EFFECTS OF REWARD ON REINFORCEMENT VALUE AND EXPECTANCY STATEMENTS FOR INTERNAL AND EXTERNAL SUBJECTS IN SKILL AND CHANCE SITUATIONS

by

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INTRODUCTION

Tolman's (1938) explanation of the rat's maze behavior in terms of expectancy of goal attainment and demand for goal is one of the few conceptual schemes developed in the animal laboratory that has found application in the study of human behavior. In the process of this application, "expectancy of goal attainment" was termed expectancy and "demand for goal" was called reinforcement value. In recent years there has been considerable research concerning the relationship that may or may not exist between these two variables and their role in determining behavior. Lewin, Dembo, Festinger, and Sears (1944) studied this relationship and its effects on level of aspiration and general decision-making. Edwards (1955) used them in the context of economic decisions. And, most recently, Atkinson (1957) and Rotter (1954) have used expectancy and reinforcement value concepts in the study of achievement-oriented behavior and social learning, respectively.

The present study represents an attempt to further clarify the relationship between expectancy and reinforcement value. The framework for this investigation was provided by Rotter's (1954) social learning theory. One of the basic assumptions of this theory is that behavior potential is a function of expectancy and reinforcement value. Expectancy is defined as "...the probability held by the individual that a particular reinforcement will occur as a function of a specific behavior on his part in a specific situation or situations" (Rotter, 1954, p. 107).

"The reinforcement value of any external reinforcement may be ideally defined as the degree of preference for any reinforcement to occur if the possibilities of their occurring were all equal" (Rotter, 1954, p. 107). Basically, Rotter assumes that expectancy and reinforcement value are independent, although he states that under certain specific conditions a relationship between them may develop based on the learning history of the individual. Empirical support for the assumption of independence was found by Edwards (1955) in his study of economic decisions. On the other hand, studies of decision-making under conditions of uncertainty have led Atkinson (1957) and Feather (1959) to the conclusion that expectancy and reinforcement value are interrelated.

A possible clarification of these differences was offered by Worell (1956). He makes a distinction between achievement and non-achievement situations. In the achievement situation, performance is seen by the subject as being dependent upon his skill and thus there is an implicit challenge to his competency. Therefore, expectancy statements may remain unchanged or even be lowered in a defensive fashion so as to mitigate any potential negative reinforcement. In non-achievement situations no such challenge is offered to the S's competency, and the element of wishfulness may even come to play a prominent role. This might be exemplified by so-called chance situations.

Worell's explanation is supported by Phares' (1965) review of the literature which suggests that many of the studies indicating an increase in expectancy with an increase in the value of

the goal used experimental situations involving gambling-luck factors, while studies showing no increase in expectancy with an increase in the value of the goal tended to use experimental situations involving skill or achievement factors. It is conceivable, then, that the view stressing the independence of expectancy and reinforcement value is as correct as the view which stresses their relationship. If this is the case, the basic problem is one of identifying the situational variables that might affect the degree of the relationship, rather than attempting to show in any definitive fashion whether or not there is a relationship.

The skill-chance dichotomy is one such situational variable studied by Phares (1965). Using Worell's argument, he reasoned that following a success experience, the introduction of reward in a skill situation should produce a decrement in expectancy, while in a non-reward situation an increment in expectancy should occur. In a chance situation, however, he predicted that there would be no difference in expectancy changes between reward and non-reward conditions following the introduction of reward. The former prediction was supported; however, the latter was not.

Since similar changes occurred in both the skill and chance situations, Phares hypothesized, post hoc, that, although expectancy was consistently higher in the skill condition than in the chance situation, Ss tended to perceive the chance situation as partially controlled by skill factors. Phares' use of a modified form of the Stromberg Dexterity Test (1947) could have been responsible for the failure of Ss to perceive the chance situation

as primarily controlled by chance factors. The object of the task was to replace small, colored blocks into the correspondingly colored sections of a board as quickly as possible. It would seem that this was inherently a skill situation. Thus it is probable that the use of instructional set to manipulate the nature of the task as either skill or chance was not effective for the chance groups in this situation.

Another concept from Rotter's social learning theory that may be relevant to the identification of variables that influence the relationship between expectancy and reinforcement value is the internal-external (I-E) personality dimension (Rotter, 1966). Specifically, the I-E dimension refers to the degree to which the individual perceives reinforcements to be contingent upon his own behavior versus the degree to which he feels that the occurrences of rewards are due to forces outside himself, and consequently are independent of his own actions. In short, I-E is considered to be a general personality factor that cuts across need areas such as independence, love and affection, recognition-status, protection-dependency, and physical comfort.

The first attempt to objectively measure individual differences in a generalized expectancy for either internal or external control was made by Phares (1957). Since then, the scale has evolved into a 29-item forced-choice test with 23 I-E items and 6 filler items (Rotter, 1966). A sample item is as follows (see Appendix A for the entire scale):

a. In my case getting what I want has little or nothing to do with luck.

b. Many times we might as well decide what to do by flip-

ping a coin.

S's score on this test is simply the total number of "internal choices" made by the individual. The typical mean for a college population is approximately 14.5 with a median of about 15.0 (Rotter, 1966).

Early investigations with the I-E scale have shown that internally controlled individuals are more likely to take social action to better their conditions (Gore and Rotter, 1963), are more likely to learn and remember information relevant to their future goals (Seeman, 1963; Seeman and Evans, 1962), and are more concerned with their ability, particularly with their failures (Efran, 1964).

More recently, Rotter and Mulry (1965) studied the potential differences in the value or importance placed upon different kinds of reinforcements by individuals who could be characterized as either internal or external in their generalized expectancy. Rotter and Mulry used an angle-matching task with two instructional sets which served to structure the nature of the task as either skill or chance. Using reaction time as the dependent variable, Rotter and Mulry predicted that internally controlled Ss would take longer to make a discrimination in a skill as opposed to a chance situation since internals would place a higher value on the achievement of reward in a skill situation. Correspondingly, they predicted that the external individual would show longer decision times in the chance situation since he would be primarily concerned with whether or not he was a lucky or an unlucky person. Both of these predictions were confirmed. The data

also indicated that the overall mean decision time in the skill situation was higher than the mean decision time in the chance situation. Inasmuch as expectancy was controlled in this study, it would seem that individuals who can be characterized as either internals or externals do show differences in the value or importance they place on different kinds of reinforcements. Of course, this assumes the validity of decision time as a measure of reinforcement value.

The present study was designed to include the I-E dimension in a partial replication of Phares' (1965) study concerning the effect of reward introduction and the resulting changes in expectancy in both skill and chance situations. Two other changes were also made. First, an ambiguous situation, i.e. a situation unstructured in the sense that specific skill-chance instructions were not given to Ss, was added to permit a more precise analysis across a continuum of situations. Second, a task requiring female Ss to predict a child's responses to a children's personality test was used as a more novel task. The novelty of the task served two potential functions: first, it was hoped that it would avoid the inherent skill nature of the Stromberg Dexterity Test; second, since internal and external control are presumed to be generalized expectancies relatively nonspecific to any given situation, the novelty of the task might also reduce the likelihood that any expectancies specific to the situation through prior experience would contaminate the more general expectancy for either internal or external control. In addition, two reward trials were used instead of one in order to allow a

more extensive analysis of expectancy changes.

Since Rotter and Mulry (1965) found that decision time was not influenced by expectancy for success, and previous research by Barker (1946) and Lotsof (1956) indicated that decision time increased with the importance of the reinforcement when expectancy was held constant, it was concluded that expectancy and decision time were independent measures. Therefore, in the current study both expectancy and reinforcement value (as measured by decision time) were studied as they relate to: 1) the I-E dimension, 2) skill, chance, and ambiguous situations, and 3) the introduction of extrinsic reward.

The specific predictions, based on the previous studies and analyses were as follows:

I. Following success in a skill situation, introduction of reward will result in a decrement in expectancy for success, while in a non-reward skill situation there will be a corresponding increment. In reward and non-reward chance situations, however, there will be no differences in expectancy statements; that is, little change will occur in either the reward or non-reward conditions. This prediction follows directly from Worell's (1956) suggestion that skill or achievement situations present a challenge to S's competency and may result in lowered expectancies in order to mitigate the possibility of failure. Conversely, the chance or non-achievement situation offers no such challenge to S's competency and therefore the introduction of reward should not result in a lowered expectancy. Therefore,

it is predicted that for the two trials in which the reward - non-reward condition is introduced, the expectancy statements will show an interaction between the situation and reward - non-reward.

II. Following introduction of reward in a skill situation, there will be an increment in decision time as compared to a non-reward skill situation. A similar outcome will follow in comparable chance situations. However, differences in decision time between reward and non-reward conditions will be greater under skill conditions than under chance conditions. This predicted interaction is based on the assumption that the attainment of an extrinsic reward in a skill situation is more valued than a comparable reward received in a chance situation because it is linked to intrinsic rewards such as achievement, competence, etc. Thus it is predicted that the analysis of the decision time data will show a situation X reward - non-reward interaction.

III. a. Since internals value the demonstration of skill, they should show longer decision times in the skill situation than in the chance situation prior to the introduction of reward. Likewise, internals should feel that expectancies for future reinforcement can be based on past experience in skill situations but not in chance situations. Thus, they should also show higher expectancies for success (in a positively reinforced trial sequence) in a skill situation than in a chance situation prior to the introduction of reward.

b. Since externals tend to be concerned with whether

or not they are lucky persons, comparable outcomes are expected for externally controlled individuals in chance situations prior to the introduction of reward. That is, positive reinforcement in a chance situation should tend to reinforce the external's view that he is indeed lucky and thus his expectancies should rise accordingly following positive reinforcement. However, in a skill situation positive reinforcement should have a lesser effect on expectancies. Finally, decision times should be greater for externals in the chance situation since they presumably place more value on the occurrence of chance rewards.

If the reasoning of both parts of this prediction is correct, a situation X internal-external control interaction in the expectancy and decision time data should be seen for the trials prior to the introduction of reward.

IV. The specific reaction time and expectancy predictions following the introduction of reward for the internal and external groups are summarized in Table I, relative to the appropriate non-reward controls. The decision time predictions stem directly from the findings of Rotter and Mulry. Although Rotter and Mulry did not include an ambiguous situation, it is assumed that Ss will, in the absence of explicit cues to the contrary, structure ambiguous situations in the light of their generalized expectancies for internal-external control. Thus, internals will structure the ambiguous situation as an internally controlled or skill situation, while externals will impose an externally controlled or chance structure.

The expectancy predictions are based on an elaboration of Worell's (1956) explanation of expectancy statements in skill situations. Briefly, internals are expected to have lower expectancies than externals following the introduction of reward in the skill situation because of their skill oriented generalized expectancy. This generalized expectancy toward skill should make them more defensive than externals who have a chance oriented generalized expectancy and who thus will not be subject to the same defensive reactions. The same reasoning applied to the chance situation leads to the prediction that externals will be more defensive than internals since externally oriented individuals are primarily concerned with whether or not they are lucky. In short, both internal and external Ss will react defensively and thus lower their expectancies when they attach a high value to a situation where failure would lead to possible strong negative reinforcement. On the basis of this reasoning both the expectancy and decision time data should show a second order interaction between the situation, the reward - non-reward condition, and internal-external control for the two trials in which the reward - non-reward condition is introduced.

Table I

I-E Predictions Following Introduction of Reward in Skill, Chance and Ambiguous Situations

	INTERNALS			EXTERNALS		
	Skill	Chance	Ambiguous	Skill	Chance	Ambiguous
Expectancy	Decrement	No change	Same as skill	No change	Decrement	Same as chance
Reaction Time	Increase	No change	Same as skill	No change	Increase	Same as chance

METHOD

Design

A 3 x 2 x 2 x 2 factorial design was used with the last factor, trials, treated as a repeated measure (Winer, 1962). There were three situations: skill, chance, and ambiguous, with a reward and non-reward condition for each. Each of the above groups was further subdivided into groups on the basis of the I-E dimension, producing a total of 12 groups with 15 Ss per group.

Since there were two dependent variables, reaction time and expectancy, a separate analysis was done on each.

Subjects

One hundred and eighty female subjects (90 internals and 90 externals) from Introductory Psychology classes at Kansas State University participated in the study. They were selected on the basis of their scores on the I-E scale (Rotter, 1966). The I-E scale was scored in the internal direction. The mean score was 15.68 (SD = 3.84) and the median was 16. Ss who scored above the median of 16 were designated as internals and Ss who scored below the median were considered externals.

Procedure

A stratifying procedure was used to assign Ss to the various groups. For example, Ss who had identical scores on the I-E scale were assigned to groups so that each group had an equal number of Ss with identical scores. In this manner, the

Ss were evenly distributed across groups according to their scores on the I-E scale. In order to control for possible experimenter bias, Ss were coded by a research assistant to prevent E from knowing which Ss were externals and which were internals.

The task consisted of predicting supposed children's responses to a children's personality test. The Ss were shown 13 cards; each card served as a trial. Each card contained two geometric figures and S had to state which of the two figures a child would choose as more friendly, aggressive, alert, etc. There was a total of 26 figures and 13 adjectives. Since one reinforcement schedule was used (see Table II), the figures and adjectives were paired in such a way as to make either a correct or incorrect answer plausible for those cards on which the S was to receive a negative reinforcement. At the end of the experiment, the S had the opportunity to ask for explanations of wrong answers. The cards and explanations are shown in Appendix B. The cards were presented in the same sequence to all Ss.

The reward was introduced after the sixth card. The reward consisted of 4 extra experimental points that the Ss could add to their final point total in Introductory Psychology. The S was to receive the reward if her response to either Card 7 or 8 was correct. Previous work by Phares (1965) indicated that this was both a credible and effective reward. As Table II indicates, Trials 7 and 8 were failure trials for all Ss.

Table II

Reinforcement Sequence

Trial	1	2	3	4	5	6	7	8	9	10	11	12	13
Reinforcement	+*	-	-	+	-	+	-	-	+	+	-	+	+

* + refers to success
- refers to failure

Expectancy statements and decision time were the dependent variables. Before S saw each card she was asked to state on an 11 point scale how confident she was that her judgment on the next card would be correct. The points along this scale were defined by E. Decision time was measured with a standard stop watch. Timing began when S was handed the card and ended when she indicated the child's response to the card. Ss were told they would be timed but that there was no time limit. No explanation was given them for the timing.

Instructions

The wording of the instructions attempted to produce either a skill or chance set except in the case of the ambiguous groups where neither skill nor chance instructions were given to Ss. All reward groups received exactly the same instructions when the reward was introduced after the sixth card. The verbatim instructions are presented in Appendix C.

RESULTS

The average correlation between expectancy statements and decision time for Trials 7 and 8 was -.017. Thus, the finding by Rotter and Mulry (1966), Barker (1946), and Lotsof (1956) that decision time was not influenced by expectancy was clearly confirmed.

Expectancy Statements

In order to test the hypotheses concerning introduction of reward, the mean of each S's first six expectancies was used as a correction factor for Trials 7 and 8. The correction procedure consisted of subtracting the mean of each S's first six expectancies from her stated expectancy for Trial 7 and Trial 8. An analysis of variance was computed for the obtained mean difference scores, treating Trials 7 and 8 as repeated measures. The data were corrected for initial mean expectancy in order to reduce any influence that differing initial expectancies might exert on Trials 7 and 8 in which the reward-nonreward condition was introduced. The corrected data are presented in Table III.

The uncorrected data for all trials are presented in Table IV and are graphically summarized in Figure 1 for the skill, chance, and ambiguous situations under the reward and nonreward conditions. The expectancy level indicated for each trial refers to expectancy statements made prior to performance on that trial.

The initial analysis of the corrected data for all three

Table III

Corrected Expectancy Mean Difference Scores
For Reward-(Nonreward) Trials

			Mean of 1-6	Trial 7	Trial 8
Skill	Internal	N=15	4.93	+.07	-.53
		N=15	(5.81)	(+.65)	(-.29)
	External	N=15	5.47	-.20	-.87
		N=15	(5.32)	(-.25)	(-.65)
Chance	Internal	N=15	5.78	-.24	-.78
		N=15	(5.63)	(+.57)	(-.10)
	External	N=15	5.45	+.41	-.39
		N=15	(5.34)	(+.66)	(+.33)
Ambiguous	Internal	N=15	5.98	-.24	-.64
		N=15	(5.47)	(+.40)	(-.14)
	External	N=15	5.23	-.30	-1.10
		N=15	(5.49)	(+.51)	(-.29)

Table IV

Mean Expectancies for Internals and Externals
In Skill, Chance and Ambiguous Situations
Under the Reward-(Nonreward) Conditions

Trials		1	2	3	4	5	6	7	8	9	10	11	12	13
Skill	Internal	4.933	5.866	5.400	4.000	5.000	4.400	5.000	4.400	3.666	4.400	5.000	4.466	5.066
		(5.600)	(6.733)	(6.066)	(5.066)	(5.733)	(5.733)	(6.466)	(5.533)	(4.333)	(5.800)	(6.333)	(5.066)	(6.533)
	External	4.866	6.200	5.866	5.133	5.600	5.133	5.266	4.600	4.200	5.333	5.866	5.066	5.866
		(5.066)	(5.933)	(5.600)	(4.800)	(5.866)	(4.666)	(5.066)	(4.666)	(4.200)	(5.200)	(5.600)	(5.066)	(5.733)
Chance	Internal	5.200	6.533	5.866	5.066	6.000	5.800	5.533	5.000	4.533	5.400	5.533	5.333	5.533
		(5.666)	(6.666)	(5.800)	(4.600)	(6.066)	(5.400)	(6.200)	(5.533)	(4.400)	(5.266)	(6.333)	(5.666)	(6.333)
	External	5.066	6.466	5.400	4.866	5.800	5.133	5.866	5.066	5.066	5.533	5.933	5.200	6.133
		(4.533)	(6.400)	(5.600)	(4.733)	(5.800)	(5.000)	(6.000)	(5.666)	(4.800)	(6.000)	(6.066)	(5.200)	(6.200)
Ambiguous	Internal	6.066	6.733	6.000	5.266	6.266	5.466	5.733	5.333	5.122	5.800	6.066	5.933	6.466
		(4.933)	(6.266)	(5.533)	(5.000)	(5.533)	(5.533)	(5.866)	(5.333)	(5.000)	5.200)	(5.666)	(5.333)	(5.933)
	External	4.533	6.266	5.466	4.466	5.733	4.933	4.933	4.122	3.466	4.400	5.200	4.666	5.866
		(5.066)	(6.333)	(5.466)	(5.066)	(5.933)	(5.133)	(6.000)	(5.200)	(4.600)	(5.333)	(6.066)	(5.266)	(5.933)

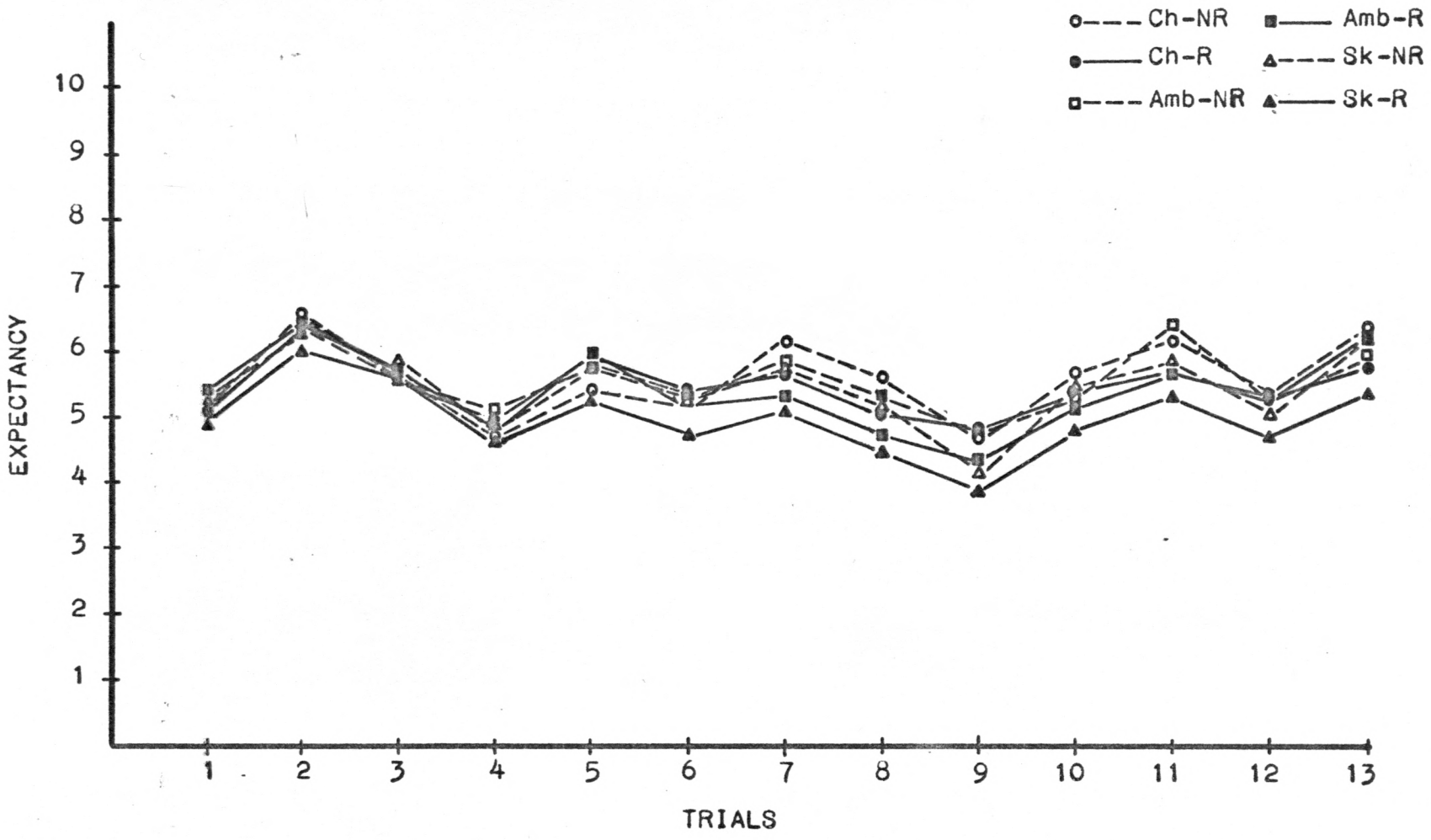


Fig. 1. Expectancy changes for skill, chance, and ambiguous groups under conditions of reward and nonreward.

situations under all conditions indicated that neither the situational factor (skill, chance, or ambiguous) nor the internal-external factor showed significant effects (see Summary Table I). However, both Trials (F = 80.55; df = 1/168; $p < .001$) and the reward-nonreward condition (F = 13.191; df = 1/168; $p < .001$) yielded highly significant effects. For all three situations, expectancies were lower for the reward than the nonreward groups. If the reward conditions had not been significant, it would not have been possible to test the predictions concerning expectancy changes following the introduction of a reward.

Hypothesis I. Hypothesis I stated that there would be an interaction between the skill-chance dichotomy and the reward-nonreward condition. This hypothesis was based on the premise that introduction of reward following a success experience should result in a decrement in expectancy for the skill situation and no change in expectancy for the chance situation relative to the nonreward controls. In order to test this hypothesis, an analysis of variance was computed, using the corrected expectancy statements for only the skill-chance situational dichotomy. This procedure was equivalent to making orthogonal comparisons between the skill and chance situations, ignoring for the moment the ambiguous situation. The results of the analysis are presented in Summary Table II. Although Trials (F = 49.531; df = 1/112; $p < .001$) and the reward conditions (F = 6.956; df = 1/112; $p < .01$) again showed highly significant effects, neither the skill-chance main effect nor the interaction between the skill-

Summary Table I

Analysis of Variance of Corrected Expectancies
Under the Reward Conditions

SV	DF	SS	MS	F
Between SS	179.	35595.300		
A	2.	711.500	355.750	1.940
B	1.	2418.000	2418.000	13.191**
C	1.	46.400	46.400	.253
AB	2.	322.100	161.050	.878
AC	2.	1094.200	547.100	2.984
BC	1.	28.100	28.100	.153
ABC	2.	181.700	90.850	.495
SS/GPS	168.	30793.300	183.293	
Within SS	180.	11150.200		
T	1.	3518.100	3518.100	80.553**
AT	2.	8.500	4.250	.097
BT	1.	1.600	1.600	.036
CT	1.	.600	.600	.013
ABT	2.	22.800	11.400	.261
ACT	2.	130.700	65.350	1.496
BCT	1.	105.900	105.900	2.424
ABCT	2.	24.800	12.400	.283
TXSS/GPS	168.	7337.200	43.673	
Total	359.	46745.500		

** $p < .001$

For all tables:

A = situation
B = reward-nonreward
C = I - E
T = trials

Summary Table II

Expectancy Changes for Trials 7 and 8
for the Skill and Chance Situations

SV	DF	SS	MS	T
Between SS	119.	21302.000		
A	1.	619.400	619.400	3.824*
B	1.	1126.600	1126.600	6.956**
C	1.	7.300	7.300	.045
AB	1.	192.200	192.200	1.186
AC	1.	1070.400	1070.400	6.609**
BC	1.	145.500	145.500	.898
ABC	1.	2.200	2.200	.013
SS/GPS	112.	18138.400	161.950	
Within SS	120.	7754.500		
T	1.	2315.000	2315.000	49.531***
AT	1.	8.300	8.300	.177
BT	1.	8.100	8.100	.173
CT	1.	30.600	30.600	.654
ABT	1.	12.800	12.800	.273
ACT	1.	17.200	17.200	.368
BCT	1.	128.300	128.300	2.745
ABCT	1.	-.500[1]	-.500	-.010
TXSS/GPS	112.	5234.700	46.738	
Total	239.	29056.500		

* $p < .10$
** $p < .05$
*** $p < .01$

1. The negative sum of squares for the ABCT interaction is the result of machine rounding error.

chance dichotomy and reward-nonreward was confirmed. It is clear from Figure 1 that in both the skill and chance reward groups there was an initial increase in expectancy for success for Trial 7 and a subsequent decrease in expectancy for success on Trial 8.

Although the expected interaction did not occur, there was a difference of borderline significance ($F = 3.824$; $df = 1/112$; $p < .10$) between the skill and chance situations. Apparently the use of instructional set to produce either a skill or chance orientation was only partially successful. Since no instructional set was used for the ambiguous situation, this situation could be used to determine how the task was perceived independently of instructional manipulation. The comparison between the corrected mean expectancy changes for the skill, ambiguous, and chance situations showed mean changes of -.26, -.25, and -.06 respectively. It appears as if the task was perceived as involving skill factors.

Hypothesis IV. Hypothesis IV stated that following the introduction of reward there would be a second order interaction between the situation, reward-nonreward, and internal-external control. Specifically, internals in the skill and ambiguous situations and externals in the chance and ambiguous situations were expected to show a decrement in expectancies following the introduction of reward. However, internals in the chance situation and externals in the skill situation were expected to show no change relative to the non-reward controls (see Table I). This interaction between the situations, the I-E dimension, and reward-

nonreward also failed to be confirmed (see Summary Table II). The pooled mean expectancy changes for the reward and nonreward trials are presented in Table V. Clearly, the data are in the predicted direction except for (a) the internals in the chance-reward situation who show a mean decrease in expectancy of -.51 whereas the nonreward controls show a mean increase of +.25, and (b) the externals in the skill nonreward condition who show a mean decrease of -.45 whereas all other nonreward groups show mean increases in expectancy ranging from +.11 to +.51. A comparison of the reward groups yields the rather interesting finding that externals in the chance-reward group showed a corrected mean increase in expectancy of +.01 while all the other reward groups, including the external-ambiguous-reward group, showed mean decreases ranging from -.23 to -.70. Also, contrasting the mean decreases in expectancy by externals in the skill and ambiguous reward groups with the mean increase in expectancy by externals in the chance-reward group, one obtains further evidence that the task was perceived as involving essentially skill factors when no attempt at instructional set was made by E.

Hypothesis III. Hypothesis III stated that prior to the introduction of reward, there would be an interaction between the skill-chance dichotomy and internal-external control. This hypothesis was based on the premise that internals would have higher expectancies in the skill than in the chance situation while externals would have higher expectancies in the chance than skill situation. Although the analysis of the corrected mean ex-

pectancy change for the skill and chance situations over Trials 7 & 8 (see Summary Table II) showed a significant interaction between the situational dichotomy and the I-E dimension (F = 6.609; df = 1/112; $p < .025$), this was not a direct test of the hypothesis since (a) the data represent expectancy change rather than absolute expectancy, and (b) the interaction represents effects which are pooled across the highly significant reward-nonreward conditions.

Table V

Corrected Mean Expectancy Change in Skill, Chance, and Ambiguous Situations for Internal and External Subjects Under the Reward and (Nonreward) Conditions

SKILL		CHANCE		AMBIGUOUS	
I	E	I	E	I	E
-.23	-.54	-.51	+.01	-.44	-.70
(+.18)	(-.45)	(+.25)	(+.50)	(+.26)	(+.11)

A direct test of Hypothesis II was made by analyzing Ss' expectancy statements prior to the introduction of reward. The results of the analysis are shown in Summary Table III. There is no indication of a significant interaction between the situational dichotomy and the I-E dimension. The analysis also shows that there was no difference of any significance between either the skill, ambiguous, and chance situations, or the

Summary Table III

Analysis of Variance of Expectancy Data
Prior to Introduction of Reward

SV	DF	SS	MS	F
Between SS	179.	1506.596		
A	2.	6.624	3.312	.389
B	1.	.948	.948	.111
C	1.	12.892	12.892	1.516
AB	2.	13.291	6.645	.781
AC	2.	7.503	3.751	.441
BC	1.	.834	.834	.098
ABC	2.	36.516	18.258	2.148
SS/GPS	168.	1427.988	8.499	
Within SS	900.	1025.390		
T	5.	274.830	54.966	65.308**
AT	10.	7.398	.739	.879
BT	5.	.274	.054	.065
CT	5.	11.086	2.217	2.634*
ABT	10.	5.887	.588	.699
ACT	10.	3.786	.378	.449
BCT	5.	2.766	.553	.657
ABCT	10.	12.391	1.239	1.472
TXSS/GPS	840.	706.972	.841	
Total	1079.	2531.986		

* $p < .025$
** $p < .01$

reward and nonreward groups. Since there were no differences between the reward and nonreward groups prior to the introduction of reward, the highly significant effect resulting from the introduction of reward on Trials 7 & 8 was not confounded by any differences between the groups prior to the introduction of reward.

The analysis did, however, indicate a significant Trials effect (F = 65.308; df = 5/840; $p < .001$) and a significant interaction between Trials and internal-external control (F = 2.634; df = 5/840; $p < .025$). The interaction is graphically summarized in Figure 2, and an LSD test of significant differences indicated that internals and externals had significantly different expectancies (p .05) for only Trials 1 & 6. A closer look at the data also indicated that this interaction was due to the higher expectancies of internals as compared with the lower expectancies of externals in the ambiguous situation. Also, an analysis of the first six expectancy statements for Ss in only the skill and chance situations yielded no significant interaction between internal-external control and Trials.

Other results. In order to determine whether the introduction of reward had any effect on subsequent trials, an analysis of variance was computed for all the trials following the last reward trial, i.e. Trials 9-13. The analysis, which is shown in Summary Table IV, indicated (a) a significant interaction between the situations, the I-E dimension, and the reward-nonreward conditions (F = 3.153; df = 2/168; $p < .05$), and (b) an interaction

Summary Table IV

Analysis of Expectancy Data
for Trials 9-13

SV	DF	SS	MS	F
Between SS	179.	1553.710		
A	2.	22.286	11.143	1.312
B	1.	17.361	17.361	2.045
C	1.	1.520	1.520	.179
AB	2.	5.429	2.714	.319
AC	2.	27.177	13.588	1.600
BC	1.	.491	.491	.057
ABC	2.	53.526	26.763	3.153**
SS/GPS	168.	1425.920	8.487	
Within	720.	837.200		
T	4.	256.593	64.148	79.735***
AT	8.	6.447	.805	1.001
BT	4.	1.767	.441	.549
CT	4.	1.452	.363	.451
ABT	8.	8.727	1.090	1.355
ACT	8.	11.468	1.433	1.781*
BCT	4.	5.326	1.331	1.655
ABCT	8.	4.790	.598	.744
TXSS/GPS	672.	540.630	.804	
Total	899.	2390.910		

* $p < .10$
** $p < .05$
*** $p < .001$

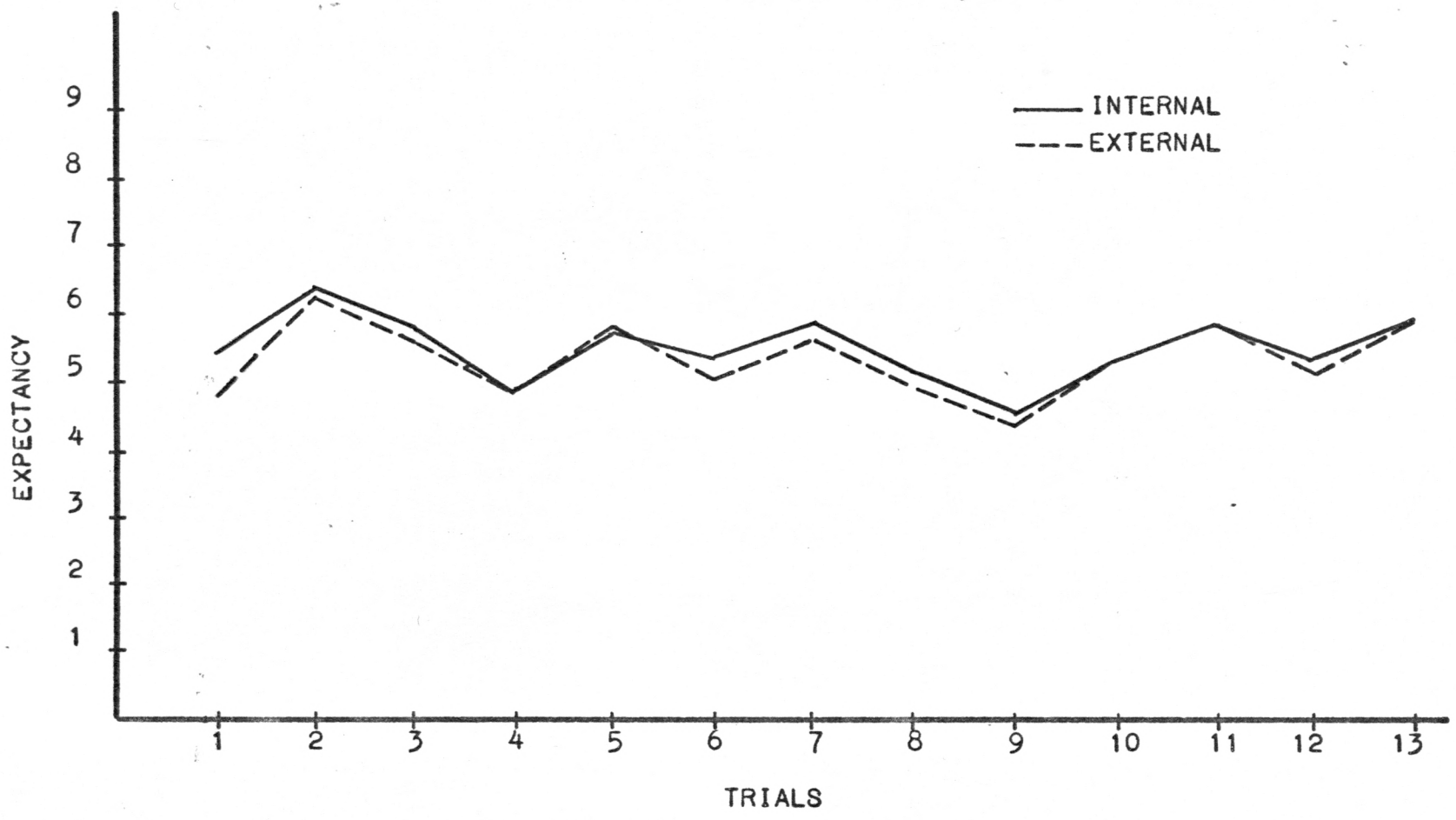


Fig. 2. Mean expectancies of internal and external subjects.

of borderline significance between the situation, internal-external control, and Trials (F = 1.781; df = 8/672; $p < .10$).

The means relative to the first interaction are presented in Table VI. An LSD test of significant differences showed both the internal-skill-reward and external-ambiguous-reward groups to have significantly (p .05) lower mean expectancies than (a) the internal-skill-nonreward group, (b) internals and externals in the chance nonreward groups, and (c) the internal-ambiguous-reward group. The data for the reward groups is graphically presented in Figure 3. The internal-skill-reward group had lower expectancies than the external-skill-reward group on the two trials immediately before the introduction of reward and for all trials following the introduction of reward. The external-chance-reward group, however, increased its expectancies following the introduction of reward to the point where the externals in this group had higher expectancies for success than any other skill or chance-reward group.

The interaction between the situations, I-E, and Trials is graphically summarized in Figure 4. The figure shows that for the skill situation the results are in complete opposition to the presumption that internals might have higher expectancies than externals in the skill situation (see Hypothesis IV). In short, for Trials 9-13, externals have higher expectancies than internals for success in the skill situation. The data for the chance situation are in the expected direction since it could be presumed that externals would show a higher expectancy for

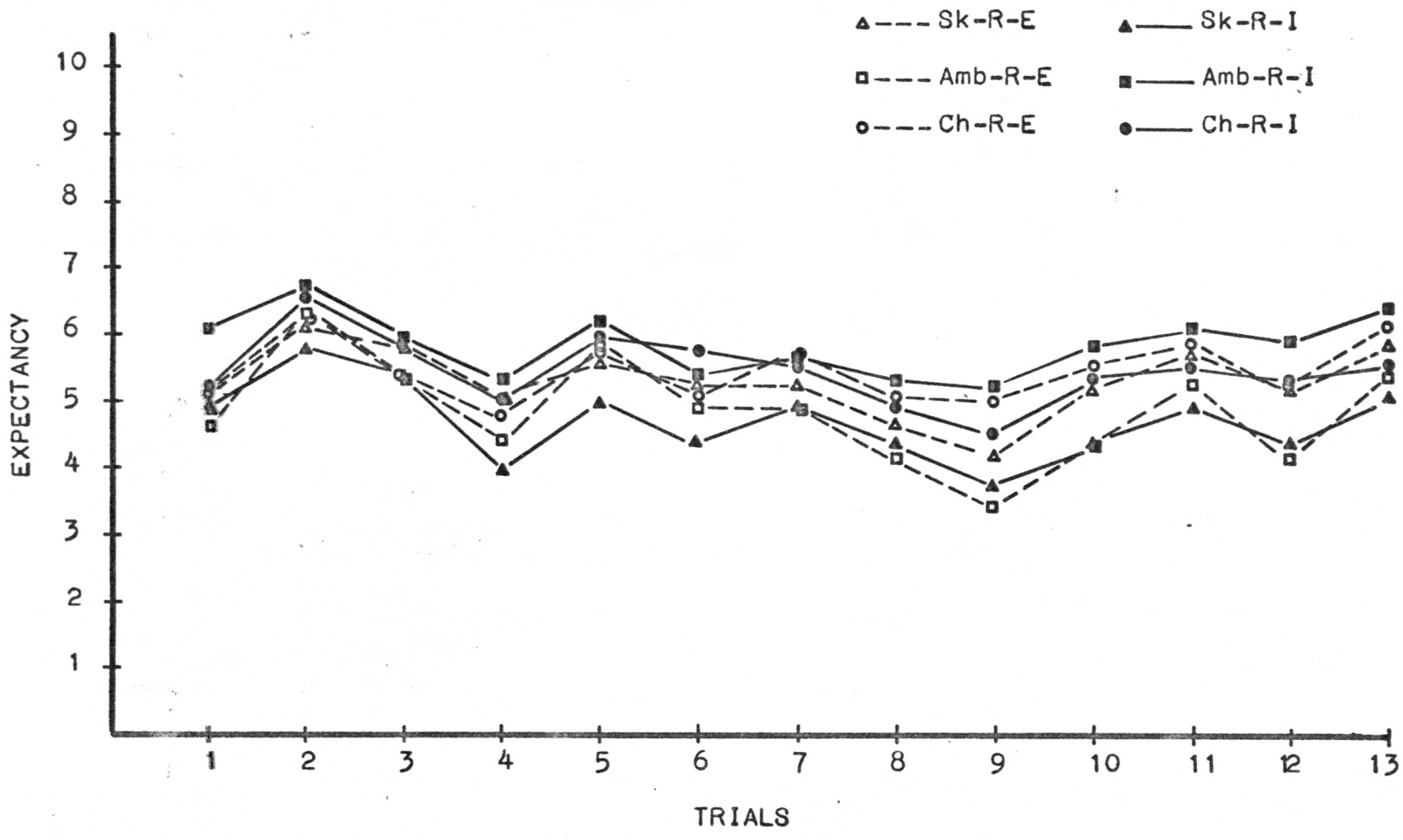


Fig. 3. Mean expectancies for internal and external subjects in the skill, chance, and ambiguous situations under the reward condition.

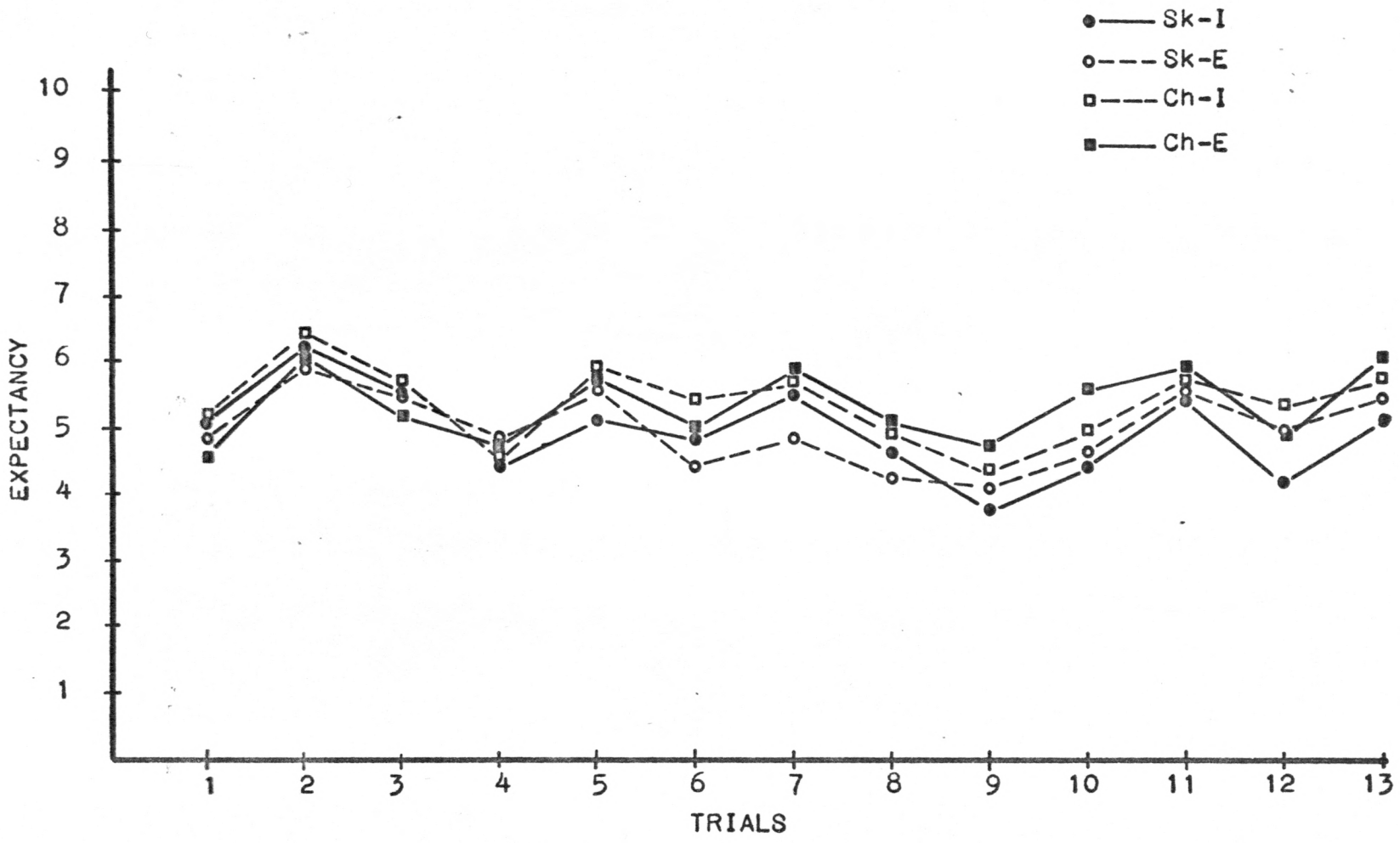


Fig. 4. Expectancy statements for internal and external subjects in skill and chance situations.

success in the chance situation than internals in the same situation.

Table VI

Mean Expectancy in Skill, Chance, and Ambiguous Situations for Internal and External Subjects in the Reward and (Nonreward) Conditions for Trials 9-13

SKILL		AMBIGUOUS		CHANCE	
I	E	I	E	I	E
4.42	5.26	5.88	4.72	5.26	5.57
(5.61)	(5.16)	(5.43)	(5.43)	(5.59)	(5.65)

LSD = .79

Decision Time

As in the case of the expectancy data, mean difference scores were used for the analysis of Trials 7 & 8 in order to test the hypothesis concerning decision time and the introduction of reward. The corrected data are presented in Table VII. The uncorrected data are shown in Table VIII and are graphically summarized for all three situations under the reward-nonreward conditions in Figure 5.

The initial analysis of the corrected data for all three situations under all conditions shows neither a significant situational nor internal-external control effect. However, the reward factor ($F = 18.265$; $df = 1/168$; $p < .001$) and Trials

Table VII

Corrected Decision Time (in seconds) Mean Difference Scores for Reward-(Nonreward) Trials

			Mean of 1-6	Trial 7	Trial 8
Skill	Internal	N=15	5.17	+2.74	5.85
		N=15	(5.27)	(- .11)	(1.22)
	External	N=15	5.49	+ .55	4.05
		N=15	(5.44)	(+1.02)	(2.01)
Chance	Internal	N=15	4.59	+1.86	1.91
		N=15	(5.37)	(- .07)	(.85)
	External	N=15	6.16	+ .83	4.12
		N=15	(5.21)	(- .06)	(1.82)
Ambiguous	Internal	N=15	5.38	+1.98	2.65
		N=15	(5.58)	(- .81)	(1.12)
	External	N=15	4.17	+ .80	2.27
		N=15	4.85	(- .03)	(1.67)

Table VIII

Mean Decision Times for Internals and Externals
In Skill, Chance and Ambiguous Situations
Under the Reward-(Nonreward) Conditions

Trial		1	2	3	4	5	6	7	8	9	10	11	12	13
Skill	Internal	5.600	5.026	4.053	4.033	5.713	6.613	7.013	11.020	6.353	6.706	7.320	6.326	4.300
		(6.280)	(4.720)	(4.133)	(4.846)	(4.973)	(6.666)	(5.160)	(6.493)	(5.740)	(5.000)	(5.880)	(5.366)	(4.200)
	External	5.073	5.100	4.140	5.046	5.993	7.660	6.033	9.533	6.453	6.433	5.800	6.593	3.833
		(4.433)	(5.820)	(4.200)	(5.386)	(5.400)	(7.373)	(6.460)	(7.446)	(8.546)	(6.953)	(7.833)	(6.333)	(4.326)
Chance	Internal	4.693	4.808	4.160	3.980	5.186	5.426	6.446	6.493	5.140	6.000	5.526	4.406	3.066
		(5.780)	(5.686)	(4.360)	(4.193)	(4.833)	(7.373)	(5.306)	(6.213)	(6.433)	(5.986)	(4.800)	(4.700)	(3.126)
	External	6.326	6.133	4.326	6.080	6.900	7.206	6.993	10.293	5.840	6.133	6.880	4.906	3.566
		(4.786)	(4.413)	(4.086)	(4.446)	(6.553)	(6.986)	(5.153)	(7.026)	(4.693)	(5.440)	(5.413)	(5.606)	(3.393)
Ambiguous	Internal	5.893	4.940	5.026	4.786	4.633	7.013	7.366	8.026	5.160	5.460	4.853	5.073	3.740
		(4.706)	(5.700)	(3.986)	(5.006)	(6.046)	(8.040)	(4.773)	(6.706)	(6.653)	(5.253)	(5.606)	(6.733)	(3.346)
	External	4.653	4.053	3.206	3.560	4.040	4.813	4.973	6.446	4.700	4.753	4.566	4.326	3.333
		(4.440)	(5.233)	(3.146)	(4.066)	(6.440)	(5.126)	(4.833)	(6.526)	(5.433)	(3.606)	(4.946)	(5.200)	(2.726)

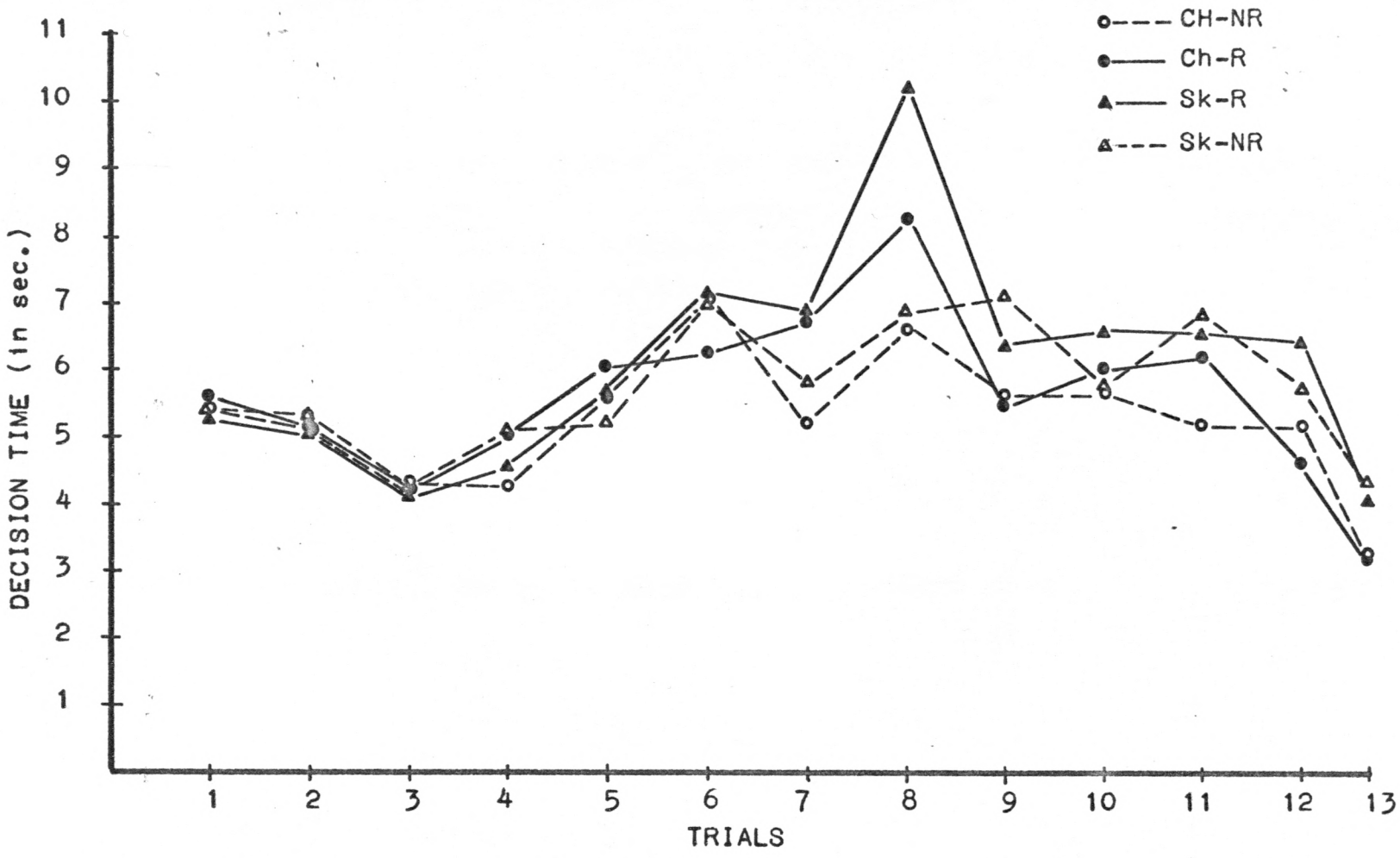


Fig. 5. Mean decision time for the skill and chance situations under the reward and nonreward conditions.

(F = 28.481; df = 1/168; $p < .001$), as with the expectancy data, show highly significant effects (see Summary Table VI). In all three situations, decision time was longer for the reward than the nonreward groups.

Hypothesis II. Hypothesis II stated that following the introduction of reward there would be an interaction between the skill-chance dichotomy and reward-nonreward. This hypothesis was based on the premise that following the introduction of reward, decision time would increase more in the skill than in the chance situation relative to the non-reward controls. In order to test this hypothesis, an analysis of the corrected decision time data for only the skill and chance situations was computed. The results are presented in Summary Table VI. Although the reward factor (F = 13.715; df = 1/112; $p < .001$) and Trials (F = 20.042; df = 1/112; $p < .001$) were highly significant, the predicted interaction between the skill-chance dichotomy and reward-nonreward was not confirmed. However, Figure 5 suggests that the changes were, at least, in the predicted direction.

Hypothesis IV. Hypothesis IV stated that following the introduction of reward there would be a second order interaction between the situations, reward-nonreward, and internal-external control. This was based on the premise that internals would increase their decision time following the introduction of reward in a skill situation and show no change in the chance situation. Externals, on the other hand, should show an increase in decision time following the introduction of reward in

Summary Table V

Analysis of Variance of Corrected Decision Times
Under the Reward Conditions

SV	DF	SS	MS	F
Between SS	179.	301147.000		
A	2.	6218.800	3109.400	2.038
B	1.	27857.300	27857.300	18.265***
C	1.	3.200	3.200	.002
AB	2.	1134.900	567.450	.372
AC	2.	1645.600	822.800	.539
BC	1.	4646.800	4646.800	3.046
ABC	2.	3414.500	1707.250	1.119
SS/GPS	168.	256225.900	1525.154	
Within SS	180.	198854.200		
T	1.	27443.600	27443.600	28.481***
AT	2.	1058.900	529.450	.549
BT	1.	698.800	698.800	.725
CT	1.	1448.800	1448.800	1.503
ABT	2.	3283.500	1641.750	1.703
ACT	2.	1832.200	916.100	.950
BCT	1.	968.600	968.600	1.005
ABCT	2.	240.300	120.150	.124
TXSS/GPS	168.	161879.500	963.568	
Total	359.	500001.200		

*** $p < .001$

Summary Table VI

Reaction Time Anges for Trials 7 and 8
for the Skill and Chance Situations

SV	DF	SS	MS	F
Between SS	119.	214128.900		
A	1.	3409.500	3409.500	2.134
B	1.	21907.700	21907.700	13.715***
C	1.	.200	.200	0.000
AB	1.	721.800	721.800	.451
AC	1.	1632.800	1632.800	1.022
BC	1.	3142.100	3142.100	1.967
ABC	1.	3414.100	3414.100	2.137
SS/GPS	112.	178900.700	1597.327	
Within SS	120.	149501.200		
T	1.	21409.800	21409.800	20.042***
AT	1.	692.400	692.400	.648
BT	1.	2257.000	2257.000	2.112
CT	1.	1631.800	1631.800	1.527
ABT	1.	1267.600	1267.600	1.186
ACT	1.	1571.700	1571.700	1.471
BCT	1.	825.200	825.200	.772
ABCT	1.	206.600	206.600	.193
TXSS/GPS	112.	119639.100	1068.206	
Total	239.	362630.100		

*** $p < .001$

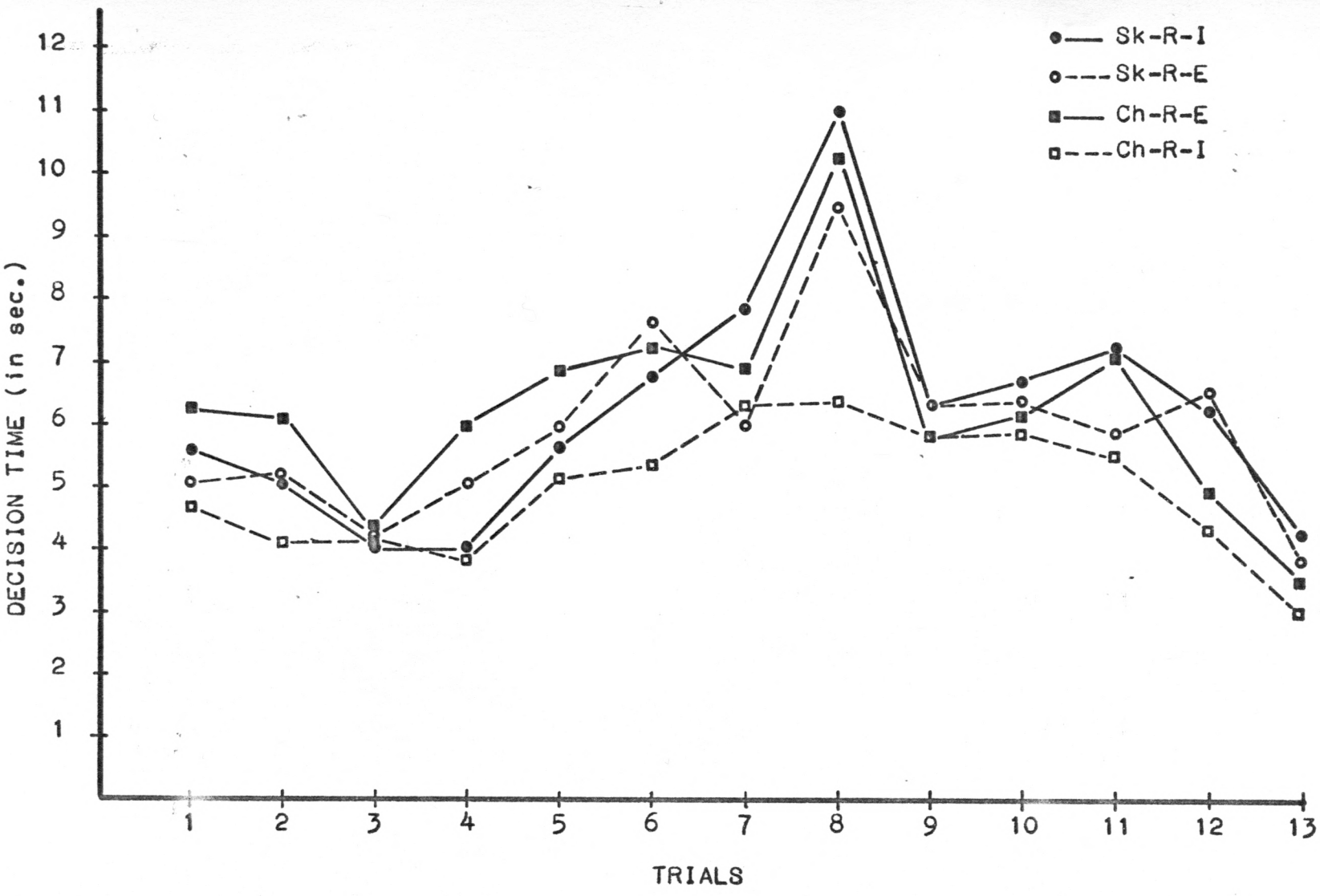


Fig. 6. Mean decision time of internal and external subjects in skill and chance situations under the reward conditions.

the chance situation and show no change in the skill situation. Since the analysis of the corrected data did not indicate a significant interaction between the situation, internal-external control, and reward-nonreward, neither of these predictions was confirmed. Again, however, the data which are graphically summarized in Figure 6 were in the predicted direction. In the skill situation, internals showed a steady increase in decision time over the two reward trials; the externals, however, showed an initial decrease in decision time for the first reward trial and then a large increase for the last reward trial. In the chance situation, the internals showed an increase in decision time for the first reward trial and no change for the last reward trial; the externals, however, showed a small decrease followed by a large increase for the two respective reward trials.

Hypothesis III. Hypothesis III stated that there would be an interaction between the situations and internal-external control. This was based on the premise that internals would have longer decision times in skill situations as opposed to chance situations, while, conversely, externals would have longer decision times in chance situations as opposed to skill situations. The analysis, which is presented in Summary Table VII, shows a significant interaction between the situation and the I-E dimension ($F = 3.298$; $df = 2/168$; $p < .05$) as well as a significant Trials effect ($F = 23.391$; $df = 5/840$; $p < .001$). The mean decision times for the first six trials for internals and

Summary Table VII

Analysis of Variance for Decision Time
Prior to Introduction of Reward

SV	DF	SS	MS	F
Between SS	179.	4252.341		
A	2.	38.290	19.145	.810
B	1.	4.217	4.217	.178
C	1.	.494	.494	.020
AB	2.	14.119	7.059	.299
AC	2.	155.718	77.859	3.298**
BC	1.	14.865	14.865	.629
ABC	2.	58.709	29.354	1.243
SS/GPS	168.	3965.929	23.606	
Within SS	900.	6166.808		
T	5.	717.564	143.512	23.391***
AT	10.	13.933	1.393	.227
BT	5.	21.672	4.334	.706
CT	5.	49.636	9.927	1.618
ABT	10.	83.228	8.322	1.356
ACT	10.	76.811	7.681	1.251
BCT	5.	20.697	4.139	.674
ABCT	10.	29.716	2.971	.484
TXSS/GPS	840.	5153.551	6.135	
Total	1079.	10419.149		

** $p < .05$
*** $p < .001$

externals in all three situations are shown in Table IX. An LSD test of significant differences indicated that the interaction was due to the low mean decision time of the externals in the ambiguous situation which is significantly lower ($p < .05$) than all other groups except the internal skill and chance groups. No other means were significantly different from each other. Since the analysis also shows no situational, internal-external control, nor reward-nonreward effects prior to the introduction of reward, there is no firm evidence that the interaction between the situation and the I-E dimension negated the predictions concerning the reward trials. It should be noted, however, that although the differences were not significant, the internals had a lower mean decision time than externals in the skill situation. This is in the opposite direction from the prediction that internals would have longer decision times than externals in the skill situation. The mean decision times for internals and externals in the chance situation are in the predicted direction since Hypothesis III stated that externals should have longer decision times than internals in the chance situation.

Other results. As with the expectancy data, a final analysis was made on Trials 9-13 to determine whether or not the introduction of reward had any effect on subsequent trials for which no reward was possible. The analysis, presented in Summary Table VIII, indicated a significant Trials effect ($F = 34.386$; $df = 4/672$; $p < .001$) and a highly significant situational effect

Summary Table VIII

Analysis of Variance for Trials 9-13
of the Decision Time Data

SV	DF	SS	MS	F
Between SS	179.	4166.506		
A	2.	254.438	127.219	5.731*
B	1.	.744	.744	.033
C	1.	.023	.023	.001
AB	2.	11.288	5.644	.254
AC	2.	83.117	41.558	1.872
BC	1.	2.163	2.163	.097
ABC	2.	85.680	42.840	1.930
SS/GPS	168.	3729.053	22.196	
Within SS	720.	4192.804		
T	4.	671.952	167.988	34.386**
AT	8.	52.181	6.522	1.335
BT	4.	38.561	9.640	1.973
CT	4.	4.747	1.186	.242
ABT	8.	52.223	6.527	1.336
ACT	8.	48.210	6.026	1.233
BCT	4.	5.721	1.430	.292
ABCT	8.	36.306	4.538	.928
TXSS/GPS	672.	3282.903	4.885	
Total	899.	8359.310		

* $p < .01$
** $p < .001$

(F = 5.731; df = 2/168; $p < .01$). Although the situation had not been an effective variable prior to the introduction of reward nor for the two reward trials, it was an effective variable for all trials after the last reward trial. The mean decision times for the skill, chance, and ambiguous situations were 6.10, 4.55, and 4.75 respectively. An LSD test (LSD = .559) indicated that, while not significantly different from each other, both the chance and ambiguous situations led to significantly ($p < .01$) lower mean decision times than the skill situation for the last 5 trials.

Table IX

Mean Decision Time of Internal and External Subjects in the Skill, Chance, and Ambiguous Situations over Trials 1-6

	SKILL	AMBIGUOUS	CHANCE
I	5.22	5.49	5.04
E	5.47	4.39	5.68

LSD = 1.01

DISCUSSION

Of immediate concern to Rotter's social learning theory is the finding that in this experimental situation there was no correlation between expectancy and reinforcement value over the two reward trials. This finding offers further evidence in support of Rotter's assumption that expectancy and reinforcement value are independent. However, the current study, in confirming an assumption of Rotter's theory and then failing to confirm hypotheses presumably derived from this theory, necessitates a cautious interpretation of the finding that expectancy and reinforcement value were independent in this study. Perhaps the current experimental design was an inadequate test of the hypotheses. However, further research is necessary to investigate the relationship between this assumption of Rotter's and the hypotheses which can be derived from his theory. In short, there is no guarantee that expectancy and reinforcement value would remain independent if the other predictions derived from Rotter's theory had been confirmed.

Expectancy

The finding that introduction of reward in either skill, chance, or ambiguous situations results in a decrement in expectancies for all three situations was in agreement with the earlier results obtained by Phares (1965). There are at least two explanations for the present results. The first is simply that the use of instructional set was not successful as regards the chance groups. Since the task involved the prediction of a

child's responses, there may have been a certain amount of reluctance on the part of female Ss, who are expected on a cultural basis to be knowledgable about children, to perceive the situation as one entirely consisting of chance or luck factors. Since the data show no difference between the decision times or expectancies in the skill, chance, or ambiguous situations prior to the introduction of reward, there is some evidence that S's in the chance situation may have failed to assume a chance set. Phares' findings (1957, 1965) that there were clear differences between expectancy statements in skill and chance situations adds support to this conclusion. The similarity of the means for the ambiguous and skill situations also suggests that, despite its novelty, the task was perceived as primarily controlled by skill factors. However, the difference between the expectancy changes for the skill and chance situations for the two reward trials indicates that, at least for the reward trials, the skill and chance sets may have been operative. Thus, although the situational dichotomy was perhaps not effectively created for the trials prior to the introduction of reward, the introduction of reward apparently increased the importance of the situation to the point where a skill-chance distinction was at least partially effective.

The second possible explanation of the decrement in expectancies for the reward trials involves the cultural significance of reward. Since the attainment of reward is highly regarded in our culture, it may be that the opportunity for re-

ward over-rides the skill-chance dichotomy and results in a decrement in expectancy no matter how the situation is structured. Although the expectancy changes for the skill situation were lower than those of the chance situation for Trials 7 and 8, the fact that both situations showed decrements lends support to the notion that a reward may have the ability to over-ride either a skill or chance set and to produce defensive reactions in both situations.

Although no predictions were made concerning expectancy statements following the last reward trial, the highly significant interaction of the situational set with the I-E personality dimension and reward-nonreward makes a certain amount of sense. Since internals perceive reinforcement as contingent upon their own behavior, and are therefore skill oriented, they might (and do in the present experimental situation) have lower expectancies for the trials following failure to obtain a reward than externals who perceive reinforcement as contingent upon others or luck factors. In short, because of their skill orientation, internals in a skill situation may perceive failure as a personal failure reflecting a lack of competence and thus react more defensively by lowering their expectancies on subsequent trials. The chance oriented externals, however, may have simply perceived failure as meaning that they were not lucky on that trial.

Applying the same reasoning to the chance situation after failure to obtain a reward, one would expect the externals to have lower expectancies due to defensive reactions since they are

concerned with whether or not they are lucky. Internals, on the other hand, would not be expected to be defensive since they are in a chance situation and are thus relieved of the responsibility to be skillful. However, the opposite occurred as internals had lower expectancies than externals. This may indicate that failure to obtain a reward in any situation is taken as a personal failure by an internal since he views reinforcement as contingent upon his own behavior. However, externals do not have to feel defensive, or react as if they had failed, since they themselves are not personally responsible for the failure; i.e. failure was simply a matter of chance and their actions made little or no difference. Such an interpretation leads to the hypothesis that the generalized expectancy toward chance events that is assumed by an external is a defensive orientation since it frees the individual from assuming responsibility for his failures no matter how the situation is structured. An external orientation may also permit "wishful thinking" such as that exhibited by the externals in the chance-reward group when they showed a mean increase over the reward trials whereas the other reward groups showed mean decreases in expectancy. If this general interpretation is correct, it would explain why the interaction between the situation, internal-external control, and Trials 9-13 (the trials following the last reward trial) indicated that externals had higher expectancies in both the skill and chance situations.

Reinforcement value

Neither of the major predictions concerning reinforcement

value or decision time were confirmed. Reinforcement value did not increase significantly more in the skill than in the chance situation following the introduction of reward. The reinforcement value of a reward in a skill situation was not significantly greater than the reinforcement value of a reward in a chance situation for internally oriented Ss. And the reinforcement value of a reward in a chance situation was not greater than the reinforcement value of a reward in a skill situation for externally oriented Ss. The data were, however, in the predicted direction.

Again the major finding of interest concerned Trials 9-13, or the trials after the failure to obtain a reward. Specifically, the opportunity for reward and the failure to obtain that reward resulted in a significantly longer decision time in the skill situation as opposed to the chance situation. Apparently failure to obtain a reward increased Ss' reliance on the instructional set toward either skill or chance to the extent that success in a skill situation, which directly challenged S's competency, had greater reinforcement value than success in a chance situation, which did not challenge Ss' competency.

CONCLUSIONS

Although the data indicated no relationship between expectancy and reinforcement value, no firm theoretical conclusions can be drawn about the independence of expectancy and reinforcement value since the other predictions, which were also derived from Rotter's social learning theory, were not confirmed.

The major significance of this study lies in the findings that following a failure to obtain a reward (a) internals react defensively by lowering their expectancies for success in both skill and chance situations whereas externals appear to be free of responsibility for failure in both situations; and (b) the reinforcement value of a skill situation is significantly greater than the reinforcement value of a chance situation. In light of these findings it would be advisable for future investigators to study the effects of failure more carefully. Such studies would help to clarify the post hoc hypothesis offered by this study that an external orientation, which views reinforcement as contingent upon others or luck factors rather than one's own actions, is a defensive orientation which frees the Ss from responsibility for failure.

Also, in the attempt to clarify the reinforcing value of skill or chance situations to internal and external Ss, it might be advisable for future investigators to use a more representative approach. In other words, rather than try to create either a skill or chance orientation for the same task, they might give the Ss their choice of a variety of tasks ranging from those involving a

high degree of skill to those which are pure chance. Studying the effect of introduction of reward in such a representative design might prove more fruitful than the approach used in the present study.

REFERENCES

Atkinson, J. W. Motivational determinants of risk-taking behavior. Psychol. Rev., 1957, 64, 359-372.

Barker, R. An experimental study of relationship between certainty of choice and the relative valence of the alternative. J. Pers., 1946, 15, 41-52.

Edwards, W. The prediction of decisions among bets. J. exp. Psychol., 1955, 50, 201-214.

Efran, J. S. Some personality determinants of memory for success and failure. (Doctoral dissertation, Ohio State University) Ann Arbor, Mich.: University Microfilms, 1964, No. 64-4793-4794.

Feather, N.T. Subjective probability and decision under uncertainty. Psychol. Rev., 1959, 66, 150-164.

Gore, Pearl M., and Rotter, J. B. A personality correlate of social action. J. Pers., 1963, 31, 58-64.

Lewin, K., Dembo, Tamara, Festinger, L., and Sears, Pauline S. Level of aspiration. In J. McV. Hunt, (Ed.), Personality and the behavior disorders. New York: Ronald, 1944.

Lotsof, E. J. Reinforcement-value and decision-time. J. Psychol., 1956, 41, 427-435.

Phares, E. J. Expectancy changes in skill and chance situations. J. abnorm. soc. Psychol., 1957, 54, 339-342.

Phares, E. J. Effects of reinforcement value on expectancy statements in skill and chance situations. Percept. mot. Skills, 1965, 20, 845-852.

Rotter, J. B. Social learning and clinical psychology. Englewood Cliffs: Prentice-Hall, 1954.

Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 80, No. I., Whole No. 609.

Rotter, J. B., and Mulry, R. C. Internal versus external control of reinforcement and decision time. J. pers. soc. Psych., 1965, 2, 598-604.

Seeman, M. An experimental study of alienation and social learning. American Journal of Sociology, 1963,49, 270-284.

Seeman, M., and Evans, J.W. Alienation and learning in a hospital setting. American Sociological Review, 1962, 27, 772-778.

Stromber, E. L. Stromberg Dexterity Test New York: Psychological Corp., 1947-1951.

Tolman, E. C. The determiners of behavior at a choice point. Psychological Review, 1938, 45, 1-41.

Winer, B. Statistical principles in experimental design. New York: McGraw-Hill, 1962.

Worell, l. The effect of goal expectancy upon value. Journal Abnormal and Social Psychology, 1956, 53, 48-53.

APPENDICES

Appendix A

Social Reaction Inventory

This is a questionnaire to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives lettered a or b. Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you're concerned. Be sure to select the one you actually believe to be more true than the one you think you should choose or the one you would like to be true. This is a measure of personal belief: obviously there are no right or wrong answers.

Your answers to the items on this inventory are to be recorded on a separate answer sheet which is loosely inserted in the booklet. REMOVE THIS ANSWER SHEET NOW. Print your name and any other information requested by the examiner on the answer sheet, then finish reading these directions. Do not open the booklet until you are told to do so.

Please answer these items carefully but do not spend too much time on any one item. Be sure to find an answer for every choice. Find the number of the item on the answer sheet and black-in the space under the number 1 or 2 which you choose as the statement most true.

In some instances you may discover that you believe both statements or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you're concerned. Also, try to respond to each item independently when

making your choice; do not be influenced by your previous choices.

Remember

Select that alternative which you personally believe to be more true.

I more strongly believe that:

1. a. Children get into trouble because their parents punish them too much.
   b. The trouble with most children nowadays is that their parents are too easy with them.
2. a. Many of the unhappy things in people's lives are partly due to bad luck.
   b. People's misfortunes result from the mistakes they make.
3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
   b. There will always be wars, no matter how hard people try to prevent them.
4. a. In the long run people get the respect they deserve in this world.
   b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5. a. The idea that teachers are unfair to students is nonsense.
   b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
6. a. Without the right breaks one cannot be an effective

leader.

b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try some people just don't like you.

b. People who can't get others to like them don't understand how to get along with others.

8. a. Heredity plays the major role in determining one's personality.

b. It is one's experiences in life which determine what he is like.

9. a. I have often found that what is going to happen will happen.

b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.

b. Many times exam questions tend to be so unrelated to course work that studying is useless.

11. a. Becoming a success is a matter of hard work, luck has little to do with it.

b. Getting a good job depends mainly on being in the right place at the right time. .

12. a. The average citizen can have an influence in government decisions.

b. This world is run by the few people in power, and there is not much the little guy can do about it.

13. a. When I make plans, I am almost certain that I can make them work.

    b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. a. There are certain people who are just no good.

    b. There is some good in everybody.

15. a. In my case getting what I want has little or nothing to do with luck.

    b. Many times we might just as well decide what to do by flipping a coin.

16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.

    b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.

17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.

    b. By taking an active part in political and social affairs the people can control world events.

18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.

    b. There really is no such thing as "luck."

19. a. One should always be willing to admit his mistakes.

    b. It is usually best to cover up one's mistakes.

20. a. It is hard to know whether or not a person really likes you.

b. How many friends you have depends upon how nice a person you are.

21. a. In the long run the bad things that happen to us are balanced by the good ones.

b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. a. With enough effort we can wipe out political corruption.

b. It is difficult for people to have much control over the things politicians do in office.

23. a. Sometimes I can't understand how teachers arrive at the grades they give.

b. There is a direct connection between how hard I study and the grades I get.

24. a. A good leader expects people to decide for themselves what they should do.

b. A good leader makes it clear to everybody what their jobs are.

25. a. Many times I feel that I have little influence over the things that happen to me.

b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. a. People are lonely because they don't try to be friendly.

b. There's not much use in trying too hard to please people, if they like you, they like you.

27. a. There is too much emphasis on athletics in high school.

b. Team sports are an excellent way to build character.

28. a. What happens to me is my own doing.

b. Sometimes I feel that I don't have enough control over the direction my life is taking.

29. a. Most of the time I can't understand why politicians behave the way they do.

b. In the long run the people are responsible for bad government on a national as well as on a local level.

Appendix B

The figure and adjective pairings for each trial are presented below. In those trials on which the Ss were correct no alternative explanations were ever offered or requested. The explanations for those cards on which the S was to be negatively reinforced no matter which card she chose are listed and were given after completion of the experiment.

CARD I

WHICH IS MORE ALERT

CARD II

WHICH IS MORE FRIENDLY

If S chose the left figure, she was told that children chose the right figure because it looked softer and not like it was reaching out to grab them.

If S chose the right figure, she was told that children preferred the left one because it looked more outgoing than the one on the right.

CARD III

WHICH IS MORE GENEROUS

If S chose the left figure, she was told that children preferred the right because it looked bigger and friendlier.

If S chose the right figure, she was told that children felt the left looked like it had given up more than the larger right figure and was, therefore, more generous.

CARD IV

WHICH IS MORE CURIOUS

CARD V

WHICH IS MORE POWERFUL

If S chose the left figure she was told that the larger triangle with the pointed edges looked more powerful than the smaller circle with smooth edges.

If S chose the right figure she was told that the black color of the circle made it look more solid and powerful than the white color of the triangle.

CARD VI 

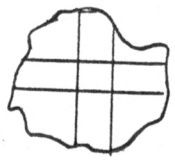
WHICH IS MORE STUBBORN

CARD VII 

WHICH IS MORE AGGRESSIVE

If S chose the figure on the right she was told that the red color of the circle made it look more aggressive than the white color of the triangle.

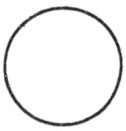
If S chose the figure on the left, she was told that the larger triangle with the pointed edges was more aggressive than the smaller circle with smooth edges.

CARD VIII  

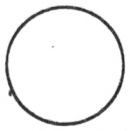
WHICH IS MORE CREATIVE

If S chose the figure on the left, she was told that the circle looked more confined than the figure with the squiggley perimeter.

If S chose the figure on the left, she was told that the smooth circle looked neater than the uneven circle so children chose it as the more creative.

CARD IX  

WHICH IS MORE SELF-CONFIDENT

CARD X  

WHICH IS MORE PASSIVE

CARD XI 

WHICH IS MORE INTELLIGENT

If S chose the rigure on the left, she was told that the children felt the extra slot of the right hand figure made it look more complex and thus more intelligent to children.

If S chose the right figure, she was told that the symmetry of the left hand figure made it look more intelligent.

CARD XII 

WHICH IS MORE CAREFREE

CARD XIII 

WHICH IS MORE ORGANIZED

Appendix C

Instructions

We are doing a series of experiments to determine whether or not it is possible for college women to predict a child's responses to a children's personality test. The test consists of a series of paired geometrical figures and the child is asked to select the figure that is more friendly, aggressive, etc.

(For Skill Group only) Previous studies have shown that some people have a special skill or ability that enables them to predict the child's responses consistently better than others. In fact, some Education Boards are now using a procedure similar to this as part of their selection process in order to hire teachers who will be more understanding and effective with children.

(For Chance Group only) Previous studies have shown that there is no special ability or skill that enables one to predict the child's responses. In fact, Education Boards that previously used them now refuse to use such a test in their selection of teachers because the results are entirely due to chance or luck factors. Although the results are due to chance factors, we have asked you to participate in this experiment in order to complete design requirements of an experiment sponsored by a government grant.

This is how the test will run. I will give you a series of 13 cards. Each card will contain two geometrical figures and I will ask you to judge which of the two figures was chosen as more friendly, aggressive, etc., by the children. In each case I will

tell you if your judgment is correct or not. At the end of the test I will explain the children's responses to any of the figures you do not judge correctly. Do you have any questions?

Another thing, we are also interested in how confident you feel about your judgment. Therefore, before you look at each card, I will ask you how confident you are of making the correct judgment. You can indicate this on a number scale ranging from 0 to 10. For example, if you feel very confident you might rate yourself with a 9 or 10. If you feel only moderately confident that you will be correct, you might rate yourself with a 5 or 6. And, if you feel fairly sure that you will not be correct, you might rate yourself with a 0 or 1. You may use any number from 0 to 10 to indicate how confident you are. Remember to be as realistic as possible and avoid wishful thinking or under-estimating to protect yourself. One final note - I will also be keeping track of how long it takes you to complete this test. There is no time limit, however, and you may take as much time as you want.

(For Skill Group only) Although the judgments required here can be very difficult, we have found that many people are highly skilled at this task and do consistently better than others. The results depend entirely upon your ability. Do as well as you can, and we will see how much skill you have at this.

(For Chance Group only) Although the judgments required here are at a level which makes a correct judgment entirely a matter of chance, some people are lucky and make a number of

correct choices. Do as well as you can, and we will see how lucky you are at this.

(After Trial 6, for Reward Groups only) Now we would like to get an idea of what effect incentive has on your performance. In order to gauge the effect of reward on performance, we will do the following: If you are successful in making the correct judgment on either of the next two cards, we will give you four extra experimental points. This procedure has been approved by the chairman of the department as well as your individual instructor. Remember, make the correct judgment and we will give you four extra experimental points.

EFFECTS OF REWARD ON REINFORCEMENT VALUE AND EXPECTANCY STATEMENTS FOR INTERNAL AND EXTERNAL SUBJECTS IN SKILL AND CHANCE SITUATIONS

by

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The present study is a direct continuation of the work by Phares (1965) and Rotter and Mulry (1966). Phares studied the degree to which introducing a reward in skill and chance situations influenced expectancy. Since the skill situation is a challenge to Ss competency and a chance situation is not, Phares hypothesized that there would be a decrement in expectancy for the skill group and no change for the chance group. The hypothesis was not confirmed. Instead, Ss in both situations showed a decrement in expectancy following the introduction of reward. Post hoc., Phares hypothesized that the use of the Stromberg Dexterity Test as the experimental task may have prevented Ss from perceiving the task as entirely controlled by chance factors.

Rotter and Mulry used a skill-chance dichotomy with internal and external Ss in both situations. They found that internals had longer reaction times than externals in the skill situation, and that externals had longer reaction times than internals in the chance situation. They therefore concluded that internals place a higher reinforcement value on the skill situations as opposed to the chance situation and that externals place higher reinforcement value on chance situations as opposed to the skill situations.

The present experimental situation employed a novel task to avoid the iherent skill nature of the Stromberg Dexterity Test, and used both internal and external Ss in skill, chance, and ambiguous situations. Bothe expectancy statements and decision time were used as dependent variables.

The major predictions concerned with expectancy were:

1. Introduction of reward following a success experience should result in a decrement in expectancies in the skill situation and no change in the chance situation relative to the nonreward controls.

2. Following the introduction or reward, internals in the skill situation should show a decrement in expectancies and externals in the skill situation should show no change. Externals in the chance situation should show a decrement in expectancies and the internals no change.

The major predictions concerned with decision time, or reinforcement value, were:

1. Following the introduction of reward, decision time should increase more in the skill than chance situation relative to the nonreward controls.

2. Internals should show an increase in decision time following the introduction of reward in the skill situation and no change in the chance situation. The opposite was held for external Ss.

Although none of the major predictions were confirmed, it was found that failure to obtain a reward increased the reinforcing value of the skill situation over the chance situation and that internals react defensively by lowering their expectancies for success in both skill and chance situations following failure. Externals, on the other hand, appeared to be free of responsibility for failure in both situations.