POSTDECISION CHANGES IN THE DESIRABILITY OF ALTERNATIVES[1]

JACK W. BREHM[2]
University of Minnesota

THE importance of the choice situation is reflected in the considerable amount of theory and research on conflict. Conflict theory has generally dealt, however, with the phenomena that lead up to the choice. What happens after the choice has received little attention. The present paper is concerned with some of the consequences of making a choice.

Previous consideration of the consequences of choice have been limited to relatively unspecified hypotheses (1, 3) or to qualitative analysis (4). However, a recent theory by Festinger (2) makes possible several explicit predictions. According to this analysis of the choice situation, all cognitive elements (items of information) that favor the chosen alternative are "consonant," and all cognitive elements that favor the unchosen alternative are "dissonant" with the choice behavior. Furthermore, other things being equal, the greater the number of elements favoring the unchosen alternative (i.e., the greater the relative attractiveness of the unchosen alternative) the greater the resulting "dissonance." When "dissonance" exists, the person will attempt to eliminate or reduce it. Although space limitations preclude further discussion of the theory, it may be said that several derivations are possible concerning the consequences of making a choice. The present study was designed to test the following:

1. Choosing between two alternatives creates dissonance and a consequent pressure to reduce it. The dissonance is reduced by making the chosen alternative more desirable and the unchosen alternative less desirable after the choice than they were before it.

2. The magnitude of the dissonance and the consequent pressure to reduce it are greater the more closely the alternatives approach equal desirability.

3. Exposing a person to new relevant cognitive elements, at least some of which are consonant, facilitates the reduction of dissonance.

METHOD

In order to test these hypotheses, a procedure was required in which each subject would: (*a*) rate each of a variety of objects on desirability, (*b*) choose between two of the objects rated, and (*c*) rate the desirability of each object again. Also, the extent to which the choice alternatives approached equal desirability had to be subject to control.

These requirements were met in the following way. The *S*s were asked, in the context of consumer research, to rate the desirability of each of eight manufactured articles. As payment for taking part in the research, each *S* was given a choice between two of the rated articles. After the *S* had made his choice, and with the objects then out of sight, he was asked to rate each again. Thus a measure of change in desirability was available for the chosen and unchosen alternatives, and for articles not involved in the choice.

Design and Procedure

Subjects and rationale. The *S*s consisted of 225 female students, mostly sophomores, from elementary psychology classes at the University of Minnesota. The initial instructions were designed to convince *S* that she deserved, and would receive, payment for participating. Thus, *S* was told that: (*a*) the task was contract work for several manufacturers rather than a regular psychological experiment; (*b*) the experimenter and professor in charge were profiting substantially from the project; (*c*) the *S* herself was being asked to spend several more hours on the project; (*d*) for participation she would receive a product of one of the manufacturers.

The objects. After *S* agreed to participate, it was explained that there were eight manufactured articles, each of which was to be rated as to its desirability. Each object was then taken out of its box, briefly described, and shown to *S*.

The objects were new-looking and made by different manufacturers. They ranged in retail value from about $15 to about $30. They consisted of the following: an automatic coffee-maker, an electric sandwich grill, a silk-screen reproduction, an automatic toaster, a fluorescent desk lamp, a book of art reproductions, a stop watch, and a portable radio.

The rating scale. Objects were rated by marking a continuous line on which eight identifying points were spaced equally. These points were accompanied by written statements from "extremely desirable" to "defi-

[1] This paper is based on a thesis offered in partial fulfillment of the requirements for the Ph.D. degree at the University of Minnesota. The author wishes to thank his advisor, Dr. Leon Festinger, for his invaluable aid in the formulation and execution of the study. He also wishes to thank the Laboratory for Research in Social Relations, which supported the study.

[2] The author is now in the Department of Psychology, Yale University.

nitely not at all desirable." All eight scales appeared side by side on the same sheet.

After the eight objects had been placed on a table in front of *S*, *E* explained the rating procedure. It was stressed that desirability meant the net usefulness of the object after one had taken into consideration not only its attractiveness and quality but also how much the *S* herself needed such an article. When it was clear to *S* how to rate, she was encouraged to inspect each article carefully and to take as much time as she liked in rating. The *S*s spent from 5 to 20 minutes inspecting and rating. Most *S*s spent about 15 minutes.

The choice. When *S* had finished rating the objects, *E* explained the method of payment. He said that *S* was to get one of the eight objects she had just rated, but because *S*s would tend to choose the more attractive objects and there weren't enough to go around, the choice would be limited. In order to be fair to everyone a list of pairs of objects had been made up and each *S* was given a choice between the two objects of a pair picked at random. The *E* then pretended to look at a schedule to see which two objects *S* could choose between. In actuality, the objects offered for choice were determined by the degree of dissonance to be created, as is explained below. The *E* then told *S* which two objects she could choose between. As soon as *S* indicated her choice, the chosen object was put back in its box, the box was closed, securely tied with string, and put with whatever personal belongings *S* had with her. This routine was designed to convince *S* that she was getting the article.

The manipulation of dissonance. The two objects offered for *S*'s choice were picked in the following manner. One was always an article that had been rated fairly high in desirability, i.e., at about 5, 6, or 7 on the 8-point scale (where 8 represents "extremely desirable"). To create high dissonance (High Diss condition), the other object was always nearly as desirable as the first, i.e., only ½ to 1½ scale-points lower. For medium dissonance (Med Diss) the alternative was always about 2 scale-points lower, and for low dissonance (Low Diss) the alternative was always about 3 scale-points lower in desirability.[3] If an *S*'s ratings were such that the predetermined condition could not be created, an alternative condition was used, or, if that was not possible, the *S* was discarded.

One control condition (Gift condition) was included to determine the effect on change in desirability ratings of being given one of the objects without having to choose between two. In this condition *E* explained that to keep from running out of any one article, *S* would get one that had been randomly determined previously. As with a chosen object, the gift object was put in its box, tied with string, and put with *S*'s personal belongings. The gift item was always picked to correspond in desirability rating with the first of the choice articles, i.e., with a rating of about 5, 6, or 7 on the scale.

Providing new information. After *S*'s chosen or gift item had been put with her things, *E* explained that four of the manufacturers were interested in finding out what strikes people as being good or bad about their products. To accomplish this they had given samples of their products to an independent research organization to have an objective appraisal made of each product. The *E* then said that he wanted *S* to read the research report for each of these four products, and when she had finished he would ask her what struck her as being good or bad about each, and also which comments would be good for advertising the product. He then took four fictitious research reports from a folder and handed them to *S*. While *S* read, *E* put away the remaining seven objects.

Each "research report" was on a separate sheet and consisted of a short paragraph of supposedly factual material stating two or three good and two or three bad points about the object. For example, the report for the grill read as follows: "This grill is versatile, grills toast, sandwiches, hot dogs, frozen waffles, etc. Waffle plates may easily be attached (cord and optional waffle plates are not supplied, these require additional purchases). The grill plates may be damaged if kept heated too long (7 or 8 min.) in closed position. The heat indicator dial fluctuates, usually underestimating amount of heat. The other surface is durable, easy to clean, won't rust."

For about half the *S*s in both the High and Low Diss conditions, the four research reports included the choice alternatives, and for all other *S*s, they did not include the choice alternatives. In the Gift condition, the four research reports always included the gift item. Those conditions in which the research reports included the alternatives will be referred to as Info (Information) and the remaining will be referred to as No Info.

The second rating. After *S* had finished answering questions about the research reports, *E* said that the manufacturers were interested in finding out how evaluations of their products changed after a person had looked them over and then left the store. To do this, it was necessary to rate each object again now that *S* had looked them over and they were all out of sight. The *S* was asked to reconsider each item carefully and then rate each in the same manner as the first time. To minimize the effects of memory for the first ratings, the second rating scales were given one at a time instead of all on one sheet.

Upon completion of the second rating, the experiment was fully explained. Only two or three of all the participants showed resentment at not getting the object. With these *E* went into more detail about the reasons for designing such an experiment.

Assignment of Ss to experimental conditions. Within the limits of availability, *S*s were scheduled and assigned to the different conditions at random. Order of assignment was varied so as to cancel out differences due to change in the effectiveness of *E* with time and practice. There were 27 *S*s in each of the High Diss conditions, 33 in Low Diss—No Info, 30 in Low Diss—Info, and 30 in the Gift condition. In addition, there were 48 who chose the object initially rated lower, and were therefore eliminated from consideration.[4]

[3] Since preliminary analysis revealed no reliable differences between the Med and Low Diss conditions, they were combined and called Low Diss.

[4] Analysis of these data showed that their deletion could not account for the main experimental results. Indeed, the changes in desirability were, if anything, in the direction of reducing dissonance.

RESULTS AND DISCUSSION

Scoring the Desirability Ratings

It will be remembered that each object was rated, both before and after the choice, on a scale of desirability. These ratings were assigned numerical values corresponding to their linear position on the scale, with 1.0 representing "not at all desirable," and 8.0 representing "extremely desirable." The values were found to the closest tenth of an interval.

Any change in desirability of an object could then be found by comparing values of the first and second ratings. A difference between these values was marked positive if it indicated an increase in desirability, and negative if it indicated a decrease. However, since reduction of dissonance may be accomplished either by raising the desirability of the chosen, or lowering the desirability of the unchosen object, change in dissonance was measured by the algebraic difference in change of ratings between chosen and unchosen objects.

Since ratings are less than perfectly reliable, some of the change from first to second rating must be attributed to regression effects, which should be greater in the case of initial ratings near the ends of the scale than for those near the middle. So as to correct for regression, first and second ratings of all objects not involved in a choice (or as a gift) were correlated separately for objects for which information was given and for objects for which information was not given. Prediction equations were then used to determine the expected amount of regression for any given initial rating.[5] To estimate the true change in desirability, the expected regression was algebraically subtracted from the actual change in rating. If, for example, a person's rating of the chosen article did not change, but the expected regression was a decrease of .20, then the net change in desirability was considered an increase of .20. Rating changes altered in this manner will be referred to as *corrected rating changes*. The measure of primary interest is the Corrected Change in Dissonance. Both corrected and uncorrected mean rating changes for the chosen and unchosen objects, as well as the corrected and uncorrected Change in Dissonance, are presented in Table 1. Rating changes which were found by *t* test to be significantly different from zero are starred.

TABLE 1

MEANS OF INITIAL RATINGS, RATING CHANGES, EXPECTED REGRESSION AND CORRECTED RATING CHANGES

	N	In Choice		Not in Choice	Corrected Rating Change
		Initial rating	Rating change	Regression (*N* = 557)	
No Information					
Low dissonance					
Chosen	33	5.98	.33*	−.05	.38*
Unchosen	33	3.54	−.14	.10	−.24
Change in dissonance†			−.47	+.15	−.62*
High dissonance					
Chosen	27	6.19	.20	−.06	.26
Unchosen	27	5.23	−.66**	.00	−.66**
Change in dissonance			−.86**	+.06	−.92**
Information					
				(*N* = 534)	
Low dissonance					
Chosen	30	6.00	−.30	−.41	.11
Unchosen	30	3.47	.07	.07	.00
Change in dissonance			+.37	+.48	−.11
High dissonance					
Chosen	27	6.05	−.04	−.42	.38*
Unchosen	27	5.07	−.64**	−.23	−.41*
Change in dissonance			−.60*	+.19	−.79**
Gift condition	30	5.91	−.40**	−.40	.00

* Significantly different from zero at the .05 level.
** Significantly different from zero at the .01 level.
† A minus sign indicates decrease in dissonance.

Changes in Desirability Ratings

The effect of the amount of dissonance. According to Hypothesis 1, making a choice creates dissonance and a consequent pressure to

[5] The obtained correlation coefficients were, for objects without information, .95, and for objects with, .89. The mean rating changes were .05 and −.07, respectively. This method of estimating regression assumes that it is linear throughout the scale. Comparison of actual mean regression calculated from individual scale intervals with those obtained from the prediction equations indicates a slight flattening of regression in the lower part of the scale. However, estimates of regression for the chosen and unchosen alternatives computed from individual scale intervals yield essentially the same results as estimates obtained from the product-moment correlation.

re-evaluate the alternatives in order to reduce the dissonance. Examination of Corrected Change in Dissonance scores in Table 1 reveals a significant reduction of dissonance in all but the Low Diss-Info condition. It may also be noted that reduction of dissonance is accomplished both by raising the desirability of the chosen alternative and by lowering the desirability of the unchosen alternative.

According to Hypothesis 2, the magnitude of the dissonance and consequent pressure to reduce it is greater the more closely the alternatives approach equal desirability. Thus the reduction of dissonance should be greater in the High than in the Low Diss conditions. Data in Table 1 further indicate that in the No Info condition the Corrected Change in Dissonance for High Diss (−.92) shows greater reduction than that for Low Diss (−.62), though the difference is not statistically significant. In the Info condition the Corrected Change score for High Diss (−.79) shows greater reduction than that for Low (−.11) and is significant at the 5 per cent level of confidence. Thus, the data clearly support Hypothesis 2.

The effect of new cognitive elements. According to Hypothesis 3, exposing a person to new relevant cognitive elements, at least some of which are consonant, facilitates the reduction of dissonance. The magnitude of the reduction should therefore be greater in the Info than in the No Info condition.

It will be noted from Table 1 that the Corrected Change in Dissonance scores show no greater reduction of dissonance in the Info than in the No Info conditions. In fact, the amount in High Diss-No Info is greater than that in High Diss-Info, and similarly, that in Low Diss-No Info is greater than that in Low Diss-Info, though neither of these differences is significant. The expectation that there would be greater reduction of dissonance in the Info than in the No Info condition is, therefore, not supported.

The second expectation concerning the effect of new cognitive elements was that the difference in reduction of dissonance between High and Low Diss conditions would be greater in the Info than in the No Info condition. It will be observed in Table 1 that the difference in Corrected Change in Dissonance between High and Low Diss in the No Info condition (.30) is not significant, while the same difference in the Info condition (.68) is significant at the 5 per cent level. However, the second-order difference for the Info and No Info conditions is not statistically significant. Thus, the expectation that there would be a greater difference in reduction of dissonance between High and Low Diss conditions in the Info condition is supported only by trends in the data.

The effect of ownership. Previous studies have found that when a person is given an object he tends subsequently to see it as more desirable. This may be called the effect of ownership. The present results may perhaps be regarded as simply a reflection of this phenomenon. The Corrected Rating Changes for the *unchosen* alternative in each experimental condition provide pertinent data. It is clear that changes in desirability of the unchosen alternative are due to choice rather than ownership. In Table 1 it may be seen that the Corrected Rating Changes of the unchosen object in the Low Diss conditions are for No Info, −.24 and for Info, .00, neither of which is a significant change. For the High Diss conditions these figures are −.66 and −.41, respectively, and are statistically significant. It is therefore evident that desirability ratings of the unchosen alternative not only show a decrease, but also reflect the difference between High and Low Diss conditions in the pressure to reduce dissonance. At least this part of the present results is thus not attributable to ownership.

It still might be true, however, that part or all of the gain in desirability of the *chosen* alternative is due to ownership rather than choice. To check this possibility, some *S*s were simply given an object that corresponded in initial rating to the chosen alternative of the choice conditions. If the effect of ownership were to account for any part of the gain in desirability of the chosen alternative, then this gift object should also increase in desirability. The row labeled "Gift" in Table 1 presents the mean changes in desirability ratings for this condition. It is clear from the Corrected Rating Change of .00 that none of the gain in desirability of the chosen alternative may be attributed to the effect of ownership.

Changes in desirability and avoidance of conflict. A plausible alternative interpretation of the various desirability changes so far reported should be considered. According to this view

a person tends to avoid conflict as unpleasant. Thus, if equally desirable alternatives are offered, conflict is created, leading to attempts to reduce it. It is clear that the conflict could be reduced by changing the desirability of the alternatives in order to make them less equal in desirability. One would expect the chosen alternative to increase and the unchosen alternative to decrease in desirability. Furthermore, these changes would be proportional to the amount of conflict, which in turn would vary with the equality of desirability of the alternatives. Consequently, one would expect greater changes in the High Diss conditions than in the Low Diss conditions. The predictions are so far consistent with the obtained results.

However, there is an interesting distinction between "the consequences of avoidance of conflict" and "reduction of dissonance." The amount of dissonance is a direct function of the proportion of relevant elements which are dissonant. It follows that the amount of dissonance is limited by the proportion of relevant elements which are common to the alternatives. If all relevant elements are contained by both alternatives, no dissonance is created by a choice between them. For example, choosing between identical automobiles would create little or no dissonance. Thus it may be said that, other things being equal, the greater the amount of overlap of cognitive elements, the less is the resulting dissonance. But conflict arises from an inability to determine which alternative to choose, i.e., from approximately equal tendencies to choose both alternatives. Increasing the similarity of the choice objects will not necessarily increase a person's ability to choose between them. While conflict remains high, dissonance created by making the choice would be relatively low.

In the course of the experiment 30 *S*s were inadvertently given a choice between relatively similar objects, and the data for this type of choice were analyzed separately.[6] The choices designated as having large overlap of cognitive elements were the following: a choice between any two of the coffee-maker, the toaster, and the grill; or a choice between the art book and the silk-screen reproduction. The changes in desirability from this type of choice may then be compared with those from the regular experimental choices, which had less cognitive overlap. But first it will be pertinent to examine data relevant to the amount of conflict experienced by persons having these two types of choice.

TABLE 2

MEAN RATING CHANGES (IGNORING REGRESSION) FOR ALTERNATIVES WITH COGNITIVE OVERLAP

	No Info	Info
Low Diss		
N	8	11
Chosen	.37	−.14
Unchosen	1.26	.79
Change in dissonance†	+.89	+.93
High Diss		
N	7	4
Chosen	.59	−.70
Unchosen	.00	−.25
Change in dissonance	−.59	+.45

† A minus sign indicates decrease in dissonance.

All *S*s were asked, after the experiment was completed, if there was any conflict in making the choice, and if so, how much. Their responses were categorized by the experimenter as "none," "little," "moderate," or "high."[7] To obtain category frequencies large enough for a chi-square test, the categories were reduced to two: "none" and "some" reported conflict. It was then found that of all subjects who had a high dissonance choice, 63 per cent of those choosing between alternatives without cognitive overlap and 88 per cent of those choosing between alternatives with cognitive overlap, reported "some" conflict. This difference is significant at the 6 per cent level by chi square. Of those who had a low dissonance choice, 47 per cent of those choosing between alternatives without overlap, and 25 per cent of those choosing between alternatives with overlap, report "some" conflict. The latter relationship is in the opposite direction to the first but is not statistically significant. It may be concluded that those who choose between nearly equally desirable objects with large overlap of cognitive elements experience more conflict than those choosing between dissimilar

[6] The author is indebted to Dr. Festinger, who first noted this difference.

[7] The classification by *E*, who knew whether or not the alternatives were nearly equal in desirability, may well be biased in respect to the High versus Low Diss manipulation. However, *E* did not expect to separate out choices involving cognitive overlap so there is no reason to suspect a bias in regard to this variable.

objects. If the changes in desirability in this experiment are due to avoidance of conflict, then, one would expect *greater* changes where the alternatives are similar. On the other hand, if the changes are due to a pressure to reduce dissonance, one would expect them to be *less* where the alternatives are similar.

In Table 2 may be found the uncorrected mean changes in desirability ratings for the chosen and unchosen alternatives which had cognitive overlap. These may be compared with the uncorrected rating changes in Table 1. Corrections for regression are not necessary since the important comparisons are between the two High Diss conditions and between the two Low Diss conditions. It will be seen that the changes in the direction of reducing dissonance (or avoiding conflict) are small or nonexistent. For all those with a high dissonance choice, 27 per cent of those choosing between similar and 59 per cent of those choosing between dissimilar alternatives show rating changes in the direction of reducing dissonance or avoiding conflict. This difference is significant, by an exact test, at the 11 per cent level. There is thus some evidence that choices between alternatives with overlapping cognitive elements create less tendency to change the desirability of the alternatives in the expected direction. Since it has already been seen that such choices are accompanied by more, rather than less, conflict, it appears that these changes in desirability reflect reduction of dissonance rather than avoidance of conflict.

SUMMARY AND CONCLUSIONS

The present experiment was designed to examine some of the consequences of making a decision. Specific predictions about the consequences were based on a theory by Festinger. According to this theory, when a person chooses one of two alternatives, all of the items of information which favor the unchosen alternative will be dissonant. Thus a state of dissonance and pressure to reduce it are created. Examination of the possible ways in which dissonance may be reduced was limited in the present study to tendencies to re-evaluate the choice alternatives after the decision.

Female *S*s were asked to rate each of eight articles on desirability, choose between two of them, and then rate each of the articles again. In addition, some *S*s were exposed to a mixture of good and bad information about the choice alternatives after the choice was made.

The results supported the prediction that choosing between alternatives would create dissonance and attempts to reduce it by making the chosen alternative more desirable and the unchosen alternative less desirable. A second prediction, that dissonance and consequent attempts to reduce it would be greater the more nearly the choice alternatives approached equality, also received support. The third prediction, that exposure to new information containing at least some consonant elements would facilitate reducing dissonance, did not receive clear support. A control condition ruled out the possibility that the obtained increase in desirability of the chosen alternative was due to ownership. Finally, some of the data consistent with "dissonance theory" were found not to be consistent with traditional "conflict theory."

REFERENCES

1. ADAMS, D. K. Conflict and integration. *J. Pers.*, 1954, **22**, 548–556.
2. FESTINGER, L. The relation between cognition and action. Paper read at Symposium on Cognition, Boulder, Colo., May, 1955.
3. LEWIN, K. *Field theory in social science.* New York: Harper, 1951.
4. MARTIN, A. H. An experimental study of the factors and types of voluntary choice. *Arch. Psychol.*, 1922, **22**, No. 51.

Received July 15, 1955.