furthermore, the main effect of the number of alternatives was highly significant, $F(2,66)= 14.84$, $p<.001$. The multiple comparison test for differences between the number of alternatives revealed that subjects in the six and ten alternative conditions inquired about a greater amount of information during the decision task than subjects in the two-alternative condition. In addition, the interaction was marginally significant, $F(2.66)= 2.98$, $p<.06$. The interaction implied that involvement had a strong effect on the amount of information inquired only in the six-alternative condition. This result was suggested by Hypothesis 5. Figure 4

Ratio of information used

Figure 4 presents the mean percentage of available information inquired about in the decision making process for each condition. This measure was computed in order to examine the relative number of pieces of information inquired during the decision task with different number of alternatives. A two-way analysis of variance was conducted. The main effect of involvement was significant, $F(1,66)=8.50$, $p<.01$. As predicted in Hypothesis 2, the high-involvement condition produced a greater ratio of information used than the low-involvement condition. Furthermore, the main effect of the number of alternatives was highly significant, $F(2,66)= 8.56$, $p<.001$. The multiple comparison test for differences between the number of alternatives revealed that the number of alternatives condition

Figure 5

which encouraged the use of the greatest ratio of the information used to information available was the two-alternative condition. This result is compatible with those reported by Payne (1976). In addition, the interaction was significant, $F(2,66)= 3.39$, $p<.05$. The interaction revealed that involvement had a strong effect on the ratio of information used only in the six-alternative condition. This result supported Hypothesis 5.

Rechecking frequencies

Figure 5 presents the mean rechecking frequencies, that is, amount of reconsidered informationtion for each condition. A two-way analysis of variance was conducted. The main effect of involvement was significant, $F(1,66)=6.18$, $p<.05$. As predicted in Hypothesis 3, subjects more often returned to information they had already inquired about in which they had greater involvement. Furthermore, the main effect of the number of alternatives was significant, $F(2,66)= 5.70$, $p<.01$. The multiple comparison test for differences between the number of alternatives revealed that subjects in the six and ten alternative conditions reconsidered a greater amount of information during the decision task than subjects in the two-alternative condition. In addition, the interaction was marginally significant, $F(2.66)= 2.65$, $p<.08$. The interaction revealed that involvement had a strong effect on the rechecking frequency only in the six-alternative condition. This was suggested by Hypothesis 5. Figure 6

Ratio of rechecking

In order to examine the ratio of rechecking during the decision task with different numbers of alternatives, the relative number of pieces of information inquired about more than once (That is, number of pieces of information picked at least twice divided by the total number of pieces investigated) was computed, arcsine- transformed and served as a dependent measure in the analysis. Figure 6 presents mean the percentage of rechecking for each condition. A two-way analysis of variance was conducted. The main effect of involvement was significant, $F(1,66)=8.55$, $p<.01$. As predicted in Hypothesis 3, the high-involvement condition produced a greater ratio of rechecking than the low-involvement condition. Furthermore, the main effect of the number of alternatives was marginally significant, $F(2,66)= 2.47$, $p<.10$. The multiple comparison test for differences between the number of alternatives suggested that the ten-alternative condition encouraged the use of the greatest proportion of rechecking. In addition, the interaction was marginally significant, $F(2,66)= 2.52$, $p<.09$. The interaction indicated that involvement had a strong effect on the ratio of rechecking only in the six-alternatives condition. This was suggested by Hypothesis 5.

Patterns of information search

The search data for each subject was organized in terms of the patterns of information search. According to the method provided by Payne (1976), the pattern of search was determined, in part, by examining the alternative and attribute associated

with the nth + 1 piece of information inquired about by a subject as a function of the alternative and attribute associated with the n th piece of information searched. If the nth + 1 piece of information searched was within the same alternative but involved a different attribute, then that constituted an instance of the pattern of alternative-wise processing. On the other hand, if the nth + 1 piece of information searched was neither the same attribute, but a different alternative, then that constituted an instance of the pattern of attribute-wise processing.

A measure of alternative processing was given by the number of alternative single step transitions divided by the amount of information searched, and a measure of attribute-wise processing was given by the number of attributive single step transitions divided by the amount of information searched. First, a two-way analysis of variance for the measure of alternative processing was conducted. The main effect of involvement was not significant. This result does not support Hypothesis 4. However, the main effect of the number of alternatives was significant, $F(2,66)= 3.29$, $p<.05$. The multiple comparison test for differences between the number of alternatives revealed that subjects in the six-alternative condition more often used the alternative-wise processing strategy during the decision task than subjects in the two-alternative condition. Second, a two-way analysis of variance for the measure of alternative-wise processing was conducted. All the main effects were not significant. This result does not support Hypothesis 4.

General Discussion

The main purpose of the present study was to examine the effects of personal involvement and task complexity on decision making process, using a method of monitoring information search.

First, as predicted in Hypothesis 1 and Hypothesis 2, subjects in the high-involvement condition spent a greater amount of time inquiring about the information and inquired about more of the information during the decision task than subjects in the low-involvement condition. These results suggested that decision makers who experienced higher levels of involvement use more complex and compensatory decision strategies. The significant interaction between involvement and task complexity indicated that involvement had a strong effect on the amount of information inquired about only in the six-alternative condition. This result, which was consistent with Hypothesis 5 might be due to limited information capacity of humans proposed by Miller(1956) and Simon (1955, 1957). In the two-alternative condition, there were small differences between the high and low involvement condition, because the task with two alternatives required less information processing activity. In the six-alternative condition, there were large differences between the high and low involvement condition, because the task with six alternatives required more information processing activity within the limits of processing capacity. In the ten-alternative condition, there were small differences between high and low involvement condition, because the task with six alternatives required more information processing activity beyond the limits of processing capacity.

Second, as predicted in Hypothesis 3, the high-involvement condition produced a greater frequency and ratio of rechecked information than the low-involvement condition. This result suggested that involved subjects pay more attention to the content of information presented, process this information more systematically, and are less likely to rely on simple heuristics. This finding is compatible with those reported on attitude and judgment research (Borgida & Howard-Pitney, 1983; Chaiken, 1980; Harkness et al., 1985; Petty & Cacioppo, 1990; Cacioppo, & Goldman, 1981). Furthermore, the marginally significant interaction between involvement and number of alternatives indicated that involvement had the strongest effect on frequency and ratio of rechecked information in the six-alternative condition. Although this interaction effect was only marginally significant, the tendency supported Hypothesis 5.

Third, the results of the information search pattern did not support Hypothesis 4, that subjects in the high-involvement condition should use alternative-wise search more likely and attribute-wise search less likely than subjects in the low -involvement condition. This is incompatible with the finding by Harkness et al. (1985) that the selection of judgmental strategies were largely contingent on personal involvement. The result of the present study suggested that the direction of information search was not influenced by involvement.

Last, in the present study, the subjects were presented only ten attributes of potential dating partners in stead of using attributes naturally. More studies that investigate the effects of involvement on decision making are needed. Some of these will require liberation from laboratory conditions in which only a relatively limited set of decision problems have been used. Despite these limitations, this study provides data that point to the importance of involvement and task complexity on the decision making process in providing a more complete account of individual decision making process.

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Footnote 1.

The earlier version of this paper was presented at 24th International Congress of Psychology, Sydney, August 1988.

Footnote 2.

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	Person A	Person B
1. Facial attractiveness	A 1	B 1
2. Height	A 2	B 2
3. Body form	A 3	B 3
4. Sympathy	A 4	B 4
5. Cheerfulness	A 5	B 5
6. Decisive character	A 6	B 6
7. Firm attitude	A 7	B 7
8. Punctuality	A 8	B 8
9. Hobby	A 9	B 9
10. Possibility of acceptance	A 10	B 10

Fig. 1. An example of an information matrix representing different potential dating partners.

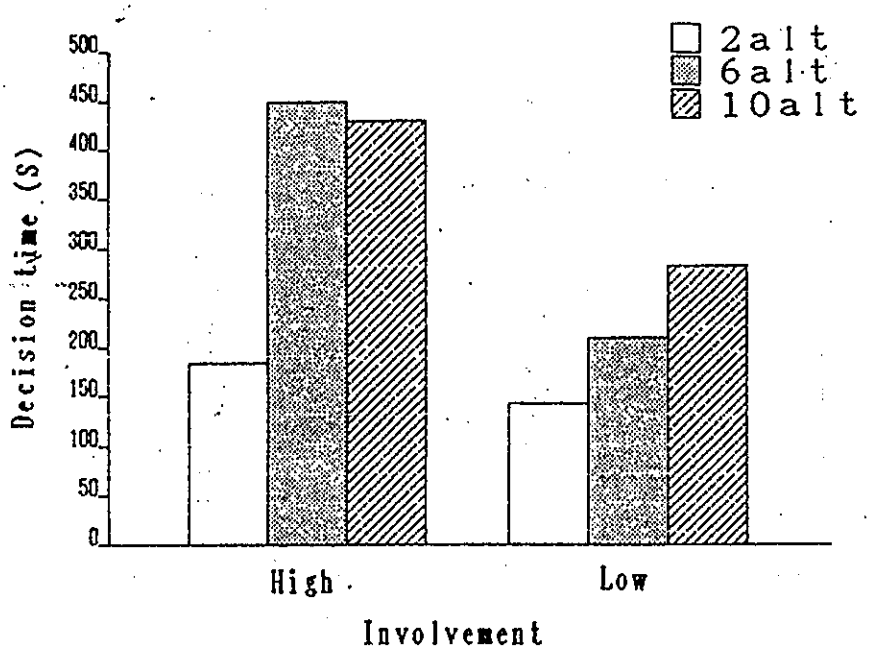

Fig. 2. Mean time required to make a decision for each condition.

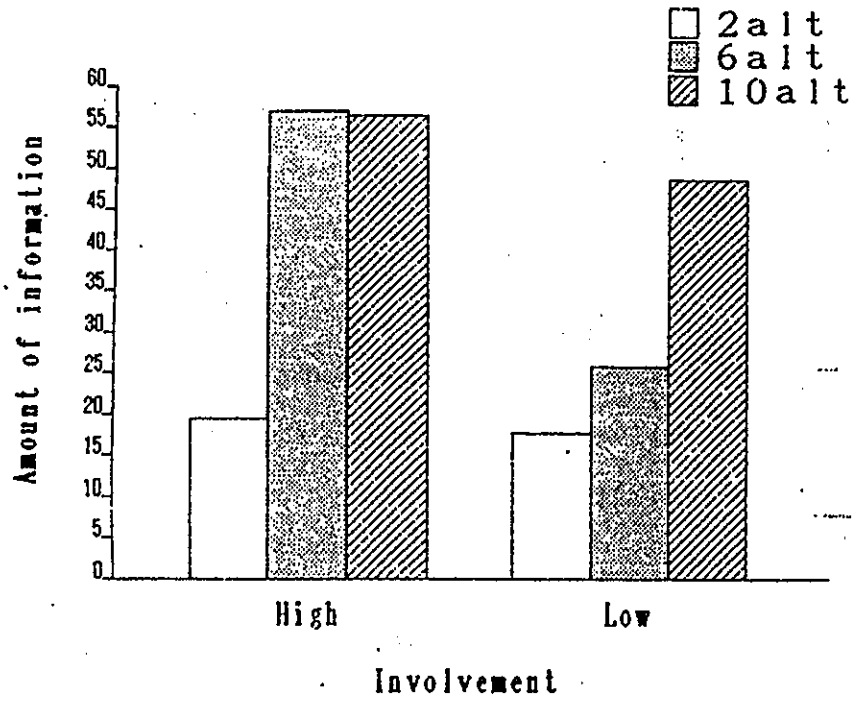

Fig. 3. Mean amount of information inquired about for each condition.

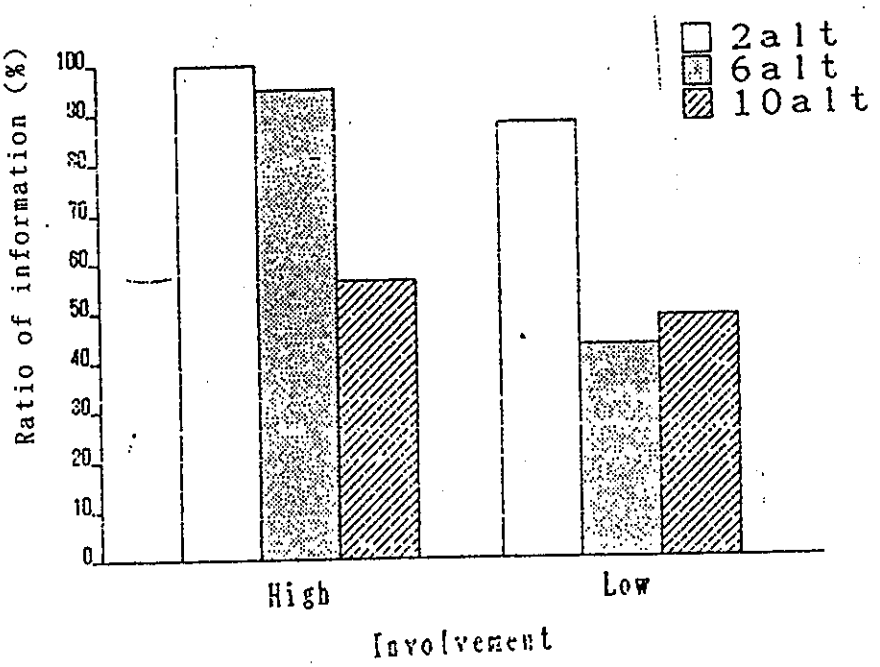

Fig. 4. Mean ratio of information inquired about for each condition.

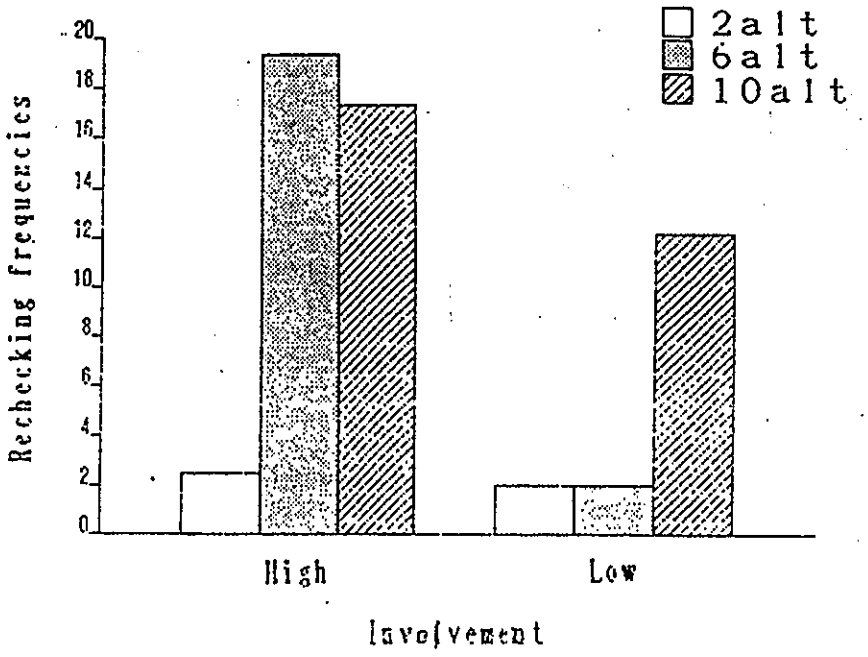

Fig. 5. Mean frequencies of recheking information for each condition.

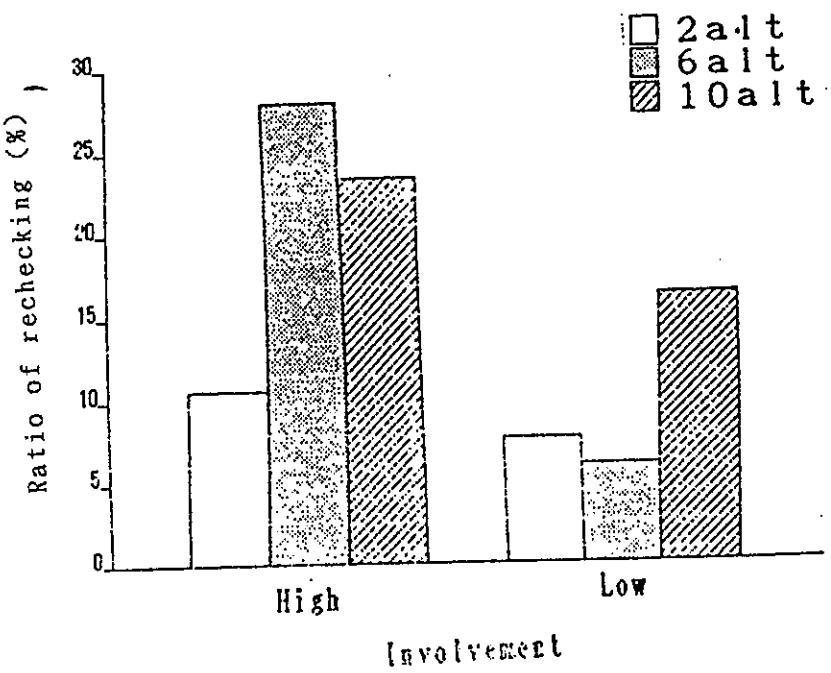

Fig. 6. Mean ratio of recheking information for each condition.