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Burton G. Andreas
State University of Iowa

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Motor Responses as a Function of Type of Conflict

By BURTON G. ANDREAS

Introduction

In his introduction to a discussion of experimental studies of conflict, Neal E. Miller (2) states that "conflict is produced by competition between incompatible responses." He goes on to say, however, that such response phenomena as hesitation, vacillation, or complete blocking are not found in all situations where there are competing response tendencies. The extent to which they appear is a function of the type of conflict situation.

Using human subjects in a series of experiments on motor conflict, Hovland and Sears (1) confirmed this prediction from theory. These investigators studied the effects of two types of conflict — double-approach and double-avoidance. They found that the distribution of responses, when classified into categories on the basis of observable characteristics, was different for the two conflict situations. In the study to be reported, certain of the procedures used by Hovland and Sears were repeated, in essential aspects, preparatory to a systematic investigation of the effects of practice and motivation upon conflict behavior in human subjects. This paper makes a comparison of the Hovland and Sears results with those of the present experiment, with respect to double-approach and double-avoidance conflict behavior.

Apparatus and Procedure

The apparatus used in the present study is modeled after one described by Siipola (3). It consists of a handle that can be moved freely from a starting point to any one of 13 target positions located in a semicircle at a radius of ten inches from the starting point. Above each target position is a green panel light. The flashing on of one of these lights was the stimulus designating the target to which the handle was to be moved. Under the approach condition, the subject was instructed to move the handle as quickly as possible *toward* the green light that flashed on. Only the lights at the extreme left or right of the starting point were used in this experiment. Twenty training trials were given with one or the other of the stimulus lights presented on each trial. Trials to the right were irregularly alternated with trials to the left. On Trial 21, an approach-approach conflict situation was set up by presenting both stimulus lights simultaneously. Additional training and conflict

trials were given, but this paper deals only with the results on the first conflict trial so that the data reported here are comparable to those obtained by Hovland and Sears. In the avoidance-avoidance condition of the present study, procedures were identical with those used in the approach-approach condition, except that the subjects were instructed to move in the *opposite direction* from the green stimulus light that flashed on. Forty-eight subjects were tested in the approach situation and 48 were tested under the avoidance-avoidance condition.

Results

The results are shown in the following table.

PER CENT OF RESPONSES IN DIFFERENT CATEGORIES AS A FUNCTION OF TYPE OF CONFLICT

		- <u>RESPONSE CATEGORY</u> -					
PRESENT STUDY	<u>TYPE OF CONFLICT</u>	<u>SINGLE</u>	<u>DOUBLE</u>	<u>COMPROMISE</u>	<u>BLOCK</u>	<u>PARTIAL</u>	<u>REVERSAL</u>
		APPROACH	71	27	0	0	0
	AVOIDANCE	44	6	2	29	15	4

H-S STUDY	APPROACH	57.50	21.25	12.50	8.75	--	--
	AVOIDANCE	17.50	7.50	28.75	46.25	--	--

The results of both studies are in agreement in showing that when conflict is of the avoidance type, as contrasted with the approach type, the per cent of "Single" and "Double" responses is smaller while the per cent of "Compromise" and "Block" responses is greater. In the "Single" response, the subject moves the handle to just one of the two positions to which he has received training. This type of response was most frequent in both types of conflict in the present study. In the Hovland and Sears study it occurred over half of the time under the approach condition, but less than twenty per cent of the time under the avoidance condition.

The "Double" response is one in which the subject moves successively to each of the two positions on a single conflict trial. This type of response ranked second in frequency of occurrence in the

approach situation, but in both studies it appeared much less often in avoidance conflict.

In the Hovland and Sears experiments, the lesser frequency of "Single" and "Double" responses under the avoidance condition was accompanied by a greater frequency in both the "Compromise" and "Block" responses. The "Compromise" response is one in which the subject moves straight forward to a point between the two positions to which training was given. In the "Block" response the subject makes no overt movement from the starting point.

In the present study, the per cent of occurrence of the "Block" type of response was also significantly greater when the conflict situation was of the avoidance type. However, "Compromise" reactions were found in only one subject in the avoidance situation and not at all in the approach condition.

In the present study, it may also be seen that there was a difference in the frequency of "Partial" and "Reversal" responses. The "Partial" response is one in which the subject moves a short distance from the starting point and then returns to it. This sort of reaction did not occur in the approach situation, but it was the response made by 15 per cent of the subjects in double-avoidance conflict. In the "Reversal" response, the subject first moves in one direction, then reverses direction and goes to a target on the side opposite the original movement. Responses of this category appeared infrequently, but were observed more often in the avoidance situation than in the double-approach conflict.

Hovland and Sears do not use the "Partial" and "Reversal" categories in classifying the responses in their study. The "Partial" type of response would probably be shown as "Block" responses in their classification. If the 15 per cent "Partial" responses were classified as the "Block" type in the present study, it may be seen from the table that the resultant figure, 44 per cent, would closely approximate the 46.25 per cent found by Hovland and Sears for the "Block" type of response under avoidance conflict.

Discussion

The fundamental principles of conflict outlined by Miller (2) give rise to predictions that were confirmed in the study by Hovland and Sears and that are confirmed again in the present study. The first of these principles is the *approach gradient*. This is the postulate that the tendency to approach a goal is stronger the nearer the subject is to the goal. The second principle deals with the *avoidance gradient*. This is the principle that the tendency to avoid a stimulus is stronger the nearer a subject is to the stimulus.

In the approach-approach conflict situation, there are two hypothetical approach gradients, giving rise to an unstable equilibrium. As soon as the subject starts toward one goal, the tendency to approach it increases, in accordance with the gradient principle, and the initiated response is carried through to completion. The approach gradient principle, then, leads to the prediction that there will be few responses of the "Block" or "Partial" or "Reversal" types in the approach-approach situation. In the Hovland and Sears study this prediction is confirmed by the occurrence of only 8.75 per cent of "Block" responses under double-approach conflict. The prediction is also substantiated by results of the present study in which a "Reversal" response was made by a single subject in the approach condition. In this condition no "Block" or "Partial" response occurred.

In the other type of conflict, the two theoretical avoidance gradients set up a condition of stable equilibrium. This leads to the prediction that there will be a preponderance of responses of the "Block" or "Partial" or "Reversal" types in double-avoidance conflict. It may be seen from the table that in both studies almost fifty per cent of the responses under avoidance conflict did fall into these three categories. However, there are a large number of cases in which the subject did move to one or both of the target positions. It is possible that these responses are the result of approach tendencies established during the training phase of the experiment even though the situation is ostensibly one of double avoidance. Hovland and Sears have pointed out that the movement by which the subject avoids one position in training is actually an approach to the other position. Every response may be regarded as an approach or avoidance movement. The subjects in the present study were told that their score would depend on how quickly they moved to a target position. It is therefore reasonable to suppose that a strong approach tendency was set up initially and was reinforced in training. It is this approach tendency, present in both experiments, which is considered to account for the occurrence of complete movements to a target in this so-called avoidance-avoidance situation.

The greatest difference between the results of these two studies is in the frequency of occurrence of "Compromise" responses. This difference may be explained in terms of generalization and the summation of generalized tendencies. In both studies the apparatus was designed to permit motor responses other than those on which training was given. In the Hovland and Sears study the movements

which were trained were 45 degrees to the right or to the left. In the present study they were 90 degrees to the right or left or in exactly opposite directions. In the present experiment there actually were 13 target positions arranged in a semicircle, although only the lights corresponding to the end targets were lighted in training or in conflict testing. As training progressed, it may be assumed that there were developed generalized tendencies to make responses other than the ones being trained. The generalization gradients might overlap at intermediate positions to give summated generalized tendencies to movement. These summated tendencies would be stronger in the Hovland and Sears study than in the present experiment since their training points were closer together. This would account for the occurrence of a substantial number of "Compromise" responses in their results while almost none were found in the present study.

SUMMARY

The results reported in this paper are in general agreement with the results obtained by Hovland and Sears. Both studies substantiate certain predictions from conflict theory as outlined by Miller. The major discrepancies in the results of the two investigations can be accounted for by differences in experimental procedure. For the approach-approach and avoidance-avoidance situations, the empirical evidence is that the motor responses made are a function of the type of conflict.

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DEPARTMENT OF PSYCHOLOGY
STATE UNIVERSITY OF IOWA