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An analysis of commitment.

William H. Holmes

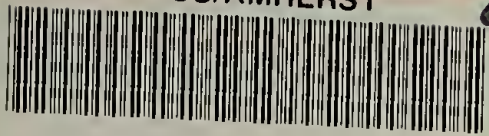
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AN ANALYSIS OF COMMITMENT

A thesis presented

By

William H. Holmes

Submitted to the Graduate School of the
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AN ANALYSIS OF COMMITMENT

A Thesis

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Introduction

Despite the frequent references to commitment in social psychological literature, little seems to have been done in the analysis of its various components. Kiesler and Sakamura (1966) defined commitment as "a binding of the individual to behavioral acts," this binding being inversely related to the amount of inducement offered to an individual for performing an overt act. Moreover, commitment is said to be increased when one increases: the number of acts performed by S (although this relationship may not be linear); the degree of irrevocability of the act; the importance of the act to S; expectancy of positive outcomes associated with the act; and volition of S, manipulated either by increasing the degree of perceived choice or decreasing the external pressure to perform the act. Some consequences of commitment have included increased resistance to attacks on committed beliefs as in the above study, harsh treatment of the misjudged other if committed to a negative evaluation (Walster and Walster, et. al., 1966), and attitude change in the direction of the dissonance arousing but committing act in forced-compliance situations (e.g., Brehm, 1960). However, since studies in general tend to use commitment as an explanation of results, rather than viewing results as explanations of commitment, this construct retains its dispositional qualities leaving one with a vague understanding of its underlying characteristics.

Steiner (1970), in describing components of perceived freedom, has hypothesized that the expected gain derived from achieving a selected alternative is equal to the expected payoff of the goal once attained

minus costs incurred during goal pursuit. In this formulation, expected payoff is conceived to be a function of valence of desired outcome times subjective probability. Valence is equated with the importance an individual places upon achieving his goal; subjective probability is the perceived likelihood of outcome achievement; and cost is the amount of expenditure of prized resources necessary to achieve the desired ends. A review of the literature suggests that this formulation is applicable to the issue of commitment. For example, the manipulations of commitment cited by Kiesler are easily translated into Steiner's language: number of acts performed, act importance, and irrevocability can be regarded as determinants of incurred costs. Volition is synonymous with decision freedom; the greater the number of possible alternatives to pursue, the greater the individual's decision freedom. Commitment in Kiesler's research increases as inducement to perform an overt act decreases, since such a decrease leads to a concomitant decrease in S's perceived obligation to choose the most profitable alternative. In Steiner's language, such a manipulation of decreasing inducement tends to equalize the expected gains associated with various alternatives, and thus to increase decision freedom.

Continuing to use Steiner's concepts, we may assert that commitment occurs when the individual has incurred heavy costs in the pursuit of an alternative, those costs not being retrievable if he shifts to another course of action. Commitment should also occur when the individual has freely chosen to seek one goal rather than another, and especially so if other people are believed to realize that he has freely chosen. Under such circumstances shifting to another goal almost necessarily requires

an admission that one has exercised poor judgment in choosing the first. In general, loss of face should be especially severe if others are aware of the nature of the initial choice, although loss of face in this particular case may also be seen as a result of evaluation apprehension where E plays the role of others (Rosenberg, 1965). Thus, both irretrievable costs and loss of face constitute penalties which much be incurred if one changes his course of action.

It seems probable than an individual who incurs heavy costs while seeking an outcome will tend to experience loss of face if he changes goals even though his initial decision may not have been freely made. Following along the lines of self-perception theory (Bem, 1967), S's willingness to incur costs implies to others, and perhaps to himself as well, that he found the initially "chosen" alternative attractive. Thus the greater the costs incurred in pursuit of an alternative (especially if they are irretrievable costs), the less opportunity the individual has to shift to a new alternative without seeming to have exercised bad judgment. This line of reasoning suggests that the freedom with which one's decision is made tends to become a less important determinant of commitment after heavy costs have been incurred. (Some of the argument developed in this paragraph parallels certain facets of dissonance theory: severe initiation ceremonies make the group seem more attractive; once purchased, expensive items seem attractive, etc. However, dissonance theorists tend to emphasize the enhancement of the goal, whereas the present formulation stresses the losses that must be sustained if the goal is repudiated.)

The present research manipulates decision freedom, level of incurred costs, and the retrievability of costs in a 2 x 2 x 2 design. High levels of the first two variables, and a low level of the third, are hypothesized to favor strong commitment. In addition to these main effects, an interaction effect of decision freedom and level of incurred costs is anticipated: decision freedom should favor commitment when incurred costs are low but not when incurred costs are high. A three-way interaction is also a strong possibility: the impact of decision freedom should be most strongly muted when costs are both high and irretrievable. Commitment is defined as continuation in a costly course of action after it becomes apparent that the action has little possibility of success.

Method

In an experiment supposedly concerned with information processing, S was to guess the identity of either of two objects by asking E not more than twenty relevant questions about the object's characteristics. E always answered "yes" or "no" according to a prearranged schedule of responses. The sequence of responses, as constant for all subjects as possible, and designed to create the impression of good initial progress at low costs, took the following form: yes, yes, yes, no, and yes, for the first five questions, and yes, yes, no, no, no, for the next five. All remaining questions were answered no. However, slight deviation from the schedule by one or two answers was necessary for most subjects in order to avoid giving unbelievable replies and to allay subject suspicion. S was led to believe that successful identification of either object within the twenty question limit, would result in a reward, \$3.00 for those in the high cost, and \$2.50 for those in the low cost conditions, minus total expenses. Cost included either 60 or 10 cents for the first 5 questions (high and low cost respectively) plus ten cents more for each question receiving a "no" answer thereafter. Thus, although incurring different levels of costs, both groups began on the sixth question with equal expected gains (\$2.40). S was required to restrict his first five questions to only one of the two objects but was allowed to shift to the other object if he subsequently decided he was not making progress toward identification of the first. It was expected that the response sequence was so designed that such a realization would occur. Low and high retrievability of costs were achieved by allowing S to

recoup none or all of his incurred costs, respectively, if he shifted to the second object. Decision freedom was manipulated by either letting S freely select which object to identify or by "randomly" assigning S to one of the objects by a lottery which in reality was rigged so that S always drew the object he perceived to be the easier to identify. The major dependent variable was the number of questions asked about the first object before shifting to the second. In order to get information concerning subjective probability and net gain both before and after shifting, S was administered a questionnaire after every fifth question and again after indicating a desire to switch to the second object (Questionnaires A and B, respectively, in Appendix). Ss who did not shift (n = 22) were administered Questionnaire B after the twentieth question. It should be stressed that S was not allowed to shift until after the fifth question. However, immediate shifting thereafter was not expected since S was working on the object thought to be easier and was receiving mostly "yesses." The experiment was ended and S debriefed after he filled out the post-shift questionnaire. S was then paid \$1.50 for his services.

Subjects

A total of 106 paid volunteer subjects gleaned from the student body at the University of Massachusetts at Amherst served in the experiment. Of this number, 40 males and 40 females, equally distributed among treatments, were included in the data, while 26 were discarded because they were included in pretests, indicated awareness of the true nature of the experiment, or incorrectly completed the questionnaires.

Procedure

All Ss were run individually, each randomly assigned to one of eight treatments with the restriction that equal numbers of males and females be included in each cell of the design. After S was seated across from E at a table on which was located a small pile of dimes, he was told the following:

"Back in the 1940's there was a popular radio program called 'Twenty Questions.' Members of a panel were told that their host was thinking of something that was animal, vegetable, or mineral. Panelists attempted to identify that object by asking twenty questions that could be answered either yes or no. Sometimes the panel was very successful, but on other occasions they seemed to get bogged down in unproductive blind alleys, and listeners could see that a rather simple change in the line of questioning would have solved their problem.

This type of radio program is of interest to psychologists because it reveals the steps people take in searching for information, and how they infer new information from that which they already possess. This study is concerned with exactly these processes, so we are going to ask you to play a modified version of the 'Twenty Questions' game.

In the radio version of the game, panelists couldn't stop asking questions until they had identified the object or used up their quota of 20 questions. Consequently, if they happened to go up a blind alley, they were doomed to failure. We are going to alter the rules by asking you to identify either of two objects, instead of just one. You will start off trying to identify one of these two objects, but if you feel that your questions are not moving you along toward the solution, you can shift to the other object and ask your remaining questions about it instead.

High Initial Investment (high incurred costs):

In order to provide an incentive, we are offering a reward. You start off with a fund of \$3.00. (E then slid three dollars worth of dimes over to a location directly in front of S.) The first five questions cost you a total of 60 cents, leaving \$2.40. If you do not succeed in identifying the object with five questions, you may continue with the rest of your questions by either shifting to the other object or staying with the one you started on. All questions after the fifth question that get "no" answers will cost you a dime apiece. Questions that get "yes" answers will cost nothing.

Non-Retrievable costs:

Remember, you may shift to the other object at any time following the fifth question. Your total payoff for identifying either object will be the original \$3.00 minus the 60 cents for the first 5 questions and 10 cents for every additional "no" question you ask about either object.

Retrievable costs:

If at any time after the fifth question you decide to shift to the other object, any cost you have incurred on the first object will be cancelled, and you will start asking your remaining questions with your original fund intact. Your first five questions about the second object will again cost 60 cents and all subsequent questions that get "no" answers will cost 10 cents apiece. Consequently, your total payoff will be the original \$3.00 minus 60 cents for the first 5 questions about the object you identify, minus 10 cents more for each "no" question you ask about that object.

Low Initial Investment (low incurred costs):

In order to provide an incentive, we are offering a reward. You start with a fund of \$2.50. (E then slid \$2.50 worth of dimes over to S's side of the table.) The first five questions cost you a total of 10 cents, leaving you \$2.40. If you do not succeed in identifying the object with five questions, you may continue on with the rest of your questions by either shifting to the other object or staying with the one you started on. All questions after the fifth that get "no" answers will cost you a dime apiece. Questions that get "yes" answers will cost you nothing.

Both Non-Retrievable and Retrievable costs:

(Follows as noted above under High Initial Investment save for the replacement of the quantities \$3.00 and 60 cents with \$2.50 and 10 cents, respectively.)

The two objects which you may identify are both animal. In addition, I will tell you the following facts about them.

Object A is:

Larger than a baseball
Multi-colored
Found many places

Object B is:

Smaller than a baseball
Usually one color
Found few places"

The necessity of having all Ss begin on what they perceived to be the easier object presented a problem for those in the Low Decision Freedom (i.e., "randomly" assigned) condition. In order to insure that these Ss were assigned the "easier" object without revealing their private

preference to E and thereby committing themselves to that choice, the following spiel concerning an anonymous poll of Ss' preferences was introduced:

"Some people find one of these two objects easier to identify, and it is to your advantage to be working on the one that is easier. In an earlier study we found that ability to pick the one that is easier is correlated with several measures of practical judgment. In order to further study this relationship we need to know for sure which object is the easier to identify.

High Decision Freedom:

Therefore, I will ask you to indicate on a slip of paper which object you think is easier to identify. Of course, that object will be the one about which you will ask your first five questions.

Low Decision Freedom:

Therefore, I will ask you to indicate on a secret ballot which object you think is easier to identify. Of course, the object about which you must ask your first five questions will be determined randomly.

However, you can change from that one to the other later on, according to the shifting rules we stated before. Study the information (E then handed S a printed listing of the characteristics of the two objects), and then just write down on this ballot the letter 'A' or the letter 'B' depending on which object you think is easier to identify. Then fold the slip of paper and throw it into this pile of previously marked ballots."

While S studied the information (for not more than three minutes), and cast his vote, E was across the room attending to other test materials on a table. This was done 1) to adapt S to E being across the room and thereby reduce suspicion whenever E repeated this move later in the experiment, and 2) to make the voting situation more secretive and therefore less committing.

In order to insure that S in the LDF condition drew what he perceived as the easier object, it was necessary for E to sift through the pile of ballots containing S's vote, read that ballot, and then select

from two prestacked lottery boxes that which contained only S's choice, all without detection. Thus, to divert S's attention away from E, a "review test" (see Appendix) was administered to all Ss. After S voted, E returned from across the room, and while collecting the ballots (all of which, for the sake of identification, had been inconspicuously pre-marked, save that used by S) stated the following:

"Now, to make sure that you clearly understand the directions, I want to give you a little test regarding the experiment. Simply answer the questions as best you can, and then we will proceed with the experiment."

Low Decision Freedom

While S was occupied with the test, E casually returned to the materials table, found S's ballot (the only one not premarked), and returned to S with the appropriate box. When S finished the test E pretended to correct it, saying:

"OK, everything looks fine on the test...good...we can start. (If S made any errors, E repeated the appropriate directions to rectify the misunderstanding.) Now, to determine which object you will start to identify, I'm going to ask you to draw out a slip of paper from this box. (S then drew from the stacked box to learn that he was to start on whichever he believed was easier.) So you will start asking questions about _____. Remember that your first five questions cost you _____ cents. Any further questions for which the answer is "no" cost you a dime apiece. If you correctly identify the object you win \$3.00 (\$2.50) minus the cost of the first five questions and any "no" questions thereafter.

Non-Retrievable costs:

You can shift from one object to the other any time after the fifth question but your total costs will then include 10 cents for each additional 'no' answer you receive plus the costs you have already incurred on the first object.

Retrievable costs:

You can shift from one object to the other any time after the fifth question, but if you shift, all previously incurred costs will be cancelled. You will then start over with your original fund of \$3.00 (\$2.50) minus the 60 (10) cents for the next five questions plus the additional 10 cents for each 'no' answer you receive about the second object.

Remember, since you have only 20 questions to identify either object A or B, it is to your advantage to ask logical questions. Therefore, phrase your questions carefully so that you do not waste questions by asking the same thing twice. You may take notes on this piece of paper if you like. (E then gave S a slip of paper and a pencil.) (This last block of instruction was added both to increase impact and to aid E in following his prearranged schedule of responses more closely. Pretests showed that some Ss, either through accident or design, tended to use past answers as a basis for programming subsequent, somewhat repetitive questions, thereby assuring unscheduled, free "yes" answers.)

High Decision Freedom:

While S was occupied with the test, E simply placed the ballots on the materials table and returned to S empty-handed. When S finished the test, E pretended to correct it, saying:

"OK, everything looks fine on the test...good...we can start. Now, with which object would you like to begin? (S then responded). So, you will start asking questions about _____. Remember that your first five questions...(same as for LDF from this point on)."

After S had asked and E had answered the fifth question, E withdrew the appropriate amount of dimes from S's pile and then added:

"Now, every so often, I'll ask you if you would like to shift or continue, just as a sort of reminder to you that you do have that option. However, bear in mind that from this point on, you may shift any time you like. Now, would you like to shift or continue?"

After indicating whether or not they wished to shift, all Ss, including those who decided to shift at this point ($n = 5$), were administered Questionnaire A. If continuation was desired and after completing the questionnaire, S continued his questioning while E responded appropriately, mostly no's, so that little progress was made and costs continued to mount (as indicated by E pulling away more and more dimes from S's pile). If S did not shift before asking the tenth question, questionnaire A was administered for a second time after the tenth question was

answered. Questionnaire A was repeated for a third and last time following the 15th question if shifting did not occur before that point.

When S indicated a desire to shift, or when he used up his quota of 20 questions on the first object, he received Questionnaire B. Following completion of this questionnaire, the experiment was terminated and S was debriefed.

answered. Questionnaire A was repeated for a third and last time following the 15th question if shifting did not occur before that point.

When S indicated a desire to shift, or when he used up his quota of 20 questions on the first object, he received Questionnaire B. Following completion of this questionnaire, the experiment was terminated and S was debriefed.

Analysis and Results

Number of Questions Asked Before Shifting

Table 1 presents cell means for the number of questions asked by S before requesting to shift to the alternative object. Sex is treated as an added factor. As nobody shifted after asking fifteen questions, all Ss who had not shifted by the 15th question were given a score of twenty. A four-way analysis of variance was performed on these data. As can be seen in Table 2, only a main effect for cost, which was opposite to prediction, and a four-way interaction, depicted in Figure 1, were significant.

 Insert Tables 1, 2, and Figure 1 about here

Subjects' Perception of the Situation: Manipulation Effects

Since predicted effects on the number of questions asked before shifting were not obtained, it is particularly important to examine how Ss perceived their situation and whether those perceptions varied across manipulations and over time. Here we will report effects of the manipulations on perceptions subjects held both after asking their first five questions and when they indicated a desire to shift to the second object or had used up their quota of twenty questions. Subsequent sections will then deal with changes in perception over time as well as differences in perception among Ss who shifted at different points in their questioning.

Subjects' ratings after the fifth question. A multivariate

TABLE 1

Mean Number of Questions
Asked Before Shifting

	High Costs		Low Costs	
	Males	Females	Males	Females
High Decision Freedom				
Retrievable costs	12.20	13.00	14.40	14.60
Nonretrievable costs	11.60	11.20	15.20	8.80
Low Decision Freedom				
Retrievable costs	10.60	11.20	17.00	11.80
Nonretrievable costs	13.40	10.00	14.40	18.20
Marginals:				
Males	13.600			
Females	12.350			
High Costs	11.650*			
Low Costs	14.300			
Retrievable	13.100			
Nonretrievable	12.850			
High Freedom	12.625			
Low Freedom	13.325			

*p < .05

TABLE 2
 Analysis of Variance For
 The Number of Questions
 Asked Before Shifting

SOURCE	DF	MS	F
Sex (A)	1	31.250	1.345
Cost (B)	1	140.450	6.046*
Retrievability (C)	1	1.250	.054
Decision Freedom (D)	1	9.800	.422
A X B	1	8.450	.364
A X C	1	2.450	.105
A X D	1	.800	.034
B X C	1	.050	.002
B X D	1	39.200	1.687
C X D	1	51.200	2.204
A X B X C	1	18.050	.777
A X B X D	1	20.000	.861
A X C X D	1	51.200	2.204
B X C X D	1	7.200	.310
A X B X C X D	1	105.800	4.554*
Error	64	23.231	

*p < .05

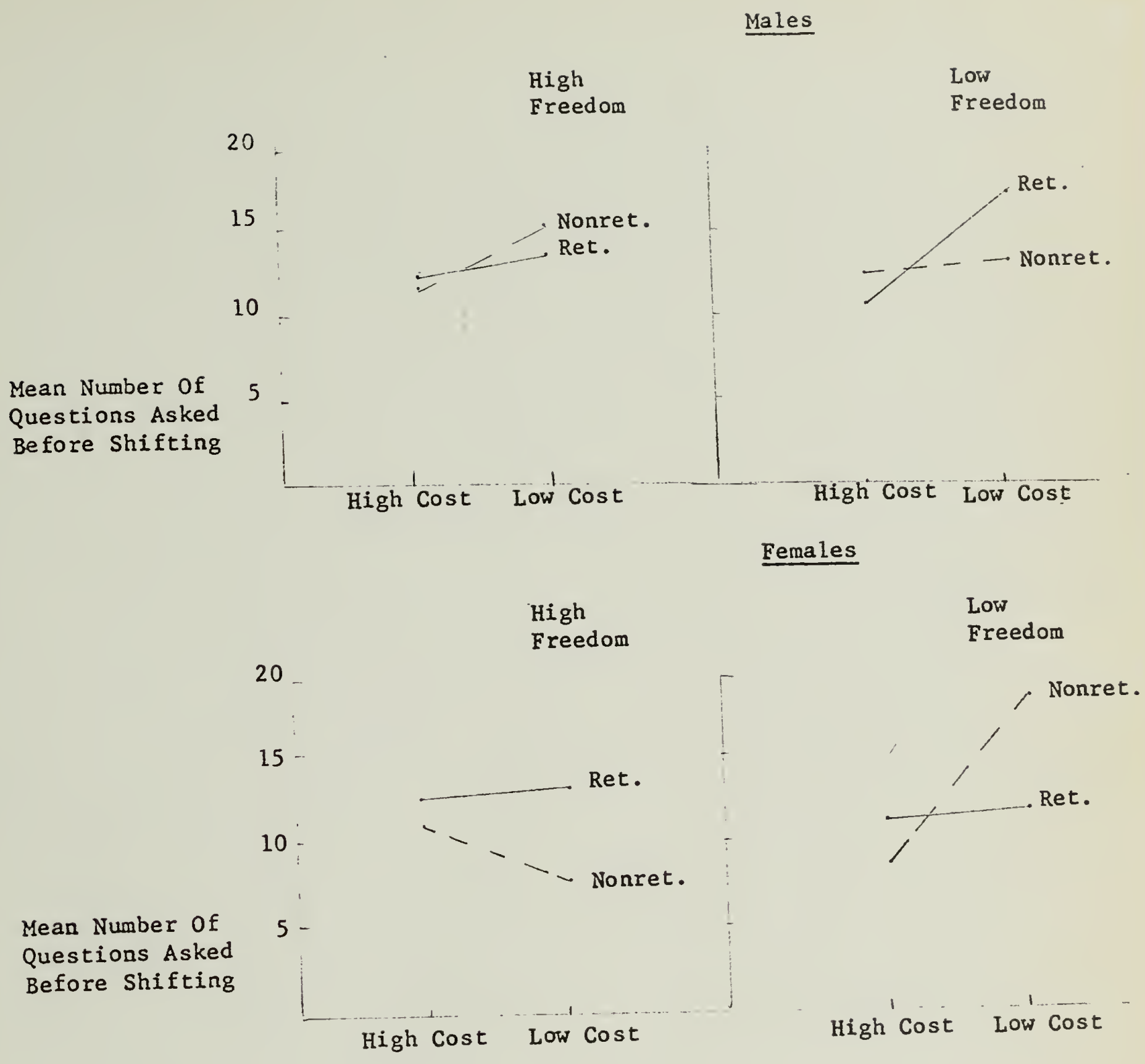


Fig. 1. Mean number of questions asked as a function of sex, cost, retrievability, and decision freedom.

analysis of variance was run for all responses on the first administration of Questionnaire A, i.e., after S had asked his first five questions. All means are reported in the Appendix. Here we shall discuss only the significant results. As can be seen in Table 3, after asking their first five questions, males, Ss whose investments would be retrieved if they shifted, and those who had freely chosen the object they were attempting to identify, tended to believe that they would win significantly more money by shifting to the alternative object than did females, Ss whose investments would not be returned, and those who were randomly assigned an object, respectively.

Subtracting the amount of money Ss thought they would win if they shifted to the second object from the expected gain associated with successful identification of the first produced a difference score reflecting the relative profit expected to result from sticking with the first object. As Table 4 reveals, Ss in the Low Retrievable condition expected to profit significantly more by staying with the first object than did those in the Retrievable group.

A four-way interaction for the degree to which Ss felt that their first five questions were logical was also found (See Table 5).

 Insert Tables 3, 4, and 5 about here

Responses to Questionnaire B. It is to be recalled that Questionnaire B was administered to all Ss immediately after they had indicated their desire to shift to the alternative object, or, in the case of those who did not indicate such a desire, immediately after the twentieth

TABLE 3

Mean Amount of Money Expected To Win
If Shift To Alternative Object After
Asking First Five Questions

	High Costs		Low Costs	
	Males	Females	Males	Females
High Decision Freedom				
Retrievable costs	\$1.24	\$1.70	\$1.54	\$.90
Nonretrievable costs	\$1.28	\$1.05	\$1.32	\$1.04
Low Decision Freedom				
Retrievable costs	\$1.30	\$1.00	\$1.36	\$1.20
Nonretrievable costs	\$.98	\$.62	\$1.12	\$.44
Marginals:				
Males		\$1.27*		
Females		.99		
High Costs		\$1.15		
Low Costs		1.12		
Retrievable		\$1.28*		
Nonretrievable		.98		
High Freedom		\$1.26*		
Low Freedom		1.00		

*p < .05

TABLE 4

Mean Profit Expected To Be Made
By Sticking With First Object
After Asking First Five Questions

	High Costs		Low Costs	
	Males	Females	Males	Females
Retrievable costs	\$.00	\$.18	\$.14	\$.14
High Decision Freedom				
Nonretrievable costs	\$.39	\$.48	\$.26	\$.28
Retrievable costs	\$.24	\$.06	\$.26	\$.06
Low Decision Freedom				
Nonretrievable costs	\$.58	\$.26	\$.56	\$.83
Marginals:				
Males		\$.30		
Females		.29		
High Cost		\$.27		
Low Cost		\$.32		
Retrievable		\$.14*		
Nonretrievable		.46		
High Freedom		\$.23		
Low Freedom		.36		

* $p < .01$

TABLE 5

Mean Self-ratings For Degree of
Logic For First Five Questions

	High Costs		Low Costs	
	Males	Females	Males	Females
High Decision Freedom				
Retrievable costs	2.80	3.40	4.20	3.60
Nonretrievable costs	3.40	2.60	2.80	4.20
Low Decision Freedom				
Retrievable costs	3.40	2.60	2.60	3.00
Nonretrievable costs	1.40	3.40	3.60	3.40
Marginals:				
	Males	3.025		
	Females	3.275		
	High Cost	2.875		
	Low Cost	3.425		
	Retrievable	3.200		
	Nonretrievable	3.100		
	High Freedom	3.375		
	Low Freedom	2.925		

Note: The smaller the number, the greater the degree of logic perceived.

question. Thus, responses to this questionnaire indicate Ss' perceptions of the situation that had developed by the time questioning was terminated.

Questionnaire B included 5 two-alternative items designed to assess the extent to which Ss acknowledged "loss of face" as a reason for not having shifted earlier (See Appendix B). Each item paired a statement admitting loss of face with one citing a different reason for persisting on the first object. Chi square analysis revealed that Ss who acknowledge loss of face on one item tended also to acknowledge it on other items (p values ranged from .001 to .05). In view of the inter-item consistencies, a total loss-of-face score was computed by counting the number of times (out of 5) S selected the loss-of-face alternative as the one that more accurately represented his reasons for persisting with object one. Means of these scores are reported separately for each treatment group in Table 6.

Analysis of variance performed on loss-of-face scores revealed significant main effects of sex ($F = 9.102$, $p < .01$), costs ($F = 4.302$, $p < .05$), and retrievability of costs ($F = 9.102$, $p < .01$). Females, subjects in the Low Cost condition, and those whose costs were retrievable expressed more loss of face than did males, subjects in the High Cost condition, and those whose costs were not retrievable. There was also a significant interaction effect of cost and decision freedom. Figure 2 indicates that costs had little effect when decision freedom was high, but large effects when decision freedom was low.

 Insert Table 6 and Figure 2 about here

Table 7 reports the mean amounts of money subjects in each treatment category expected to win by shifting to the second object. Analysis of variance indicated that subjects for whom costs were retrievable expected to earn significantly more by shifting than did those for whom costs were not retrievable ($F = 10.632, p < .01$). Other effects were not significant.

 Insert Table 7 about here

An interaction of cost and sex, as graphed in Figure 3, appeared for money expected to be won upon successful identification of the first object. Here differences between males and females are accentuated when costs were low.

 Insert Figure 3 about here

A score indicating the amount of net profit \underline{S} believed he stood to gain by shifting was computed by subtracting the sum he estimated he would earn by shifting to the second object from the amount he would receive by persisting on the first. The means of these net profit scores are reported in Table 8. Analysis of variance indicated that subjects who had initially invested only ten cents expected a smaller

TABLE 6

Mean Loss Of Face Scores
For Questionnaire B

	High Costs		Low Costs	
	Males	Females	Males	Females
High Decision Freedom				
Retrievable costs	2.60	2.80	1.80	3.00
Nonretrievable costs	.60	2.20	1.40	1.60
Low Decision Freedom				
Retrievable costs	.80	2.20	3.00	3.60
Nonretrievable costs	1.20	2.00	2.00	2.40
Marginals:				
Males		1.675**		
Females		2.475		
High Costs		1.800*		
Low Costs		2.350		
Retrievable		2.475**		
Nonretrievable		1.675		
High Freedom		2.000		
Low Freedom		2.150		

Note: the greater the number, the greater the degree of loss of face expressed.

* p < .05
** p < .01

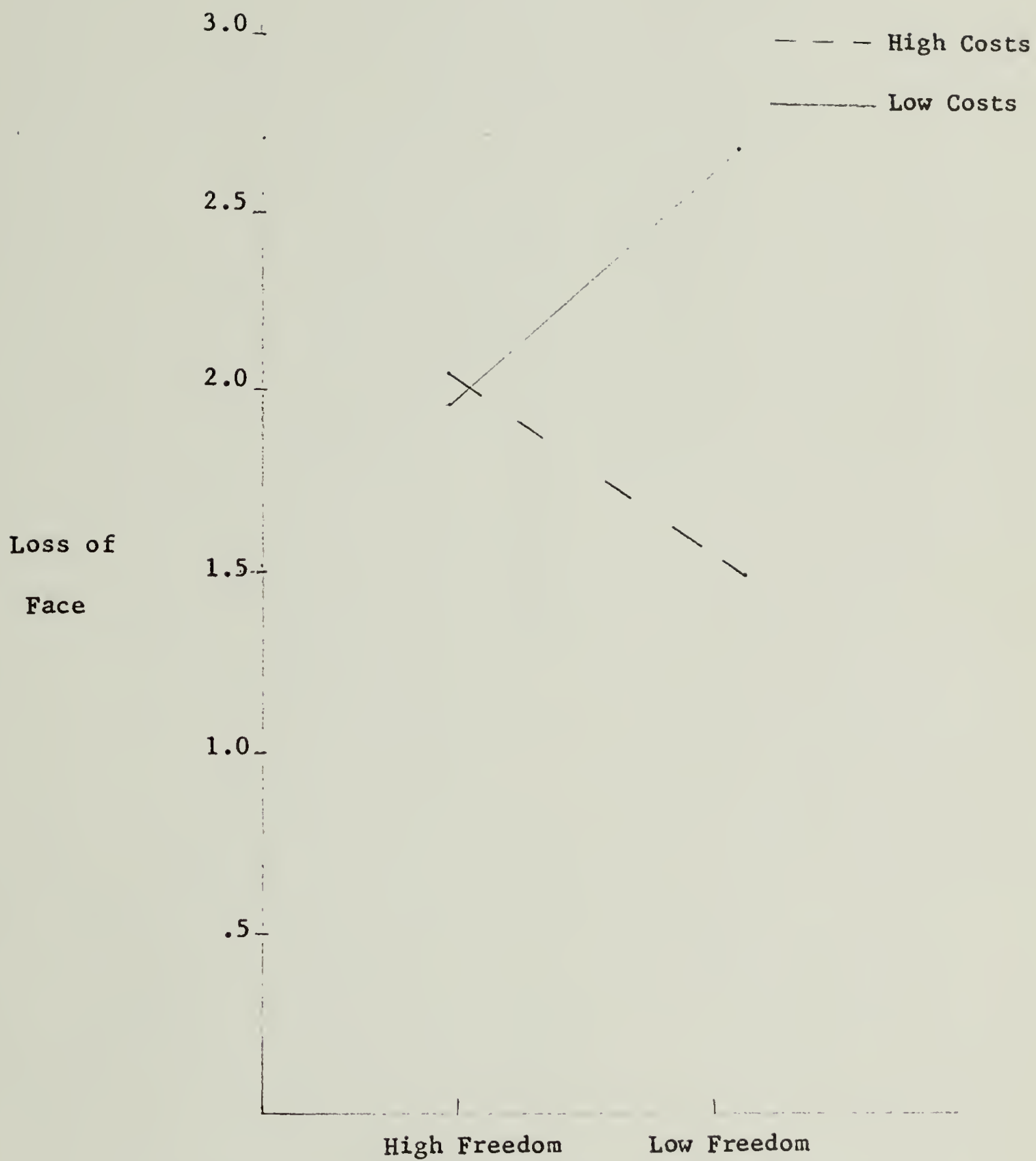


Fig. 2. Mean loss of face scores plotted as a function of decision freedom with cost as a parameter.*

*Interaction significant at $p < .05$

TABLE 7

Mean Expected Gain Associated With Successful
Identification of Second Object
(Questionnaire B)

	High Costs		Low Costs	
	Males	Females	Males	Females
High Decision Freedom				
Retrievable costs	\$1.44	\$1.26	\$1.64	\$1.04
Nonretrievable costs	\$1.12	\$.76	\$1.06	\$1.04
Low Decision Freedom				
Retrievable costs	\$1.66	\$1.10	\$.84	\$1.30
Nonretrievable costs	\$.88	\$.66	\$.86	\$.44
Marginals:				
Males		\$1.19		
Females		.95		
High Costs		1.11		
Low Costs		1.03		
Retrievable		1.29**		
Nonretrievable		.85		
High Freedom		1.17		
Low Freedom		.97		

**p < .01

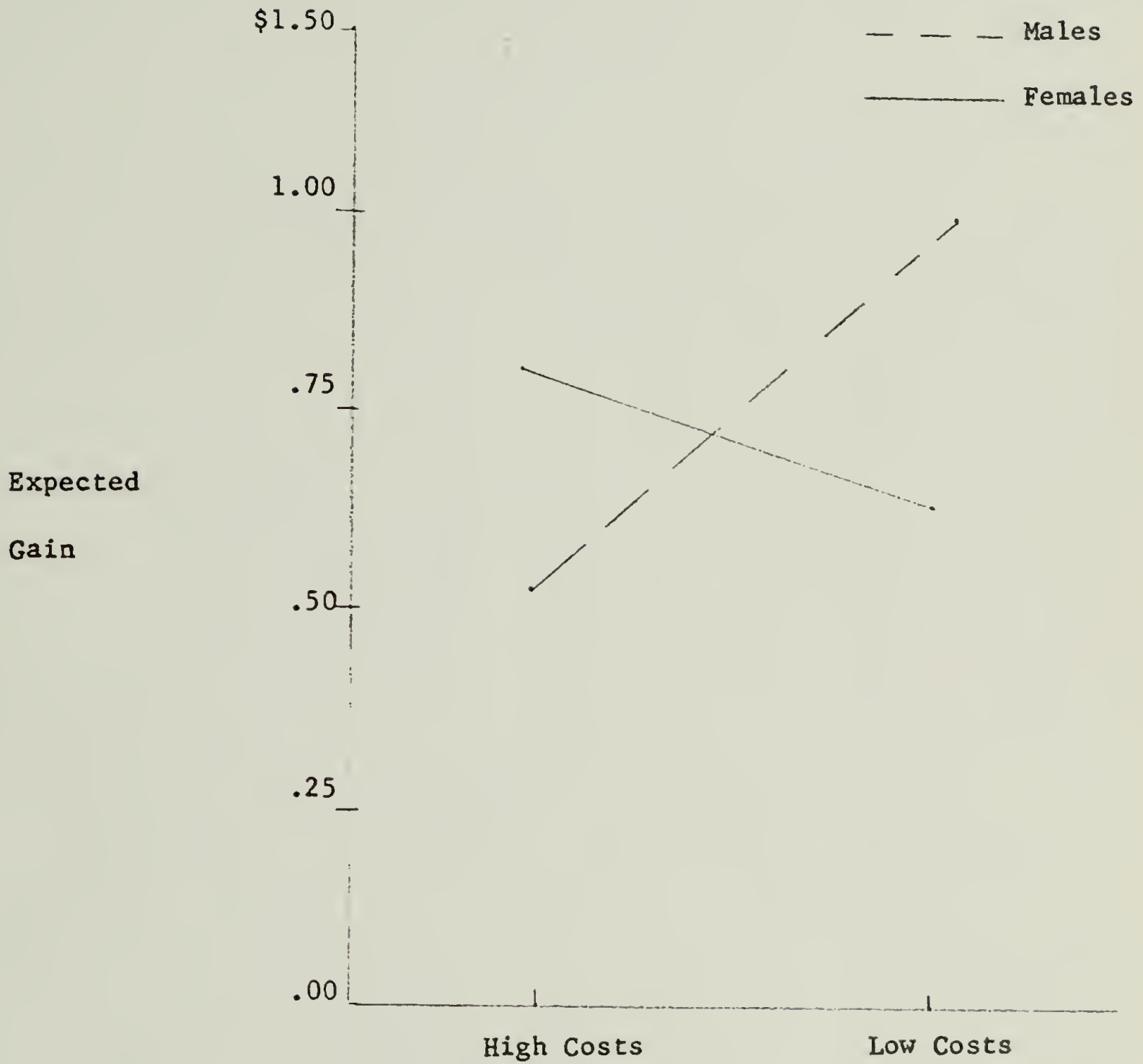


Fig. 3. Mean post-shift expected gain associated with eventual identification of first object plotted as a function of cost with sex as a parameter.*

*Interaction significant at $p < .05$

profit (greater loss) from shifting than did subjects who initially invested 60 cents ($F = 4.069$, $p < .05$), and those in the Retrievable Costs condition tended to expect a greater profit than their Nonretrievable Costs counterparts ($F = 5.302$, $p < .05$). Moreover, a significant sex by cost interaction was obtained, indicating that the differences between the two sexes was accentuated when costs were high. Figure 4 reports this interaction. (However, since a significant sex by cost interaction was found on expected winnings associated with the first object in the absence of a significant sex by cost interaction on that associated with the second, the profit calculation amounted to the simple subtraction of a constant from those values graphed in Figure 3 thereby producing these essentially redundant data.)

 Insert Table 8 and Figure 4 about here

Lastly, with respect to the degree to which Ss perceived their questions to be logical, a main effect for retrievability was discovered. As is pointed out in Table 9, Nonretrievable Ss characterized their questions as more logical than did Retrievable Ss ($F = 5.173$, $p < .05$). The three-way interaction of Figure 5 for sex, retrievability, and decision freedom was also significant: whereas low freedom separated retrievable from nonretrievable male subjects, it was high freedom that separated the two retrievable groups of females. An interaction involving all four factors was significant and is graphed in Figure 6.

TABLE 8

Mean Profit Expected In Shifting To Second
Object Rather Than Continuing On With The First
(Questionnaire B)

	High Costs		Low Costs	
	Males	Females	Males	Females
Retrievable costs	\$-.86	\$-.26	\$-.60	\$-.40
High Decision Freedom				
Nonretrievable costs	\$-.50	\$+.04	\$-.08	\$-.26
Retrievable costs	\$-1.32	\$-.22	\$+.30	\$-.54
Low Decision Freedom				
Nonretrievable costs	\$-.34	\$-.28	\$+.04	\$+.06
Marginals:				
Males		\$-.42		
Females		-.23		
High Costs		-.47*		
Low Costs		-.19		
Retrievable		-.49*		
Nonretrievable		-.17		
High Freedom		-.37		
Low Freedom		-.29		

Note: the more negative the number, the greater the profit expected in shifting to the second object.

* $p < .05$

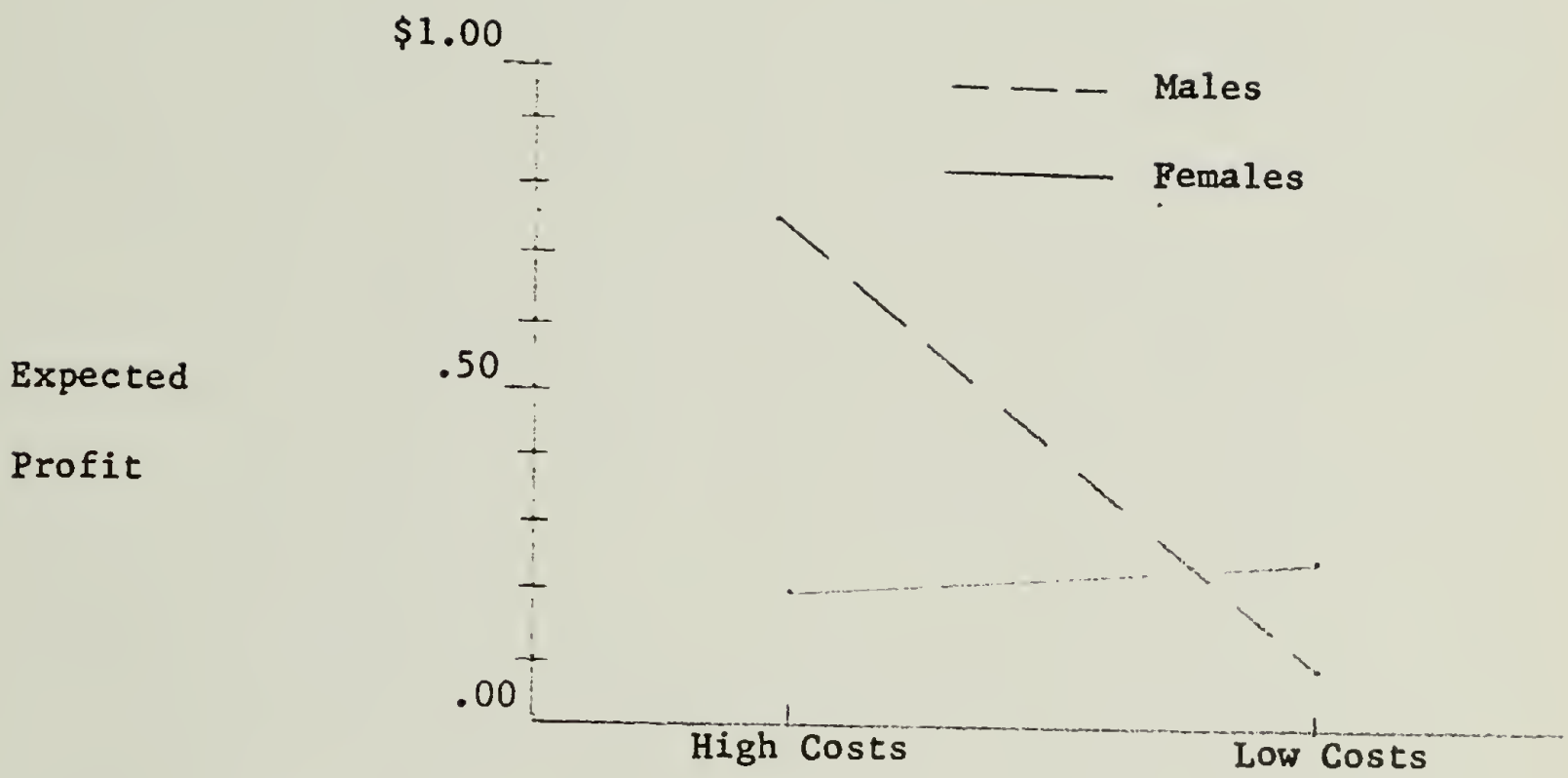


Fig. 4. Mean profit expected as a result of shifting to second object plotted as a function of cost with sex as a parameter.**

**Interaction significant at $p < .01$

Insert Table 9 and Figures 5 and 6 about here

Perceptual Differences Between Differentially Shifting Subjects

Analysis of subjects' perceptions thus far has been concerned with manipulation effects on responses to the first administration of Questionnaire A and the post-shift instrument, Questionnaire B. However, further insight may be gained by grouping Ss into three "shifting" classes, based upon the number of questions each S asked before shifting. Such a grouping procedure enables one to determine: the degree to which the cognitive maps of subjects tend to differ as a function of shifting early, late, or not at all; whether a significant change occurs in the average subject's cognitive map as he moves from his fifth question to a point where he decides to shift (or pose his twentieth question); and whether the rate of such change differs for subjects in different shifting classes. Such an analysis also allows for comparisons (where possible) between average perceptions of differentially shifting subjects at successive points in time (as indexed by responses to each administration of the questionnaires). These analyses and their results follow.

Changes in perceptions over time. All Ss were divided into three "shifting" classes: those who shifted after asking five to ten questions, inclusive (shifting class 1, or SC 1); those who shifted after asking eleven to fifteen questions (SC 2); and those who asked the full twenty, i.e., did not shift to the alternative object at any point in their questioning (SC 3). Main effects for shifting class (SC), and time (T),

TABLE 9

Mean Degree To Which Questions Were Perceived
To Be Logical
(Questionnaire B)

	High Costs		Low Costs	
	Males	Females	Males	Females
Retrievable costs	3.60	4.80	4.00	3.80
High Decision Freedom				
Nonretrievable costs	3.40	2.40	3.80	3.60
Retrievable costs	5.40	3.80	3.80	5.00
Low Decision Freedom				
Nonretrievable costs	2.20	4.40	3.40	4.40
Marginals:				
Males		3.700		
Females		4.025		
High Costs		3.750		
Low Costs		3.975		
Retrievable		4.275*		
Nonretrievable		3.450		
High Freedom		3.675		
Low Freedom		4.050		

Note: the smaller the number, the greater the degree of logic perceived.

*p < .05

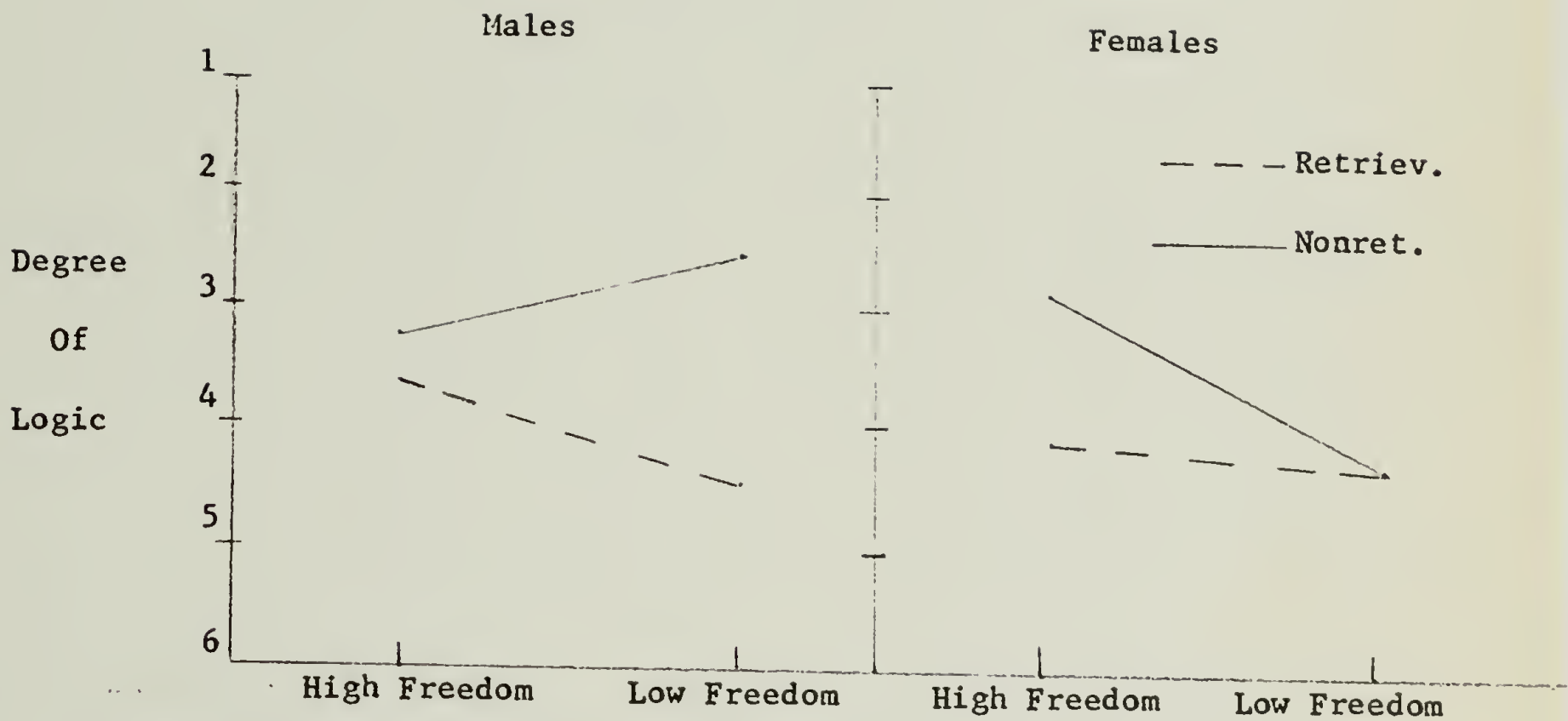


Fig. 5. Mean degree to which questions were perceived to be logical, plotted as a function of decision freedom with retrievability of costs and sex as parameters.*

Note: the smaller the number, the greater the degree of logic perceived.

* $p < .05$

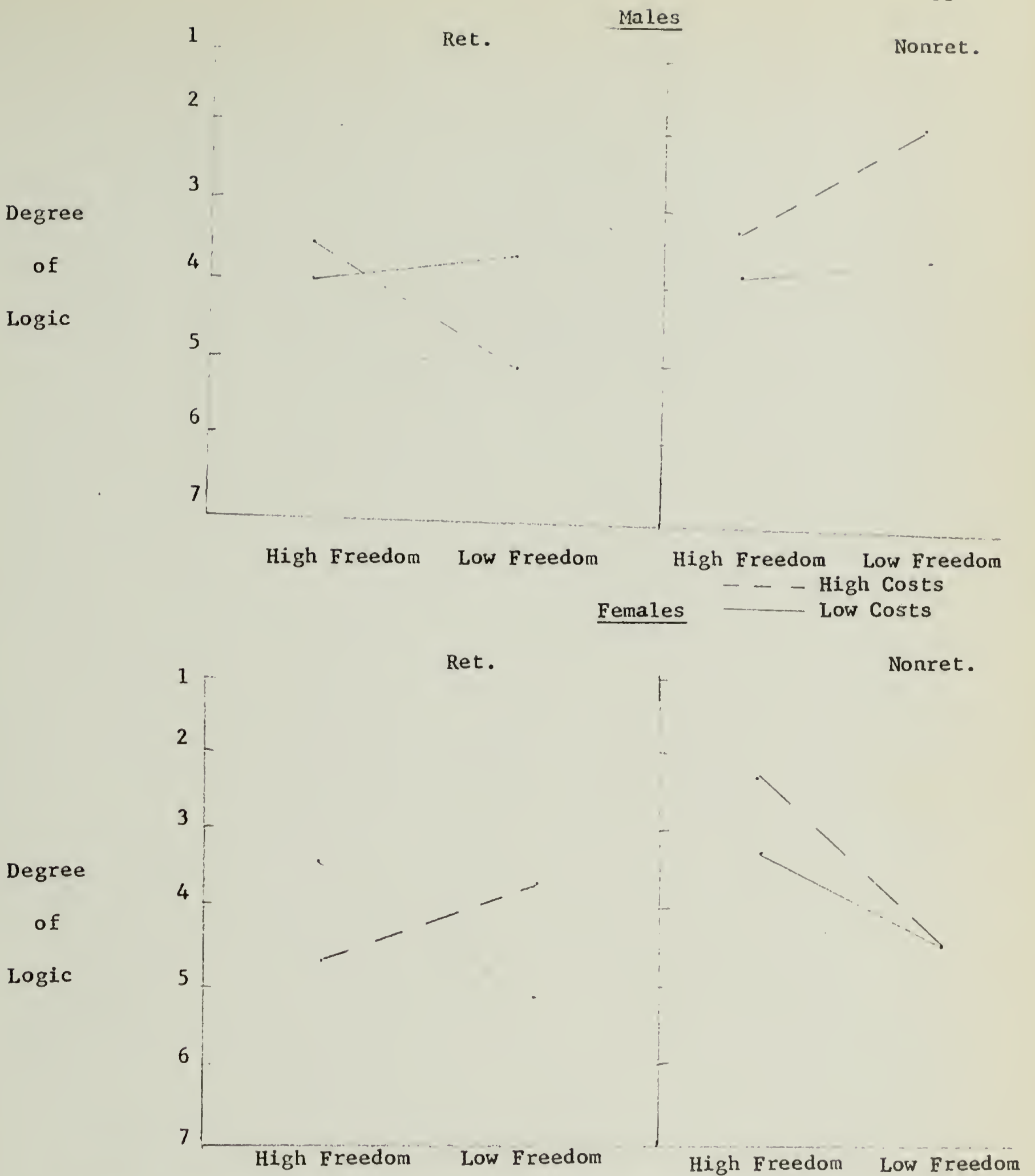


Fig. 6. Mean degree to which questions were perceived to be logical, plotted as a function of decision freedom with cost, retrievability, and sex as parameters.*

Note: the smaller the number, the greater the degree of logic perceived.

*p < .05

as well as a SC X T interaction were tested by running a 3 X 2 analysis of variance (3 SC groups; two points in time, Questionnaires A and B) on five dependent measures in order to discover whether Ss who shifted early, late, or not at all differed in their perceptions of the situation; whether any perceptual changes occurred over the course of questioning; and whether shifting at different points was accompanied by different rates in those changes. Shifting class and time were treated as between- and within- subject variables, respectively. The five dependent variables, plotted separately for each class in Figures 7 through 11, were: subjective probability of, and the expected gain associated with, successful identification of the first object; gain expected as a result of shifting to the second object rather than continuing on with the first; expected profit associated with sticking with the first object rather than shifting; and the degree to which Ss thought their questions to be logical.

For all five dependent measures, only a main effect for time was found ($p < .001$); neither the main effects for shifting class nor the two-way interaction were significant. Inspection of Tables 10 through 14 indicates that subjects in all three shifting classes tended to manifest the same cognitive changes as they proceeded through the questioning period. Thus, regardless of whether subjects shifted almost immediately after responding to Questionnaire A1 or did not shift at all (asked 15 more questions without shifting), subjects manifested the same changes between Questionnaire A1 and Questionnaire B. They became less confident that they would identify object one (Table 10), expected to win less money by identifying either object one (Table 11) or object two (Table 12),

Insert Tables 10-14 about here

anticipated that less profit would accrue by continuing to focus on object one rather than shifting (Table 13), and felt that their questions were less logical (Table 14).

The fact that time (Questionnaire A1 vs. Questionnaire B) did not interact with shift group may be interpreted to mean that there were no significant differences between groups in either amount or direction of change. Thus some subjects (SC1) changed as much by asking a very few questions as did other subjects (SC2 or SC3) by asking many questions. But all three groups of subjects changed in essentially the same ways.

Differences between the perceptions of shifting classes. The previously reported failure to obtain a significant main effect of shifting classes makes further comparisons of those groups somewhat dubious. However, the previous analysis concerned only data from Questionnaire A1 and B, and said nothing about the possible differences between responses to Questionnaires A2 and A3. This section concerns such differences and also reports the results of further analysis of differences between responses to Questionnaire A1 and B. Needless to say, the latter analysis must be regarded as exploratory rather than definitive. t tests are employed to evaluate differences between pairs of mean scores.

Figure 7 depicts each shifting class's mean subjective probability of successfully identifying the first object at each point in time. No significant differences were found between any pair of shifting classes,

TABLE 10

Mean Subjective Probabilities That S Will
Successfully Identify First Object, With
Shifting Class and Time as Independent Variables

Shifting Class	Time	
	Questionnaire A1	Questionnaire B
1 (5-10)	4.97	7.09
2 (11-15)	3.91	7.26
3 (20)	4.23	6.64
Marginals:		
	A1	4.37*
	B	7.00
	SC 1	6.03
	SC 2	5.59
	SC 3	5.43

Note: The greater the number, the less the subjective probability.

* $p < .001$

TABLE 11

Mean Amounts of Money Expected To Be Won
Upon Successful Identification of the First
Object, With Shifting Class and Time
As Independent Variables

Shifting Class	Time	
	Questionnaire A1	Questionnaire B
1 (5-10)	\$ 1.37	\$.77
2 (11-15)	1.57	.79
3 (20)	1.36	.65

Marginals:

A1	\$ 1.43*
B	.74
SC 1	\$ 1.07
SC 2	1.18
SC 3	1.01

* $p < .001$

TABLE 12

Mean Amounts of Money Expected To Be Won
In Shifting To Second Object, With Shifting
Class and Time As Independent Variables

Shifting Class	Time	
	Questionnaire A1	Questionnaire B
1 (5-10)	\$ 1.18	\$ 1.21
2 (11-15)	1.19	1.15
3 (20)	.98	.75
Marginals:		
	A1	\$ 1.12*
	B	1.04
	SC 1	\$ 1.19
	SC 2	1.17
	SC 3	.87

* $p < .001$

TABLE 13

Mean Amount of Profit Expected In Sticking
With the First Object Rather Than Shifting
To the Second Object, With Shifting Class
And Time As Independent Variables

Shifting Class	Time	
	Questionnaire A1	Questionnaire B
1 (5-10)	\$ + .19	\$ - .44
2 (11-15)	+ .37	- .36
3 (20)	+ .38	- .11

Marginals:

A1	\$ + .31*
B	- .30
SC 1	\$ - .13
SC 2	+ .01
SC 3	+ .13

Note: A positive number reflects the profit expected in sticking, while a negative number reflects expected loss.

* $p < .001$

TABLE 14

Degree To Which Subjects Perceived Their
Questions As Logical, With Shifting Class
And Time As Independent Variables

Shifting Class	Time	
	Questionnaire A1	Questionnaire B
1 (5-10)	3.29	3.71
2 (11-15)	2.70	3.57
3 (20)	3.41	4.41

Marginals:

A1	3.13*
B	3.90
SC 1	3.50
SC 2	3.13
SC 3	3.91

Note: The greater the number, the more illogical the questions.

* $p < .001$

although SC 1 did differ from SC 2 on the first administration of Questionnaire A (A1) at $p < .10$ ($t = 1.71$, 56df, two-tailed).

Figure 8 graphs mean amounts of money subjects in each class expected to win by successfully identifying the first object. No comparisons across classes were significant even at the .10 level. However, on Questionnaire B, a significant difference ($p < .01$) was found between the gains subjects in SC 1 and SC 3 believed they would experience by shifting to the second object rather than continuing on with the first (Figure 9, $t = 3.53$, 78df, two-tailed). Thus, Ss who shifted after the fifth and before the tenth question thought they would win significantly more by shifting than did those who did not shift at all. The direction of this difference was the same at time A1, but only at the .10 level ($t = 1.73$, 78df, two-tailed, SC 1 and SC 2 combined).

Each S's profit score was computed by subtracting the gain he expected to receive as a consequence of shifting from the gain he anticipated receiving if he continued with the first object. Plotting mean profit scores, as was done in Figure 10, revealed a significant difference between the combined means of SC 2 and 3, and SC 1 at A1 ($t = 2.09$, 78df, $p < .05$, two-tailed). In other words, relative to the average of the other two groups, those shifting early in their questioning expected to gain little by sticking with the first object. On Questionnaire B the direction of these differences was the same, but not significant ($p < .10$ for the difference between SC 1 and SC 3, $t = 1.95$, 55df).

As for the degree of logic characterizing their questions, SC 3 felt, after asking twenty questions, that, on the average, their questions were significantly less logical than the mean of the other two

groups ($t = 2.19$, 78df, $p < .05$, two-tailed). As can be seen in Figure 11, the direction of this difference prevailed from the very beginning: those who never shifted during the course of their questioning tended to feel that their first five questions were less logical than those shifting after eleven to fifteen questions ($t = 1.94$, 43df, $p < .10$, two-tailed).

Insert Figures 7 - 11 about here

Visual inspection of Figures 7-11 suggests that shifting groups did differ with respect to certain cognitive variables at time A1. For example, early shifters (SC 1) reported lower probabilities of identifying object one and anticipated less profit would accrue by persisting with that object. And at time B, subjects who never shifted appear to feel there was, in fact, less to be gained by shifting, and anticipated greater absolute payoff from identifying object one than did those who had shifted. But these visual impressions, and the t tests reported above, cannot be construed to represent firm findings; the analyses of variance failed to reveal significant main effects of shifting groups or significant interactions of time and shifting groups. Perhaps larger n 's would have permitted differences which are visually apparent and seemingly logical to become statistically significant.

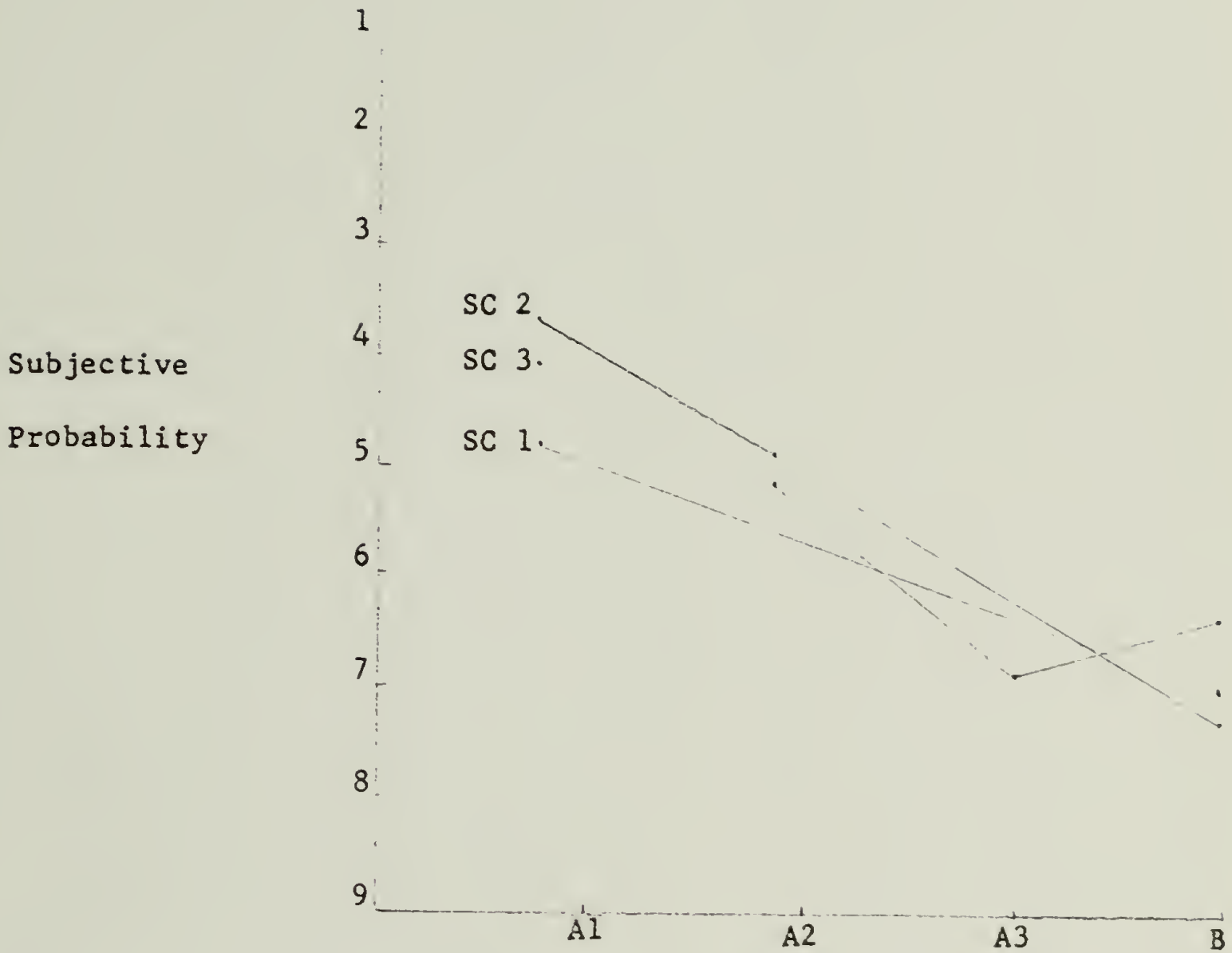


Fig. 7. Mean subjective probabilities that S will successfully identify first object as a function of questionnaire administration with shifting classification as a parameter.

(Note: the smaller the number, the greater the subjective probability)

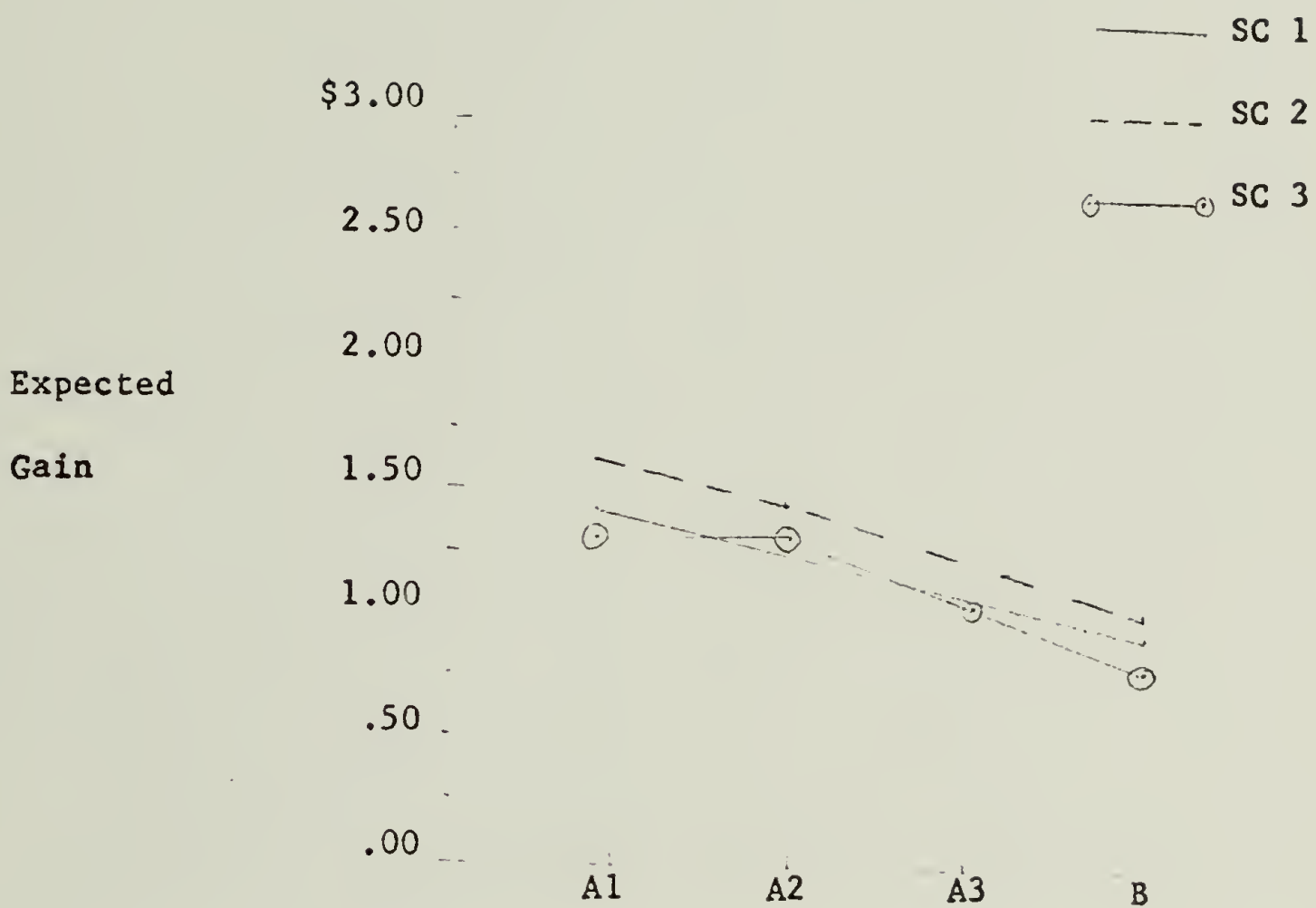


Fig. 8. Mean expected gain associated with successful identification of first objects as a function of questionnaire administration with shifting classification as a parameter.

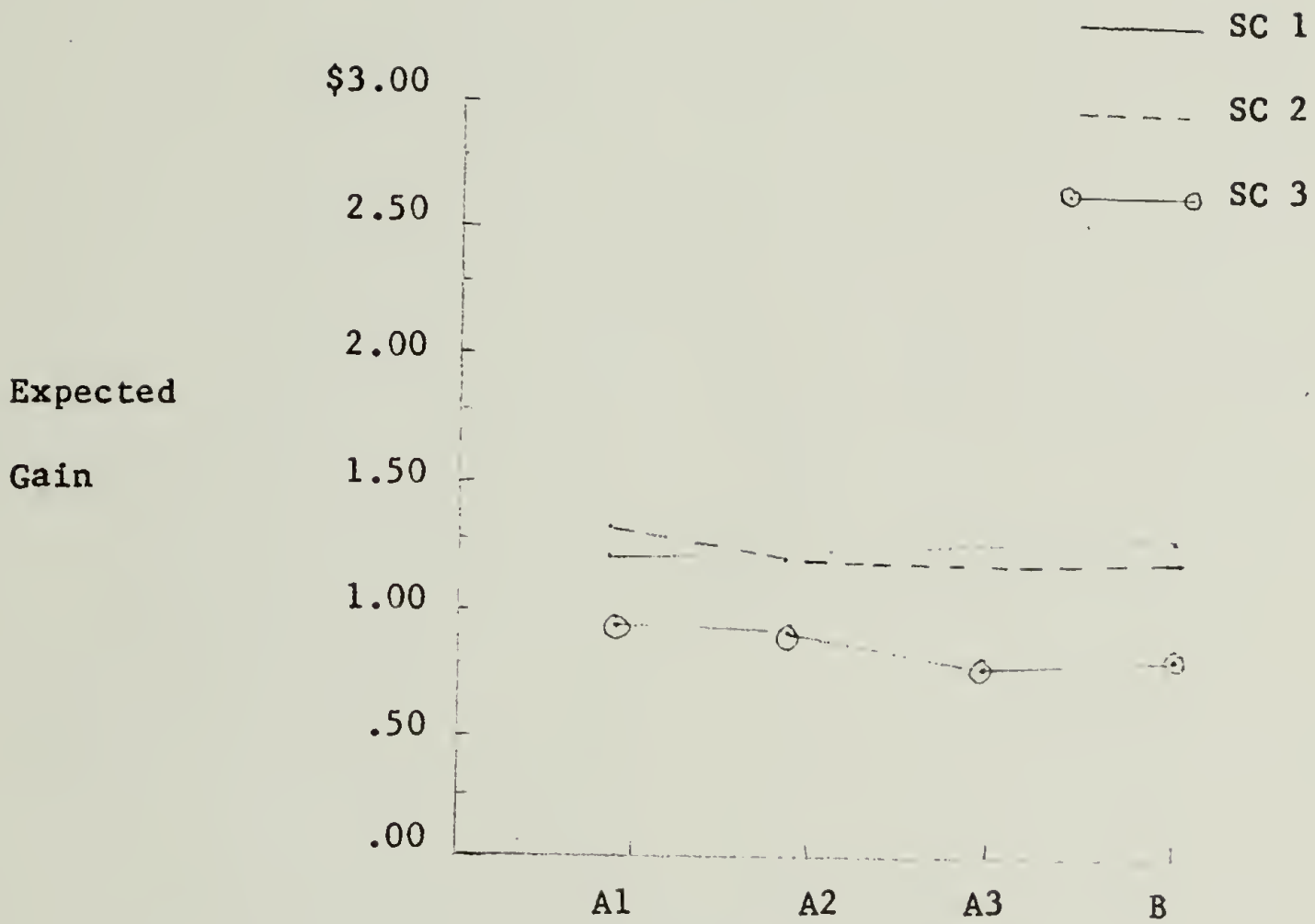


Fig. 9. Mean gain expected if S had shifted to second object as a function of questionnaire administration with shifting classification as a parameter.

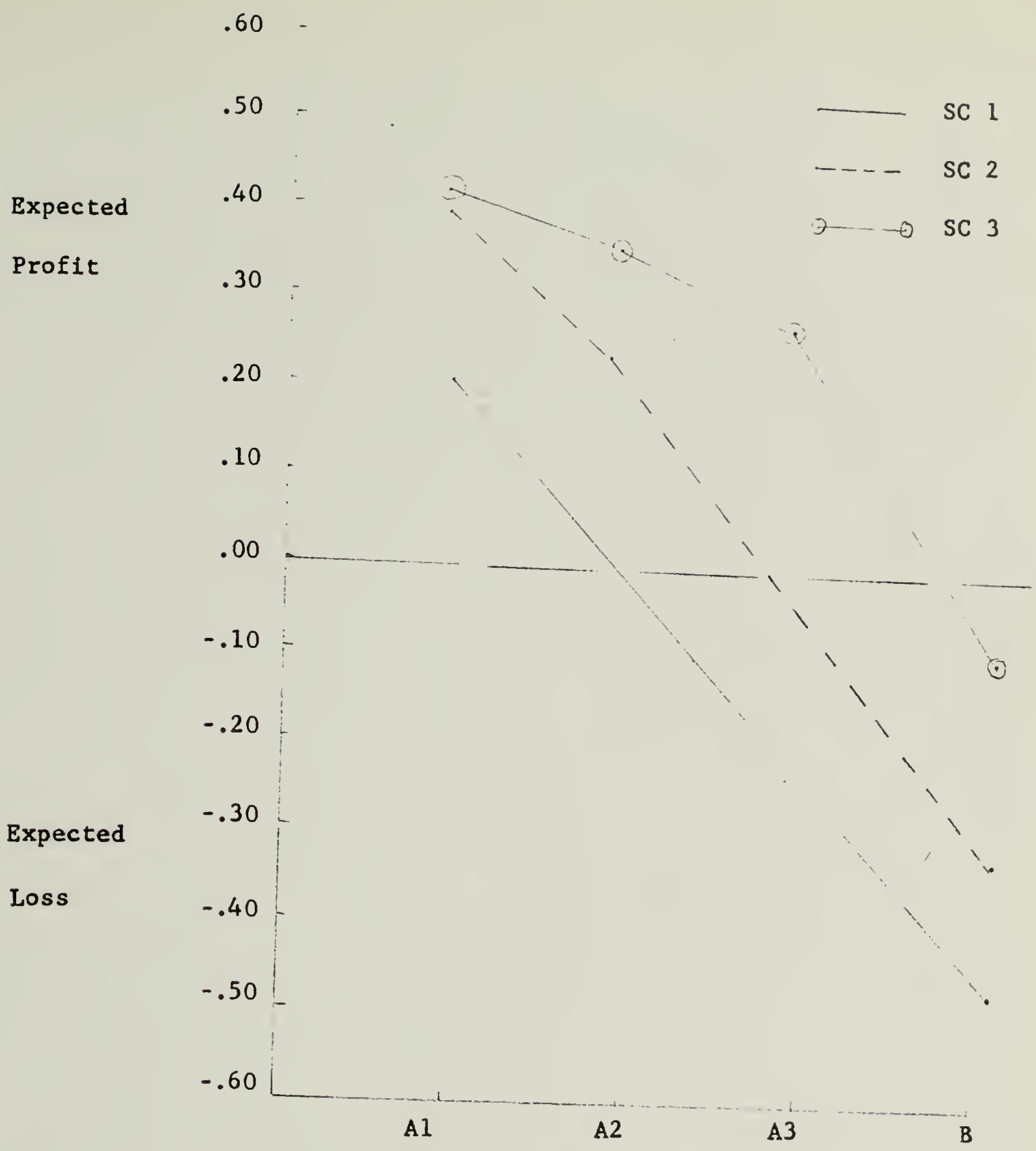


Fig. 10. Mean profit (loss) expected in sticking with the first object rather than shifting to the second object, plotted as a function of questionnaire administration with shifting classification as a parameter.

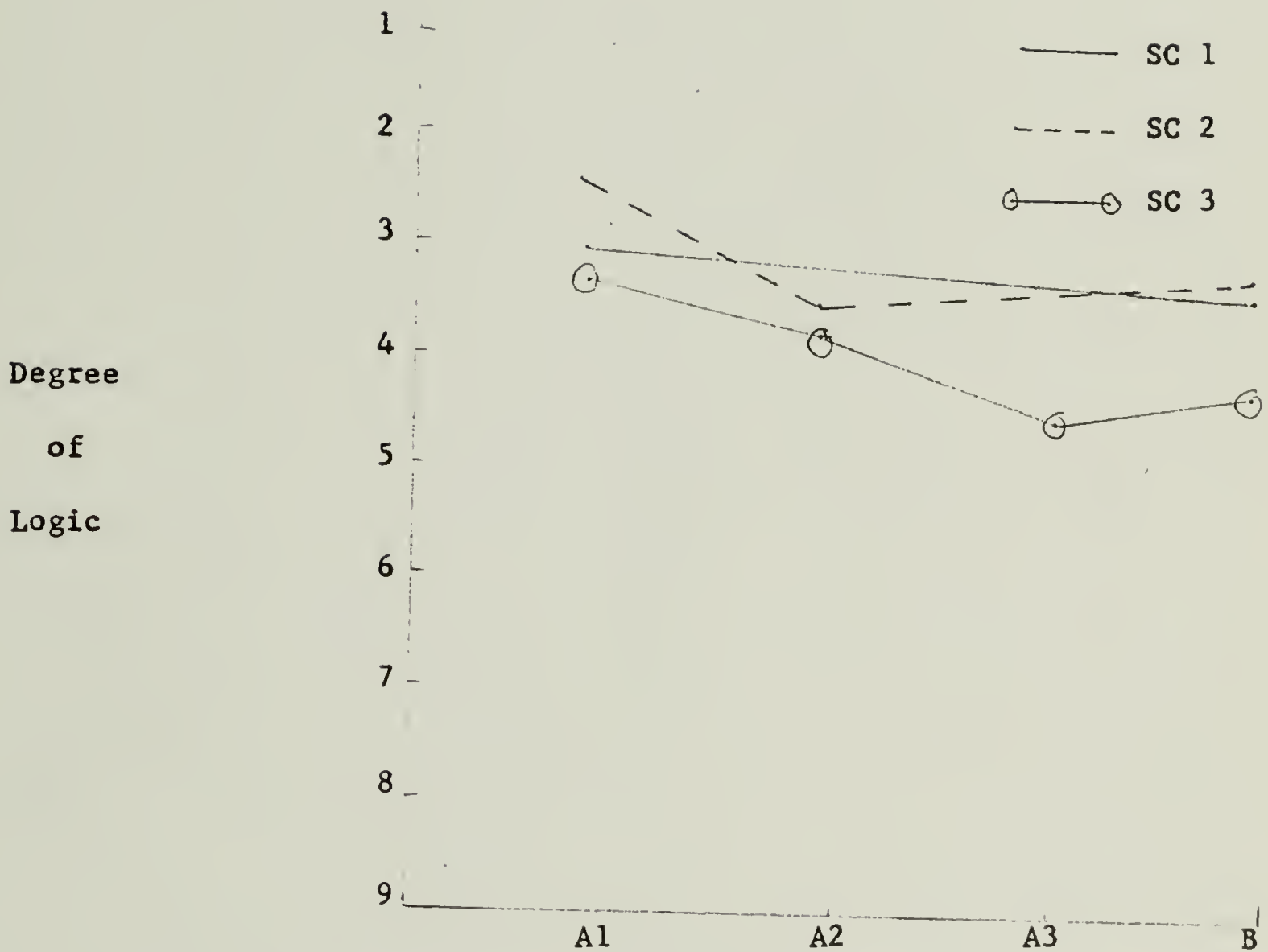


Fig. 11. Mean degree to which Ss perceived their questions as logical plotted as a function of questionnaire administration with shifting classification as a parameter.

(Note: the smaller the number, the greater the logic perceived.)

Discussion

The manipulations of this study failed to have the anticipated effects on subjects' persistence in asking questions concerning object one. Whether the subject had seemingly chosen object one or had been assigned to it did not affect persistence, nor did the retrievability of the costs subjects had incurred. Moreover, although magnitude of incurred costs had a significant effect on commitment, results were opposite to those predicted in that subjects losing ten cents for failing to identify the initial object with their first five questions tended to ask a greater number of total questions than did those experiencing the sixty-cent loss. It is possible, of course, that the theory underlying the predictions is wrong. But when a theory rather closely parallels anecdotal evidence and everyday experience, disconfirmation may mean that the theory has not been adequately tested.

It will be remembered from our shifting-class analysis that all subjects, regardless of shifting classification, tended to share initial and terminal cognitions (e.g., subjective probabilities, profit). Further, since pre-shift changes in these cognitions were equal across such groupings of subjects, the major difference between shifting classes became the number of questions required for such cognitive changes to occur. For example, all subjects tended to share the same subjective probabilities associated with successful identification of the first object, both after asking their first five questions and after shift, post-shift probabilities being significantly lower than those initially held. The decrement in probability manifested by early shifters, although equal

Discussion

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to that of the other two groups, occurred more rapidly than for subjects who persisted in asking questions. Thus, the data suggest that shifting occurred after a sufficiently low level of expectation had been reached, a point at which some subjects arrived more quickly than others.

Relevant to the above discussion may be Steiner's concept of outcome freedom. According to Steiner (1970) outcome freedom, in referring to the degree to which a person perceives himself as able to obtain desirable outcomes, varies directly with the expected gain associated with outcome achievement. Expected gain equals outcome valence times the subjective probability of outcome attainment, minus any cost incurred during goal pursuit. Consequently, outcome freedom is held to be positively related to valence and subjective probability and negatively related to costs incurred. However, these components of expected gain need not be orthogonal. For example, in some situations, individuals will invest prized resources during goal pursuit because such investment is seen as instrumental to goal achievement. Under these conditions, outcome freedom will increase in expenditure. On the other hand, in some situations, investment and subjective probability of outcome achievement are thought to be unrelated. Further expenditures, therefore, rather than increasing one's expected gain through subjective probability increments, only serve to restrict outcome freedom. Thus, when a perception of zero correlation between subjective probability and investment exist, continued expenditure of prized resources may restrict the outcome freedom associated with a particular goal to a level lower than that associated with alternative outcomes. When such low levels

of outcome freedom obtain, shifting to a more attractive alternative should result.

Applying this line of reasoning to the shifting class analysis, it seems plausible that shifting to the alternative object followed relatively severe restrictions on perceived outcome freedom, restrictions resulting from the perception of zero correlation between subjective probability and incurred costs. In other words, shifting may have occurred only after 1) individuals realized that their mounting costs were no longer instrumental to the successful identification of object one, and 2) when after continued failure, the outcome freedom associated with object one decreased to a point lower than that associated with the alternative object.

Assuming that shifting did indeed involve the two-step process just described, the point at which a particular subject elected to shift may have reflected his appraisal of his game-playing ability. To further explain, the sooner the subject concluded that he was unable to play the twenty questions game (i.e., was unable to ask the right questions at the right time), the sooner he should have realized that costs no longer insured eventual success. This realization should, in turn, have resulted in decreasing subjective probability estimates, diminishing expected winnings associated with both objects one and two, and the lower expected profits revealed by our shifting class analysis (Figures 7-10). Thus, for example, high cost subjects may have attributed less game-playing ability to themselves after asking a few comparatively fruitless questions than did those experiencing the smaller initial expenditure.

Such self-attributions, occurring relatively early for those losing sixty cents, should have encouraged a realization that the correlation between costs and subjective probability was essentially zero (large costs had led to very little discernible progress). Such a realization should, in turn, have led to low level of outcome freedom associated with object one, and, consequently, to an earlier shift. However, it must be remembered that the two cost groups reported the same cognitions in response to Questionnaire A1. Consequently, the impact of the cost manipulation probably did not occur immediately following the cost manipulation.

Put otherwise, only at some later point in the course of questioning did the level of initial incurred costs differentially affect the time required for subjects to form beliefs about their inability to play the twenty questions game.

To understand the delayed effect of costs upon shift, note that responses to the first administration of Questionnaire A indicated that, overall, subjects expected to win \$1.43 upon successful identification of the first object (see Table 11), a value remarkably similar to that advertised in circulated sign-up flyers as the "average winnings" of subjects, who, it was said, had already participated in this experiment. (Average winnings were said to have been "about \$1.50.") Volunteering for experimental participation may have been a direct result of this "come-on." Thus, our subjects, upon entering the experimental situation with the prior (but false) knowledge of "average winnings," expected similar "average" levels of financial success. Combined with the likely assumption that subjects also believed that the conditions under which

they were playing the game were identical to those to which the "typical subject" was exposed, it is not surprising that few systematic differences were found on subjects' initial cognitions. Thus, regardless of any essentially irrelevant rules or regulations connected with actual game-playing, pre-experimental expectations regarding eventual monetary reward established a goal toward which subjects confidently believed themselves to be headed. (That a main effect for retrievability was found on initial estimates of money associated with successful identification of object two, and therefore, on profit, may only reflect the fact that subjects understood the retrievability rule: those for whom money was retrievable expected greater winnings in the event it became desirable to shift than did those for whom costs were forever lost. However, since both types of subjects expected to identify object one and to win approximately the amount that had been won by the average subject, and since both types tended to shift at the same point in their subsequent questioning, it seems probable that few subjects felt that a shift would become desirable. Thus the retrievability became irrelevant and ineffectual in affecting either initial perceptions or shift.)

Expectation of "average winnings" possibly rendered the cost manipulation initially irrelevant. However, exposure to repeated "no's" may have led subjects to the belief that they were going up a blind alley and that, therefore, the initially expected winnings would not be forthcoming. Such a realization may, in turn, have forced subjects to conclude that their ability to avoid blind alleys by initiating the

correct line of questioning was somewhat less than that of the "typical subject," who it was probably assumed, had identified the very object with which our subjects were having so much difficulty (since the object on which our subjects were working was perceived to be the easier of the two). Thus, in failing to perform as well as the average subject was thought to have performed, subjects may have concluded, in hindsight, that they did not extract as much information from their first five questions as was necessary to avoid blind alleys and eventual failure. Hence, one's first five questions became, for essentially the first time, a salient factor in subjects' re-evaluations of their heretofore complacent performance.

In reinterpreting their past performance, subjects may have further reasoned that the information potential of their (now perceived) crucial questions was directly related to the price placed upon them. The more expensive the question, the more information the question must potentially contain. Moreover, inability to play the game may have been perceived as directly reflected in the degree to which the assumed information potential of one's initial questions was not actualized. Hence, following the onset of continued failure, high cost subjects may have come to see themselves as less able to play the game than did their low costs counterparts since the former experienced a greater discrepancy between information thought to be potentially available.

Returning to the process by which investment affected commitment, level of initial incurred costs may have belatedly affected shift by correspondingly affecting the perceived discrepancy between information acquired and information thought to be potentially available. This

discrepancy may, in turn, have influenced the rapidity with which subjects concluded they had little game-playing ability. Thus, high initial losses, by implying large discrepancies between perceived potential information and information actually gained, eventually facilitated shift by favoring early attribution of low game-playing ability. Small losses, on the other hand, having little negative bearing on game-playing ability, delayed the development of such attributions until after the occurrence of significantly more negative feedback.

Inspection of the significant sex by cost interaction on post-shift expected winnings associated with successful identification of the first object lends partial support to the above cost-effect interpretation. This interpretation posits that cost affected commitment only when subjects, in failing to meet their personal expectation of "average" success, reinterpreted both the information potential of their initial first five questions, and their game-playing ability. Figure 3 reveals that costs had great effect on male expectations but little or no effect on female estimates. These results are consonant with the previously presented explanation since, due to the expectation of average success associated with object one, initial losses incurred by males were not seen as particularly reflective of failure or inability to achieve that which the average subject was thought to have obtained. However, triggered by the occurrence of unexpected continual failure, male subjects may have begun to reinterpret the situation and, in so doing, made inability self-attributions on the basis of the information potential assumed to be associated with initial investment. Thus, at the time of shift, high-cost male subjects, in relating high costs to low game-playing

ability, estimated lower winnings with the object from which they were shifting than did low cost males who, due to the assumed low information potential of their initial questions, had received less relevant information. Females, on the other hand, their expectation of relatively poor performance fulfilled, required no situational reanalysis, tended not to reflect upon the relationships between cost, information potential, and game-playing ability, and therefore were relatively unaffected by the cost manipulation. (That no main effect, or sex by cost interaction, was found on the amount of money associated with successful identification of the second object, a prediction derivable from the assumption that high and low cost males self-attributed different levels of game-playing ability, may simply reflect subjects' beliefs that, due to the relatively low number of remaining questions available for the identification of the more difficult object, game-playing ability and success were unrelated.)

The above explanation applies, of course, only if the assumption is made that females, from the beginning, thought themselves to be relatively unable to successfully play the twenty questions game. However, this supposition is not without some empirical support in that the data reveal that females initially tended to expect less upon successful identification of either objects one or two (Questionnaire A1, Items 3 and 6, p levels less than .10 and .05, respectively). (Although self-attribution of lower game-playing ability, assumed to be characteristic of females, did not result in their shifting earlier, this is not taken as a contradiction of our present formulation. Low ability self-attributions

probably produced lower expected gains associated with each object, but did not affect the relative difference between the two outcome freedom perceptions. Thus, although they perceived a relatively low level of outcome freedom associated with each alternative, females required as many questions as did males before the outcome freedom associated with the first object fell to the point of shift.)

In summary, it is tentatively suggested that commitment in this study was inversely related to the rapidity with which a two-step process (involving the perceptions of zero subjective probability-costs correlation and associated decrements in the perceived outcome freedom related to the initial object) occurred. It is further suggested that initial incurred costs, upon reanalysis, greatly affected the rate at which this process was concluded.

It follows from our discussion that those factors which delay the perception of zero subjective probability-costs correlation will also favor commitment. For example, crucial to our initial theory was the loss-of-face construct. Specifically, it was hypothesized that decision freedom and the incurrence of high costs, by implying post-shift loss of face, would result in the continuation of a costly course of action. However, our (albeit post hoc) analysis suggests that expected loss of face is only one of several factors which sustain perceptions of positive subjective probability-costs correlations (i.e., result in continued expectation of success in the face of defeat) and is, for that reason, commitment producing. Unfortunately, due to methodological difficulties, this research failed adequately to manipulate either decision freedom or the voluntary incurrence of high costs. It is unclear whether subjects

actually felt they had less freedom of choice when "luck" determined whether they began with the preferred object. Perhaps an experimenter who honored their preferences was seen as no more responsive to their choices than was luck which, as it turned out, also permitted them to do as they pleased. As for the cost manipulation, level of initial loss depended upon first giving Ss either a large or small sum of money and then, in effect, taking away a large or small amount. Possibly subjects did not regard the latter portion of the manipulation as a personal cost since it was automatically imposed by E and was not at all under the voluntary control of the subject. Thus, whether or not these variables affect the perceived subjective probability-costs correlations cannot here be answered.

As a final note, then, future research should employ more effective manipulations of decision freedom and voluntary incurrence of high costs, as well as attempt to minimize the countermanipulative effects of pre-experimental expectations. In retrospect, for example, it seems that a more appropriate technique for restricting decision freedom would involve the experimenter commanding the subject to begin work on that object which the subject "secretly" preferred. Allowing Ss to choose between the identification of an easier object at high costs or that of a more difficult object at low costs might also be a better operationalization of voluntary cost incurrence. Hopefully such improvements in manipulations will help to explicate the relationship of decision freedom, incurred costs, and cost retrievability to both subjective probability-costs correlation perceptions and commitment.

Summary

Employing a modified version of the Twenty Questions game, 80 male and female subjects attempted to identify either one of two objects, the initial object being either freely chosen or randomly assigned (high and low decision freedom, respectively). Subjects were supplied an initial sum of money from which deductions were made as S continually failed to identify his first object. Specifically, high cost Ss initially lost sixty cents while the low cost subjects lost only ten cents, all subjects being penalized equally thereafter. During their questioning, Ss could opt to switch to the second object, such shifting resulting in either full or zero recoupment of previous losses (high and low cost retrievability, respectively). Upon successful identification of either object, S believed he could retain that which remained in his fund. Commitment was operationally defined as the number of questions asked about the first object before shifting to the second. Although it was hypothesized that high levels of both decision freedom and costs, as well as low levels of cost retrievability, would favor commitment, only a main effect for costs, opposite to prediction, was found. Lack of predicted findings was attributed to poor operationalization of decision freedom and incurred costs, as well as to subject pre-experimental expectation. Because further analysis revealed that all subjects' perceptions of the situation tended to change in the same manner (some subjects simply requiring more time to experience these cognitive changes than others), it was tentatively hypothesized that shift was preceded by significant decreases in outcome freedom following from the perceptions of zero subjective probability-costs

correlations. Factors which might affect perceived subjective probability-costs correlations, and therefore commitment, were then discussed.

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Appendix A

Questionnaire A

We want to know your thoughts up to this point. Answer each question by either placing a checkmark on the scale or by filling in the blanks. Please answer all questions.

1. How difficult is it to think of questions regarding the identity of the object?

Very easy ___:___:___:___:___:___:___:___:___ Very difficult

2. From the information available to you so far, what do you think is the likelihood that you will be able to identify the object about which you have been asking questions?

Very likely ___:___:___:___:___:___:___:___:___ Very unlikely

3. How much of your original fund (in dollars and cents) are you likely to win if you continue asking questions about the object you started on? Give as precise a value as possible.

\$ _____

4. How logical has your line of questioning been so far?

Very logical ___:___:___:___:___:___:___:___:___ Very illogical

5. At this point, how much do you feel about continuing to ask questions about the object you started on rather than shifting to the other?

Strongly prefer ___:___:___:___:___:___:___:___:___ Strongly prefer to shift to continue

6. Bearing in mind that any costs you have incurred up to this point will be sustained (cancelled) if you shift, how much of your original fund (in dollars and cents) do you think you would win if you shifted to the other object?

\$ _____

7. From the information available to you so far, do you think the object about which you have been asking questions is the easier of the two to identify?

Definitely ___:___:___:___:___:___:___:___:___ Definitely easier harder

Appendix A (Con't)

8. How close to identifying an object do you think you are right now?

Very close _____:_____:_____:_____:_____:_____:_____:_____:_____ close
 Not at all

9. Of the two objects given, how was the particular object about which you have been asking questions selected? (Check one of the following.)

_____ Of the two, I decided with which to begin.

_____ Of the two, a random assignment dictated with which object I would begin.

Appendix B

Questionnaire B

Before beginning to ask questions about the other object, please give us your thoughts about the way things have developed so far.

1. If you had not decided to shift, what do you think is the likelihood that you would eventually have identified the first object?

Very likely ___:___:___:___:___:___:___:___:___:___ Very unlikely

2. If you had continued to ask questions about the first object, how much of your original fund (in dollars and cents) would you have won?

\$ _____

3. How logical was your line of questioning concerning the first object?

Very logical ___:___:___:___:___:___:___:___:___:___ Very illogical

4. Bearing in mind that any costs you have incurred up to this point will be sustained (cancelled), how much of your original fund (in dollars and cents) do you think you will win by identifying the second object?

\$ _____

The following items concern reasons why you did not shift earlier. Each item contains two alternatives. Please put a checkmark before the one which comes closer to representing your reasons for not shifting earlier.

- A. Once I start something I like to finish it.
 I thought I was working on the easier object.
- B. The "no answers I had received would cost me too much money.
 Having started on one object, a rapid shift might make me look silly.
- C. I had too much invested in the first object.
 Even when it looks like I can't win I don't like to admit failure.
- D. It was hard for me to accept the fact I wasn't making good progress.
 Shifting meant paying for "no" answers that wouldn't do me any good.

E. _____ I thought I'd make more money by sticking with the first object.

_____ I got personally involved in identifying the first object, and didn't want to shift even though sticking with it might cost me money.

Appendix D

Mean Responses to the First Administration of Questionnaire A

H I G H C O S T S

	MALES				FEMALES			
	HIGH FRDM	LOW FRDM	HIGH FRDM	LOW FRDM	HIGH FRDM	LOW FRDM	HIGH FRDM	LOW FRDM
	RET.	NRT.	RET.	NRT.	RET.	NRT.	RET.	NRT.
Difficulty (Item 1)	6.20	4.00	6.40	3.20	5.00	5.00	4.20	5.80
Likelihood (Item 2)	5.00	3.60	5.00	4.60	3.20	5.40	5.40	4.20
Money Expected: Object One (Item 3)	\$1.24	1.67	1.54	1.56	1.88	1.53	1.06	.88
Perceived Logic (Item 4)	2.80	3.40	3.40	1.40	3.40	2.60	2.60	3.40
Prefer Object One (Item 5)	2.80	3.00	2.80	1.60	2.00	3.20	2.60	2.60
Money Expected: Object Two (Item 6)	\$1.24	1.28	1.30	.98	1.70	1.05	1.00	.62
Profit (Item 3-Item 6)	\$.00	.39	.24	.58	.18	.48	.06	.26
Ease of Identification (Item 7)	4.40	3.20	4.00	4.40	2.60	2.80	3.40	3.00
Close to Identity (Item 8)	6.20	2.40	5.20	5.00	3.20	5.20	4.40	4.40
Decision Freedom Check	1.00	1.00	2.00	2.00	1.00	1.00	2.00	2.00

Appendix D (Con't)

Mean Responses to the First Administration of Questionnaire A

L O W C O S T S

	MALES				FEMALES			
	HIGH FRDM		LOW FRDM		HIGH FRDM		LOW FRDM	
	RET.	NRT.	RET.	NRT.	RET.	NRT.	RET.	NRT.
Difficulty (Item 1)	6.60	4.80	4.40	5.60	4.40	4.80	5.80	6.40
Likelihood (Item 2)	4.40	3.40	5.00	3.00	4.80	4.40	5.40	4.60
Money Expected: Object One (Item 3)	\$1.68	1.58	1.62	1.68	1.04	1.32	1.26	1.27
Perceived Logic (Item 4)	4.20	2.80	2.60	3.60	3.60	4.20	3.00	3.40
Prefer Object One (Item 5)	3.00	1.80	2.20	2.20	1.80	2.00	3.00	1.60
Money Expected: Object Two (Item 6)	\$1.54	1.32	1.36	1.12	.90	1.04	1.20	.44
Profit (Item 3-Item 6)	\$.14	.26	.26	.56	.14	.28	.06	.83
Ease of Identification (Item 7)	4.80	3.80	3.40	3.00	3.20	4.60	3.80	3.60
Close to Identity (Item 8)	5.20	4.00	4.20	2.80	4.20	4.80	4.60	4.60
Decision Freedom Check	1.00	1.00	2.00	2.00	1.00	1.00	2.00	2.00

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