BLANKENSHIP, Dumont Gary, 1942-
THE EXPERIENCE OF CONTROL AND
ITS EFFECT ON BEHAVIOR IN SITUATIONS
OF VARYING DEGREES OF CONTROL.

University of Arizona, Ph.D., 1969
Psychology, clinical

THE EXPERIENCE OF CONTROL AND ITS EFFECT

ON BEHAVIOR IN SITUATIONS OF VARYING

DEGREES OF CONTROL

by

Dumont Gary Blankenship

———————————

A Dissertation Submitted to the Faculty of the

DEPARTMENT OF PSYCHOLOGY

In Partial Fulfillment of the Requirements
For the Degree of

DOCTOR OF PHILOSOPHY

In the Graduate College

THE UNIVERSITY OF ARIZONA

1 9 6 9

THE UNIVERSITY OF ARIZONA

GRADUATE COLLEGE

I hereby recommend that this dissertation prepared under my

direction by __Dumont Gary Blankenship__

entitled __THE EXPERIENCE OF CONTROL AND ITS EFFECT ON__

__BEHAVIOR IN SITUATIONS OF VARYING DEGREES OF__ CONTROL

be accepted as fulfilling the dissertation requirement of the

degree of __DOCTOR OF PHILOSOPHY__

_____   7/11/69
Dissertation Director   Date

After inspection of the final copy of the dissertation, the

following members of the Final Examination Committee concur in

its approval and recommend its acceptance:*

_____   June 26, 1969
_____   July 10, 1969
_____   July 14, 1969
_____   July 14, 1969

*This approval and acceptance is contingent on the candidate's
adequate performance and defense of this dissertation at the
final oral examination. The inclusion of this sheet bound into
the library copy of the dissertation is evidence of satisfactory
performance at the final examination.

STATEMENT BY AUTHOR

This dissertation has been submitted in partial fulfillment of requirements for an advanced degree at The University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this dissertation are allowable without special permission, provided that accurate acknowledgment of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the head of the major department or the Dean of the Graduate College when in his judgment the proposed use of the material is in the interests of scholarship. In all other instances, however, permission must be obtained from the author.

SIGNED: _Dumont Gary Blankenship_

ACKNOWLEDGMENTS

TABLE OF CONTENTS

TABLE OF CONTENTS--<u>Continued</u>

LIST OF TABLES

LIST OF ILLUSTRATIONS

ABSTRACT

The purpose of the research was to explore the effect on behavior of the interaction between the experience of control as a personality variable and as a situational variable. The measures of experience of control as a personality variable were obtained by the scores subjects obtained on two questionnaires. These were the Internal-External Locus of Control Scale (I-E scale) and the Personal Opinion Survey (POS). The situational variable was defined by the instructional set given the subjects. One group was informed the task which they were to perform was so difficult that their results would be due to chance; another group was told that there was some skill and some chance involved in the required task; and a third group was advised that, although difficult, the results of their effort would be due completely to their skill. There were two main performance measures. One measure was the number of correct discriminations obtained on 12 angle-matching trials. The other measure was the subject's estimate, from 0 to 10, of his certainty of making a correct response on each successive trial.

The criteria for the selection of subjects, all introductory psychology students at The University of

Arizona, for the analysis of the performance measures were based on the subjects' scores on the I-E scale and on the POS. Eighteen of the upper one third and 18 of the lower one third from the approximately 60 subjects in each of the three conditions were selected.

It was hypothesized that in the chance condition the externally oriented subjects, that is, subjects scoring on the external pole of the tests, would attain more correct discriminations and have a higher estimate of future performance than would the internally oriented subjects, or subjects scoring on the internal pole of the tests. The internals were hypothesized to attain more correct discriminations and have a higher estimate of future performance in the moderate-skill condition. Thus, there would be a significant personality-by-situation interaction effect. It was also hypothesized that there would be a smaller difference between the internal and external subjects on both performance measures in the high-skill condition. Further, it was predicted that the above-hypothesized results would be found, only more significantly so, for factors 1 and 3 of the POS.

None of the predicted results was significant. It was found that the condition or situational variable was a more powerful determinant of behavior than was the personality variable. It was observed that externals tended to vary their performance across conditions while the

internals were more consistent in their performance. The
tendency of the internal subject to see himself in control
of most situations, the tendency of the internal subject to
be more negatively influenced by attempts to control his
behavior, and the tendency of the internal subject to be
more rejecting of chance instructions were all discussed as
possibly being relevant to the outcome of this research.
The most logical conclusion, however, remained that the
situation actually has more influence on behavior than has
the personality variable.

Besides the relationship of the personality and
situational measures of experience of control to the per-
formance measures, the relationship of the two personality
inventories was also of interest. It was found that there
were low, but highly significant, correlations between the
I-E scale and 16 of the 18 POS factors. This suggested that
the two scales might be measuring some aspects of the same
general variable of experience of control.

INTRODUCTION

The experience of control, which includes the perceptions that one has command of his behavior and the knowledge of the consequences of his behavior, is important to the social and emotional adjustment of the individual. Although experience of control has been of considerable importance to observers of behavior for many years, the systematic investigation of this variable has been undertaken only recently.

Most of the research to date has had its origin and theoretical basis in the social learning theory of Julian Rotter (1954). Rotter and his students discovered that a subject reacted differently to reinforcement, depending upon whether he perceived the reinforcement as contingent upon his action or whether the reinforcement was perceived as only following his action but dependent upon some external force, thus having little to do with his action (Rotter, 1966).

From these experiments was derived the construct of locus of control. The two poles of the internal-external locus of control dimension were consequently defined in relation to the perception of the contingency of the reinforcement to the person's behavior. In essence, the variable

1

entails whether reinforcement appears to be controlled by people or forces outside the individual and thus is a matter of chance, hence external; or whether the reinforcement is a function of a quality or characteristic which can be defined as skill, hence internal (Rotter, Seeman, and Liverant, 1962).

Locus of control has been investigated as both a situational and personality or interpersonal variable. As a situational variable, internal-external (I-E) control has been operationally defined by skill and chance situations. The skill or chance definition of the task was usually given to the subject by the experimenter in his instructions (Holden and Rotter, 1962; James and Rotter, 1958; Phares, 1957, 1962). Tasks culturally defined as skill and chance have also been used (Rotter, Liverant, and Crown, 1961).

As a personality variable I-E has been operationally defined as a score on one of the many scales which has been developed over the years. The scale now in use is a 29-item scale which Liverant, Rotter, and Crown refined from a longer scale (Rotter, 1966). The scores obtained from these scales have been found to relate to effectiveness as a hospital volunteer (Hersch and Scheibe, 1967), and to the constructiveness of one's attempts to change or control the environment, such as in hospitals (Seeman and Evans, 1962), in institutions (Seeman, 1963), and in society (Gore and Rotter, 1963; Strickland, 1965).

The individual's preference for certain types of situations and the differential performance have also been investigated in relation to the experience of control variable. New methods of assessing this variable have also been devised. It is from these investigations that the hypotheses for the present research were derived.

Preferences

The relatively recent investigations of the interaction between the personality and situational variables of locus of control have led to an important finding concerning the differing task preferences of internals (I's) and externals (E's). There is a tendency for I's to prefer skill tasks and for E's to prefer chance-oriented tasks. For example, Cromwell, Rosenthal, Shakow, and Zahn (1961) found that their normal subjects, as compared to their schizophrenic subjects, were significantly more internally oriented and preferred an autonomous task to a controlled task. The autonomous task allows the subject to exercise more control and thus is seen as more of a test of skill than the other task, which was experimenter-controlled. Similar results were obtained by Lichtman and Julian (Lefcourt, 1966, p. 215), who used a dart-throwing game as the task. They found that when "the conditional probabilities of success were equated at the two distances, though they differed in the degree of actual control that

the subject could probably exert over the outcome (Lefcourt, 1966, p. 215)," the internals chose the alternative which would give them the most control. The external subjects, on the other hand, preferred the alternative in which their score was more a matter of chance. The preference of internals for skill tasks and of externals for chance tasks was also reported by Schneider (1968). However, he noted that this relationship held only for male subjects. It thus appears from the research of Cromwell et al. (1961), Litchman and Julian (Lefcourt, 1966, p. 215), and Schneider (1968) that one's preference for a skill or chance task may be determined by whether one sees the reinforcement he receives as contingent upon his behavior or as a matter of chance. Consequently, it is important to understand and investigate why the preference exists and particularly to find whether it is based on actual performance in these situations.

Performance and Locus of Control

One hypothesis to account for the differential preference would be that internals actually perform better in a skill situation and externals perform better in a chance situation. Utilizing gambling as a risk-taking, chance-oriented task, contrasting results were obtained by Lefcourt (1965) and Liverant and Scodel (1960). Lefcourt found that Negroes, E's, were less risk-taking and chose fewer

low-probability bets than did the whites, I's. Conversely,
Liverant and Scodel (1960) found the I's choosing fewer low-
probability bets and taking fewer risks than the E's. Using
reaction time as a performance criterion, Cromwell et al.
(1961) found that normal subjects who were more internal
did better in the condition in which they had the most con-
trol, or skill condition. The schizophrenic patients did
better in the situation in which they had less control, or
chance condition. The same trend was noted among the
normals, with the higher I's scoring better the more control
they exerted. Rotter and Mulry (1965) also found that in-
ternals responded in a more adaptive manner when they were
in a skill situation than when they were in a chance situa-
tion. The opposite was true for externals. Specifically,
using an angle-matching task as the performance measure,
they found that the decision time was longer for internals
when they were told the task was a skill than when they were
told it was a matter of luck. Externals had a longer de-
cision time when they were told the task was luck. Simi-
larly, Julian and Katz (1968) found that internals and
externals reacted differently in a skill situation, with
the internals being more self-reliant. However, they also
found that in a chance situation, when it was more profitable
to rely on another subject's decision, the internals were
still more self-reliant. Consequently, in the chance

situation the internals did not attempt to maximize their score as much as did the externals. Further support for the differential performance is given by Davis and Phares (1967). They found that in both a skill and ambiguous situation, the I's reacted in a more adaptive manner. Although they did not find a significant difference in the chance situation, there was a trend for the external subjects to behave more adaptively. Lipp, Kolstoe, James, and Randall (1968) have also noted that externality may be adaptive in some situations. They found that those subjects who scored in the middle range of the I-E scale and those with high internal scores were more denying of personal disability than those whose scores were highly external. This denial usually leads to a longer period of maladaptive behavior than when the disability is accepted. This, in turn, suggests that internals, when placed in a situation where events are controlled externally, may react in a more maladaptive manner than those who believe events are externally controlled.

The above research indicates that the difference in the preferences of the internal and external individuals for skill and chance tasks may actually be due to differing performance levels. Therefore, it is hypothesized that on a task such as angle-matching, the internals will make more correct discriminations in a skill condition and the externals will make more correct discriminations in a chance

condition. If this assumption is correct, and if the subjects are aware of their abilities in these conditions, then their performance estimates should be congruent with their actual performance and vary with that performance.

Level of Condition

Rotter (1966, p. 2) in his review of the I-E construct noted: "From social learning theory one would anticipate that the more clearly and uniformly a situation is labeled as skill or luck determined, in a given culture, the lesser the role such a generalized expectancy would play in determining individual differences in behavior." Feather (1967) had also found that when the situation was highly structured, so that success or failure was obviously due to skill or chance, personality variables such as locus of control had little effect on behavior. This same conclusion could be reached from the research of McDonald, Tempone, and Simmons (1968). They utilized two levels of difficulty in the task and two levels of feed-back to induce high and low levels of control. There was a large degree of difference in task difficulty and a wide discrepancy in the number of errors the subjects were informed they had made. Consequently, the lack of results on the I-E variable in this study may have been due to the extreme levels of control. Lefcourt (1967) found that on a task which could be interpreted as skill (Level of Aspiration Board), internals were

consistent in their performance regardless of the cues given,
but externals acted less and less externally as the task was
defined more and more in terms of skill. In fact, in the high-
skill condition, the externals exceeded the internals. The
above results would indicate that when a task is defined as
skill to such an extent as to remove all doubt, the I-E
variable loses some of its predictive power. It is, there-
fore, hypothesized that when it is made explicit that the
task is completely skill-determined, the differences between
the performance levels will decrease; that is, there will be
a larger difference in performance when a task, an angle-
matching task, is believed to be due to chance or only
moderately due to skill than when the subjects believe the
task is completely skill-determined.

Methods other than the I-E scale have been introduced
to predict performance such as that described above.

New Method of Assessing Experience of Control

As previously noted, most of the significant re-
search concerning the experience of control had been ini-
tiated within the framework of social learning theory.
Consequently, the instruments constructed to measure this
variable have emphasized expected reinforcement and control
in the social realm (Coan, 1968). Although the social learn-
ing theory construct has been utilized to predict behavior
in many areas, the I-E scale is limited by its theoretical

basis. Coan (1968) devised the Personal Opinion Survey
(POS) in order to broaden the definition of experience of
control and, consequently, to make the variable more pertinent
to a wider variety of behaviors. In an unpublished manu-
script (1969), he defines experience of control as "the
sense that one actively chooses, successfully wills, or
achieves mastery over himself and the circumstances in which
he finds himself." To better measure this, he developed
a 130-item, true-false scale which was found to contain 18
distinguishable factors. The content of this scale en-
compasses three broad areas. These are external events,
personal characteristics, and the body. This is in con-
trast to the I-E scale which is primarily concerned with
external events. The multidimensional aspect of the POS
thus presents a broader base from which to predict behavior.
If behavior, such as that to be measured in this study, is
determined by factors other than a unitary dimension of a
generalized expectancy, then the various factors should have
a higher relationship with the performance measures than the
I-E scale. Due to the recent development of the POS the use
of the scale in the present research will be primarily ex-
ploratory in nature. However, two of the factors,
factor 1 which is labeled "achievement through conscious
effort," and factor 3, called "capacity of mankind to con-
trol its destiny vs. supernatural power or fate," are

hypothesized to have greater predictive power than the I-E scale.

Of secondary interest in this study will be the relationship of the two scales, that is, the correlations of the I-E scale and various factors of the POS.

As has been noted above, the perception of the situation as skill or chance and the subject's own experience of control interact to determine his behavior. In accordance with the research which has been presented, the following hypotheses have been advanced.

Restatement of Hypotheses

1. The actual performance of the subject will be relative to the personality-situation interaction; that is, the external subjects will make more correct responses than will the internal subjects in the chance condition. The internal subjects will have more correct responses in the moderate-skill condition than will the external subjects. (A correct response is made by selecting one of the two equidistant non-adjacent angles.)

2. The estimates of future performance will also be dependent upon the personality-situation interaction. The internals will have a higher over-all estimation level in the moderate-skill

condition than will the externals; the externals will have a higher over-all estimation level in the chance condition.

3. The difference in estimation and performance between the externals and internals will not be as great in the high-skill condition as it will be in the moderate-skill and chance conditions.

4. There will be a more significant relationship between test behavior and task behavior in the predicted directions (Hypotheses 1 through 3) for factors 1 and 3 of the POS than for the I-E scale.

METHOD

Subjects

The subjects were 194 student volunteers enrolled in introductory courses at The University of Arizona. Of this group, 184 subjects completed the I-E scale and the angle-matching task and were included in the subject pool for the I-E portion of the study. The subjects were categorized as internal (I) or external (E) on the basis of their scores in their respective groups (see Procedure section); that is, 18 of the lower and 18 of the upper one third of each group have been designated as internals and externals, respectively. The groups were matched on their I-E scores (Appendix A).

Of the subjects who completed the I-E scale and the angle-matching task, 181 also completed the POS. Conclusions concerning the POS will be based upon this sample. The same procedure used in selecting subjects on the I-E variable was utilized in selecting subjects for the analysis of variance of the POS factors. The age of the subjects ranged from 18 to 48 (mean = 20.06 years).

Experimental Measures

Personality Questionnaires

The construct of experience of control was measured by two different personality inventories. The internal-external control dimension was obtained from the 29-item, forced choice I-E scale (Rotter, 1966).

Another method for assessing the experience of control variable, the POS scale, was also employed. The POS is a 130-item, true-false, factor analytic scale developed by Coan (1968). The scale measures 18 factors. The two factors with which this study is most concerned are factors 1 and 3. These are defined by Coan (1969) as follows:

Factor 1
Most of the items loaded highly by this factor are stated in the third person. They generally express the view that one can accomplish many things if one tries hard enough. Success may lie in the academic, social, or physical realm. We may call this achievement through conscientious effort.

Factor 3
This may be called capacity of mankind to control its destiny vs. supernatural power or fate. The items refer to man's ability to build a just society, to control both his own evolution and natural physical phenomena, and the possibility of acting to eliminate war.

For a complete list of the 18 factors and their definitions, see Appendix B.

Angle-matching and Estimation

An angle-matching task and estimates of future performance much like those employed by Rotter and Mulry (1965) were utilized as the performance measures.

The angle-matching task consisted of 12 angle-matching trials. On each trial the task was to select an angle from a group of sample angles which most nearly matched a standard angle. Each set of angles was placed on a separate 5-1/2- x 8-1/2-inch card. The 12 cards and a face sheet with instructions concerning the angle-matching task and estimation task (Appendix C) made up a booklet. On the left-hand column of each card was a standard angle. The seven sample angles were on the right-hand column of each card. The task was to select the angle on the right which was most like the standard angle on the left. The standard angle varied from 27.5 degrees to 102.5 degrees.

None of the sample angles actually matched the standard angle. Two of the angles, however, were equidistant from the standard; i.e., one was +2.5 degrees from the standard and another was -2.5 degrees from the standard. The other angles varied from ± 4.5 degrees to ± 7.5 degrees from the standard. A correct response was scored if the subjects picked either of the two angles which were closest to the standard.

On six of the trials, the apex of the standard and the apices of the sample or matching angles were facing the same direction. On the other half of the trials, the apex of the standard was rotated 90 degrees from the apices of the matching angles. The lengths of the sides of the angles also varied. The task was thus seemingly so difficult that either a chance- or skill-orientation to the task could be induced by the experimenter.

The other performance measure was an estimate of future performance. The subjects were asked to state their estimate of the probability of their being correct on the next trial immediately upon completing the previous trial. The estimate could range from 0 to 10 depending upon one's confidence in his ability. Zero was equal to no confidence or expectancy. The subjects were to place this estimate in the box labeled "est." This box was placed below the standard angle on the left-hand column of the page in the booklet.

Procedure

The subjects were administered the tests and tasks in their respective psychology classes during regularly scheduled class periods. The same tests and tasks were given to all classes in the same order. The three conditions--chance, moderate-skill, and high-skill--were determined by the instructional set induced by the

experimenter. In order to make the norms seem more realistic, fictitious norms were given to the subjects. The size of the classes was such as to include approximately the same number of students in each group. Of the 184 subjects utilized in the I-E portion of the study, 61 had been given chance instructions, 62 moderate-skill instructions, and 61 high-skill instructions. When the administration of the study began, each subject was given the angle-matching task booklet and the two questionnaires. The following instructions, portions of which were taken from Rotter and Mulry (1965, pp. 598-604), were then read to the subjects:

> We are doing a series of experiments to test visual discrimination under conditions of perceptual confusion. In this experiment we are concerned with judgments of degrees of angles when the differences between them are small and when there are a number of confusing elements present.
>
> 1. Continuing instructions for Chance Group only:
> We have found that under these conditions, when the discriminations are so difficult, that success is entirely a matter of chance. For example, in the studies reported at Ohio State University the majority of the subjects got only two of the twelve discriminations correct. Although there was some variation in the results, studies from the University of North Carolina and the University of Florida report essentially the same percentage.
>
> 2. Continuing instructions for Moderate-Skill Group only:
> We have found that some people have a special skill for this task and do consistently better than others. For example, in a study conducted at Ohio State University about 50 per cent of the subjects made the correct discrimination a significant majority of the time. The rest scored a chance level. Results obtained at the

University of North Carolina and at the University
of Florida were essentially the same.

3. Continuing instructions for High-Skill Group
only:
Although the discriminations I am going to ask
you to make are difficult, most people are skill-
ful enough to make a majority of the discrimina-
tions correctly. The task depends entirely on
your skill. For example, at Ohio State University
90 per cent of the subjects matched a significant
majority of the angles correctly. Results obtained
at the University of North Carolina and the Uni-
versity of Florida were essentially the same.

4. The following instructions were then read to
all groups:
The way in which the test works is as follows:
You have been given a booklet. On each page
of the booklet there is a series of angles. On
the left-hand side of the page there is one large
angle. On the right-hand side of the page there
are seven smaller angles. You are to take your
pencil and cross out the angle on the right which
is most like the angle on the left. (A demonstra-
tion is given on the blackboard.) Please make all
of your choices visually; do not use any mechanical
means.
Do you have any questions?
The task, of course, is to make as many correct
responses as you can in order to make a high score.
You will be told at a later time your total score
and how well you did in relation to other people.
Now, there is another factor which can affect
your total score. Besides scoring the angles you
get right, I am also interested in how accurately
you predict how well you will do on each trial.
After each trial I would like you to state what
you feel the probability is of your being right
on the next trial. You can rate this from 0 to
10. For example, if you feel sure that you will
be right you would state a high number like 9 or
10. If you feel only moderately sure that you
will be right, you would state a lower number
like 5 or 6. If you feel that you will not be
right, you would state the lowest numbers like
0 or 1. Consider these numbers as being esti-
mates of your degree of confidence in the task.
If you are right on the trial the number you
state will be added to your total score. If

you are wrong on the trial, the number will be
subtracted from your total score. From this
you can see that it is very important for your
estimate to correspond closely with how you
feel you will do. Make your estimate of the
next trial in the box below the large angle.
Make your first estimate on the face sheet of
the angle-matching task. Use the information
you now have available to make this decision.
Do you have any questions?

1. For Chance Group only:
Although the discriminations required here
are a matter of chance, some people are lucky
and obtain high scores. Others do miserably
and obtain low scores. Do as well as you can
and see how lucky you are.

2. For Moderate-Skill Group only:
Although the discriminations are difficult,
some people display considerable skill at this.
Others performed at a chance level.

3. For High-Skill Group only:
Although this set of discriminations is
difficult, most people are able to obtain con-
sistently high scores. The results will depend
entirely on your skill.

4. The following instructions were then read to
all groups:
When you have finished the angle-matching
task, please fill out the personality question-
naire.

Neither reinforcement nor feed-back was given the

subjects during the experiment. The subjects were given

the scores which they attained on the angle-matching task

several weeks after the experiment. At that time, they

were also informed of the purpose and design of the research.

RESULTS

Results of the Discrimination Task

In order to determine the effect the personality
and situational variables of experience of control had on
performance, a 2 x 3 (I-E x condition) analysis of variance
was applied to the total number of correct discriminations
of angles (Table 1). It had been predicted that there
would be an interaction effect. The analysis of variance,
however, revealed a condition effect ($F = 4.265$, $p = .025$)
but the interaction effect was not significant ($F = .989$,
$p = .50$). As Figure 1 indicates, the direction of the
proposed results was consistent with the actual direction
of obtained results in the chance and high-skill conditions,
but not in the moderate-skill condition. Although it was
hypothesized that the smallest degree of difference between
the I's and E's would be in the high-skill condition, an
inspection of Figure 1 indicates that the difference here
was greater than in the other conditions. The difference,
however, was not significant ($F = 2.676$, $p = .25$).

The angle-matching task can be broken into two
parts: (1) in one-half of the angles, the apex of the
standard and apices of the sample angles were pointing in
the same direction (easy discriminations); and (2) in the

TABLE 1

Analysis of Variance for the Total Number
of Correct Discriminations of Angles

Source	df	MS	F	p
Between Groups	(5)			
Internal-External (I-E)	1	1.120	.409	
Condition (C)	2	11.67	4.265	.025
I-E x C	2	2.701	.989	.50
Within Groups	102	2.736		
TOTAL	107			
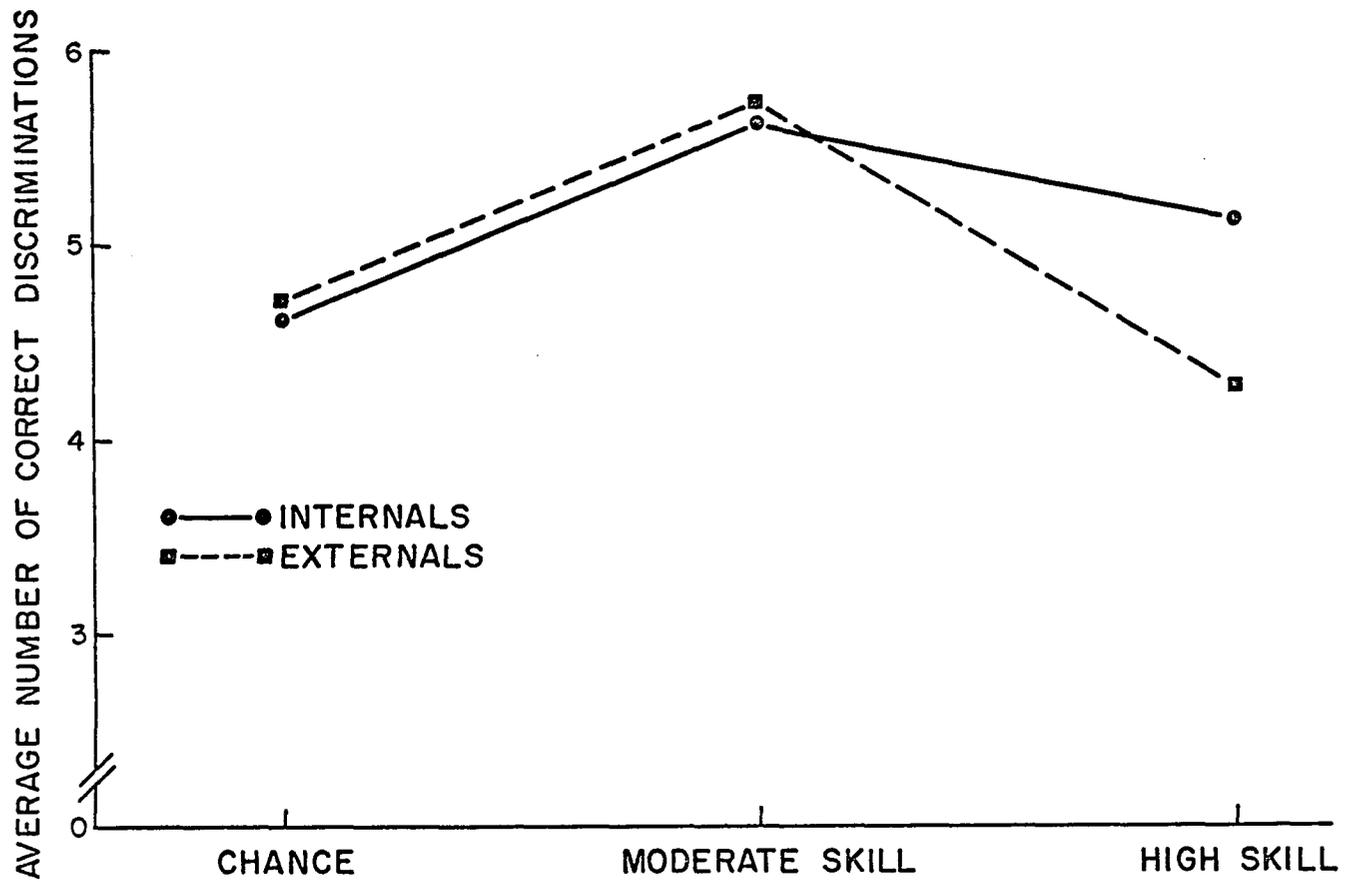
Fig. 1. Average Number of Angles Correctly Discriminated by Internals and Externals in the Chance, Moderate-Skill and High-Skill Conditions.

other half, the apex of the standard angle was rotated 90
degrees from that of the sample angles (hard discrimina-
tions). Even though the difference between the standard
and matching angles remained constant, the subjects, as
shown in Table 2 and in Figure 2, made significantly more
correct responses when the apex of the standard and those
of the samples were pointing in the same direction
(F = 120.991, p = .001). Again, the condition effect was
significant (F = 4.267, p = .025). This condition effect
seems to result from differences in the performance of the
subjects when faced with the more difficult discriminations.
There was no significant difference in discriminations of
the easy angles across conditions (F = 1.09, p = .50).
There is a significant condition effect, however, when the
difficult discriminations are taken into consideration
(F = 3.6, p = .05). The significant condition effect for
the more difficult discriminations can be attributed to the
rather variable response rate of the E subjects. Although
the I's displayed no significant change across conditions
(F = 1.696, p = .25), there was a significant change in
the E's (F = 4.37, p = .025). This same tendency for the
E's to be more variable and for the I's to be more con-
sistent across conditions is also attributed to the condition
effect obtained when the total number of discriminations are
considered; that is, the E's changed more (F = 4.10, p = .025)

TABLE 2

Repeated Measures Analysis of Variance
of Easy vs. Hard Angles

| Source	df	MS	F	p
Between Groups	(107)			
Internal-External (I-E)	1	.56	.409	
Condition (C)	2	5.838	4.267	.025
I-E x C	2	1.338	.978	.50
Error (b)	102	1.368		
Within Groups	(108)			
Types of Angles (A)	1	176.042	120.991	.001
A x I-E	1	.042	.28	
A x C	2	.541	.371	
A x I-E x C	2	1.097	.753	.50
Error (w)	102	1.455		
TOTAL	215			
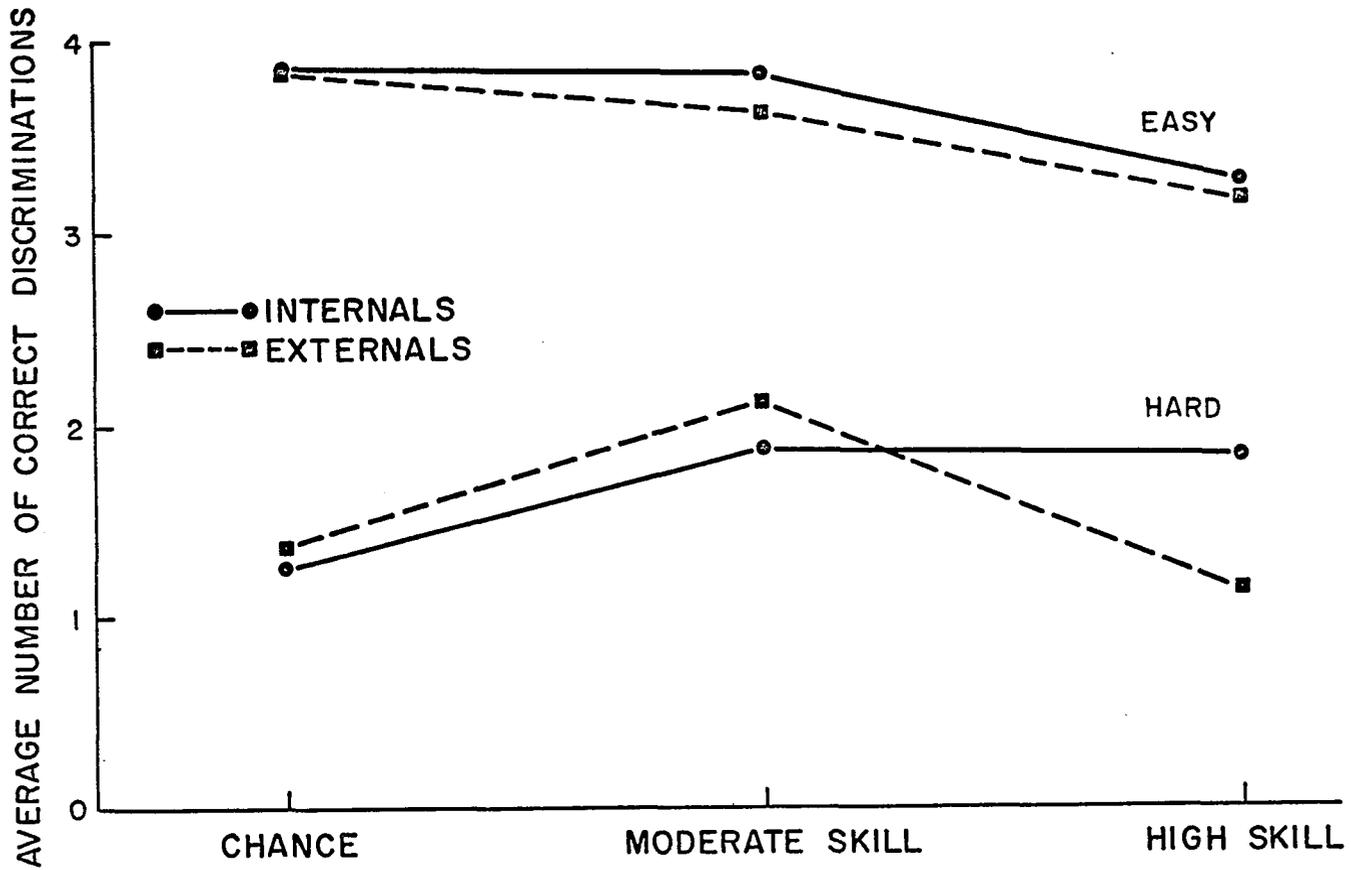
Fig. 2. Average Number of Hard and Easy Angles Correctly Dis-
criminated by Internals and Externals in the Chance, Moderate-
Skill and High Skill Conditions.

than did the I's (F = 1.468, p = .25). With the exception of the I's discriminating more hard angles correctly than the E's in the high-skill condition (F = 3.65, p = .07), the main difference in the performances of the I's and E's on the angle-matching task seems to be that the I's are less variable in their performance.

Results of the Estimation Task

It was hypothesized that the estimates of future performance of the subjects would be congruent with their performance level. Therefore, the expected results of the estimation task were anticipated to be in the same direction and of approximately the same magnitude as the expected results of the discrimination task. As is evident from the graph of the actual estimates of future performance (Fig. 3), the I's estimates of future performance in the chance situation are greater, though not significantly so, than are those of the E's (F = 3.873, p = .07). As with the angle-matching task, there was no I-E effect (Table 3: F = 2.363, p = .25), but the condition or situational effect was highly significant (Table 3: F = 7.026, p = .005). The same tendency for constancy of the I's and variability of the E's across conditions is noted here as it was in the angle-matching task; that is, there is a highly significant change in the E's score across conditions (Fig. 3; also F = 6.553, p = .005), and no significant shift on the part of the I's (F = 1.553, p = .25).
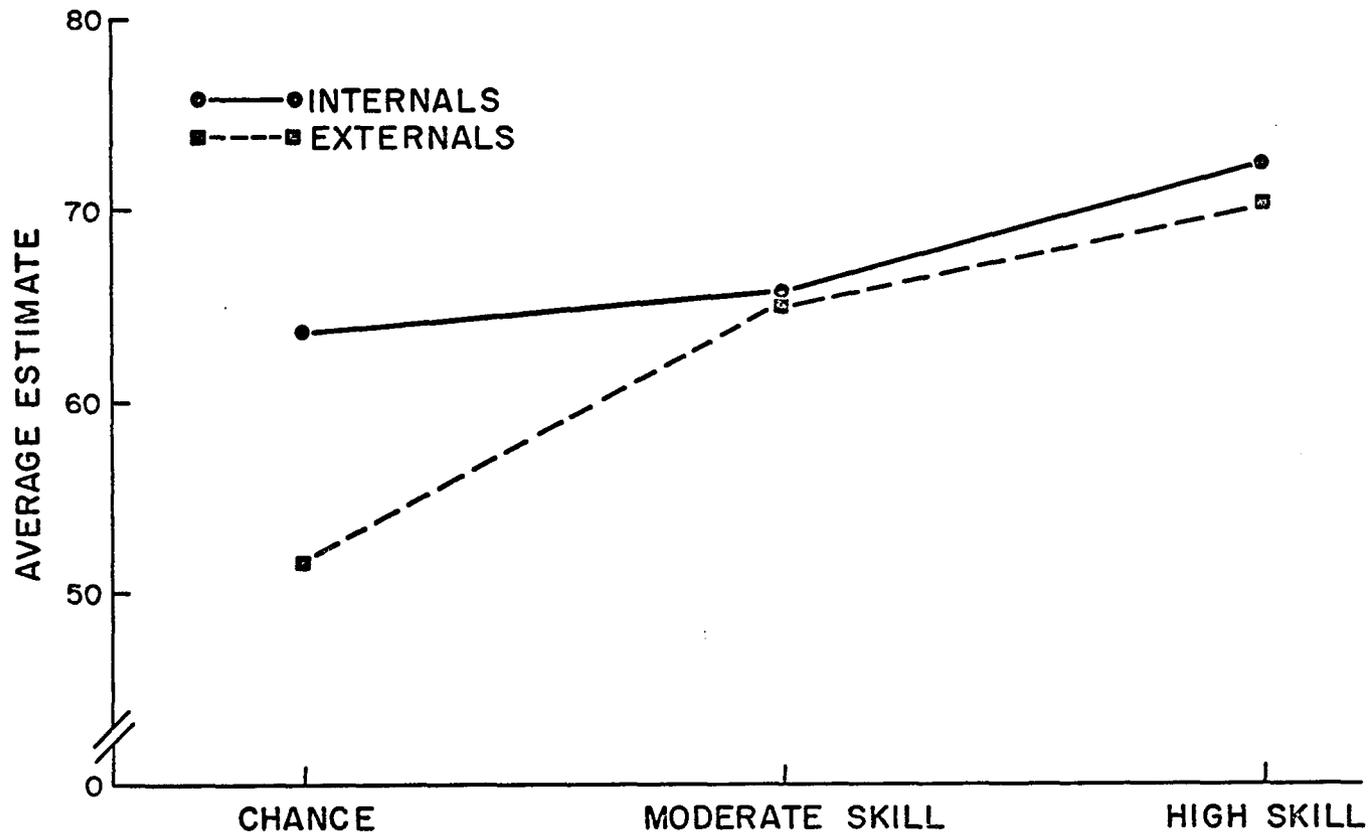
Fig. 3. Average Estimate of Future Performance by Internals and Externals in the Chance, Moderate-Skill and High Skill Conditions.

TABLE 3

Analysis of Variance of the Estimates
of Future Performance 1-11

Source	df	MS	F	p
Between Groups	(5)			
Internal-External (I-E)	1	586.453	2.363	.25
Condition (C)	2	1743.250	7.026	.005
I-E x C	2	364.56	1.469	.25
Within Groups	102	248.099		
TOTAL	107			

There was also a significant tendency for all subjects to change their estimates across trials (Table 4: $F = 3.467$, $p = .005$). These data were obtained from the estimations the subjects made on angles 1 through 11. The last estimate was not used as many subjects did not complete number 12. The change was not exactly like that which one would have expected. There was an initial high estimation followed by a lower estimation. The subjects then increased their estimates until trial or angle 6, when they again lowered their estimates. The estimations were then gradually raised throughout the rest of the trials.

The results of the estimates of future performance are consistent with those of the angle-matching task in that the condition effect is more powerful than the personality factor and the fact that the E's are more variable in their behavior.

Comparisons of I-E and POS with Performance Tasks

It was hypothesized that there would be a higher relationship between test behavior and task behavior in the direction predicted by hypotheses 1 and 3 for factors 1 and 3 of the POS than for the I-E scale. In actuality, neither I-E nor factors 1 and 3 of the POS were significantly correlated with the number of correct discriminations in any of the conditions whenever all the subjects in these conditions

TABLE 4

Analysis of Variance of the Estimates
of Future Performance for
Trials 1-11 for I-E

Source	df	MS	F	p
Between Groups	(107)			
Internal-External (I-E)	1	41.859	1.586	
Condition (C)	2	192.851	7.309	.01
I-E x C	2	53.849	2.040	
Error (b)	102	26.385		
Within Groups	(1080)			
Trials (A)	10	6.342	3.467	.005
A x I-E	10	.893	.487	
A x C	20	1.744	.953	
A x I-E x C	20	.874	.477	
Error (w)	1020	1.829		
TOTAL	1187			

were utilized (Table 5). When the estimate of future per-
formance is the performance criterion, there are significant
correlations in the chance condition for both I-E and
factor 1 (Table 6: r = -.307, p = .05 and r = .377, p = .01,
respectively). However, this was not in the predicted direc-
tion. Due to the exploratory nature of the study concerning
the relationship of the POS factors to the present per-
formance measures, the correlations of the other four stable
POS factors (F2, F4, F5, and F6) were also examined. Al-
though neither I-E nor factors 1 and 3 were found to be
correlated with the correct number of discriminations in
any of the conditions, factor 6 was found to be highly cor-
related with this criterion in the high-skill condition
(Table 5: r = -.496, p = .01). As shown in Table 6,
factor 6 was also found to be significantly correlated with
the total estimate of future performance in the chance and
high-skill conditions (r =-.309, p = .05; r =-.438, p = .01).
In order to clarify these correlational relationships, and
to make the POS results more comparable to the previously
reported I-E results, the analysis of variance technique was
applied to the POS data. Although F6 was not originally
hypothesized to be one of the important factors, it was in-
cluded since it had correlated more highly with the per-
formance measures than had the other two factors.

A 2 x 3 analysis of variance was applied to both
the number of correct discriminations and the total estimates

TABLE 5

Correlations of Total Number of Correct Discriminations
of Angles with the I-E Score and Factors 1-6
(F1 through F6) in the Three Conditions:
Chance (C), Moderate-Skill (MS),
and High-Skill (HS)

	I-E	F1	F2	F3	F4	F5	F6
C	.045	.063	.053	-.160	.089	-.039	-.028
MS	-.024	-.176	.177	.069	-.039	-.076	-.093
HS	-.177	-.006	.229	-.065	-.101	-.197	-.496*

*Significant at .01 level

TABLE 6

Correlations of Total Estimate of Future Performance
with I-E Score and Factors 1-6 (F1 through F6)
in the Three Conditions: Chance (C),
Moderate-Skill (MS), and
High-Skill (HS)

	I-E	F1	F2	F3	F4	F5	F6
C	-.307*	.377**	.187	-.122	.055	.154	-.309*
MS	.024	-.027	-.084	.094	.108	-.245	.080
HS	.064	-.086	.253	-.039	.171	-.193	-.438**

*Significant at .05 level

**Significant at .01 level

of future performance of F1, F3, and F6, respectively. To make the analysis of the POS factors comparable to the I-E data, 18 of the upper one third of the subjects and 18 of the lower one third of the subjects in each condition were utilized in the analysis. For F1 and F3 no significant relationships were observed for the personality, situation or interaction terms when the number of correct discriminations was the performance variable. There was, however, a trend for a situation effect (p = .10) for both F1 and F3. On the other hand, for F6 there was a significant personality effect (F = 4.201, p = .005) and a trend toward an interaction effect (F = 2.397, p = .10).

When the estimates of performance are used as the criteria, the results differ. Consistent with the I-E results, all three factors (F1, F3, and F6) demonstrated a significant condition effect (Tables 7, 8, and 9). Not consistent with the I-E data, however, was the observed significant interaction effect in F1 (Table 7: F = 4.52, p = .025) and the significant personality effect found with F6 (Table 9: F = 4.109, p = .05).

Additional Results

The data to be presented in this section were not included in the major hypotheses, but since these data may extend or clarify the preceding results it is important that these results be examined.

TABLE 7

Analysis of Variance of the Estimates
of Future Performance for F1

Source	df	MS	F	p
Between Groups	(5)			
High vs. Low Score on F1 (H-L)	1	151.707	.804	
Condition (C)	2	1238.027	6.562	.005
H-L x C	2	852.898	4.520	.025
Within Groups	<u>102</u>	188.657		
TOTAL	107			

TABLE 8

Analysis of Variance of the Estimates
of Future Performance for F3

Source	df	MS	F	p
Between Groups	(5)			
High vs. Low Score on F3 (H-L)	1	17.926	.071	
Condition (C)	2	2185.195	8.484	.005
H-L x C	2	257.564	1.003	
Within Groups	102	249.943		
TOTAL	107			

TABLE 9

Analysis of Variance of the Estimates
of Future Performance for F6

Source	df	MS	F	p
Between Groups	(5)			
High vs. Low Score on F6 (H-L)	1	873.371	4.109	.05
Condition (C)	2	686.565	3.230	.05
H-L x C	2	397.342	1.786	
Within Groups	102	212.549		
TOTAL	107			

Since the subjects were told they would be ranked on their accuracy scores, these data were utilized as another performance measure. The accuracy score is a combination of the number of correct discriminations and the number obtained by _adding_ the estimate of future performance when the subject successfully discriminates and _subtracting_ the estimate when his next discrimination is incorrect. Again, as with the number of correct discriminations and estimates of future performance, there was a significant condition effect (Table 10: F = 5.444, p = .01). Also consistent with the other findings, the main difference across conditions was due to the response of the E's (F = 8.069, p = .005) and not the I's (F = 1.050, p = .50). A comparison of Figures 1 and 4 reveals that the results of the subjects' accuracy scores closely paralleled the results of the angle-matching task.

Another variable which is associated with the estimates of future performance, and a measure which has been widely used in analyzing the results of I-E research, is the shift variable. Usually the subject has received information concerning the results of the previous trial and the shift is defined by the change in the next estimate. The types of shifts usually described are:

1. Usual shifts--an increase in estimation following positive feed-back or a decrease in estimation following negative feed-back.

TABLE 10

Analysis of Variance of the Accuracy Scores

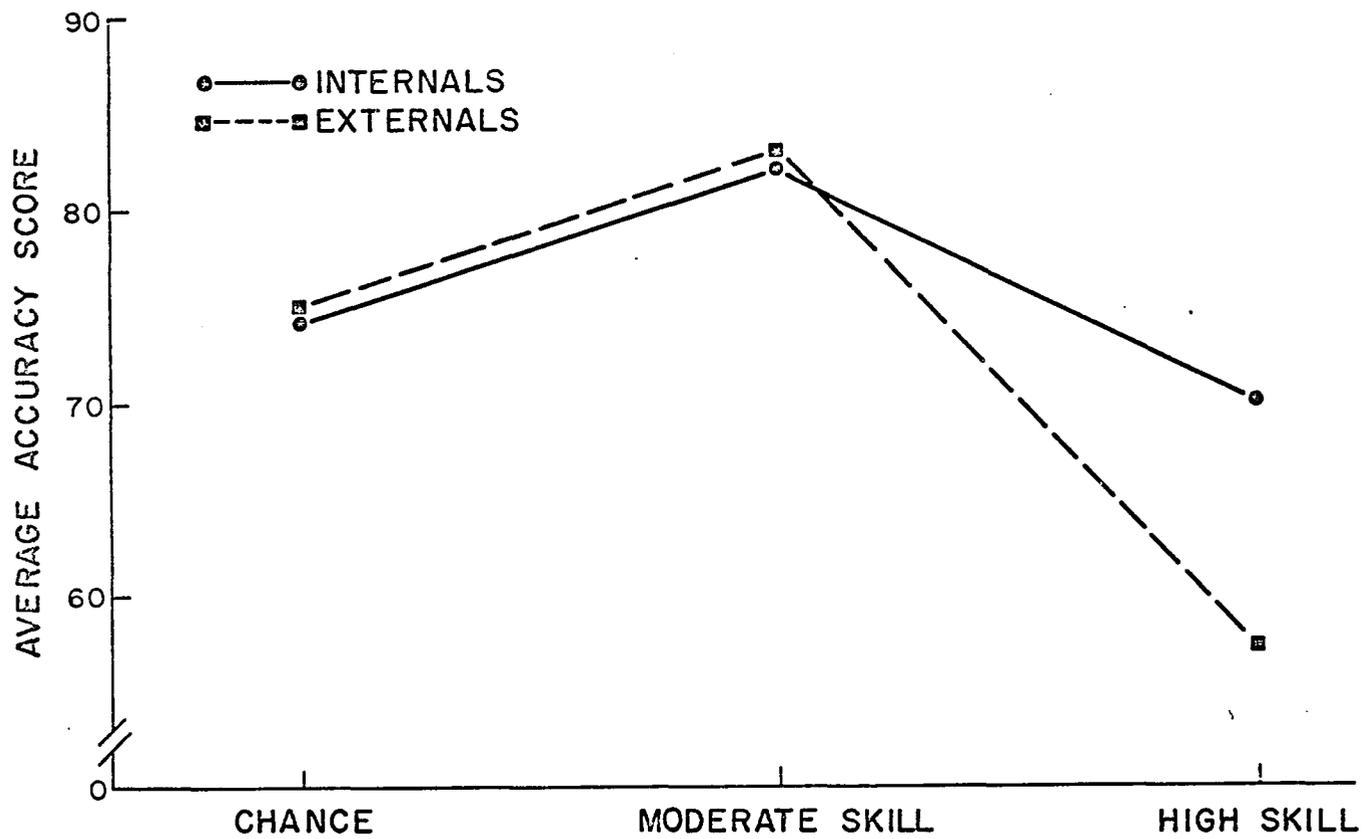| Source	df	MS	F	p
Between Groups	(5)			
Internal-External (I-E)	1	110.83	.194	
Condition (C)	2	3102.287	5.444	.01
I-E x C	2	710.877	1.247	.50
Within Groups	102	569.771		
TOTAL	107			

Fig. 4. Average Accuracy Score of Internals and Externals in the Chance, Moderate-Skill and High-Skill Conditions.

2. Unusual shifts--a decrease in estimation follow-
    ing positive feed-back or an increase in estima-
    tion following negative feed-back.

3. Abnormal shifts--an increase or decrease of
    great magnitude.

4. Total shifts--the total number of shifts or
    changes in estimation made regardless of type
    or direction.

Since the subjects were not given any feed-back during the
experiment, only the last two, abnormal shifts and total
shifts, were deemed appropriate for analysis. A 2 x 3
analysis of variance revealed that the personality variable
(I-E) had more effect on the amount of shifting than it had
on most of the other performance levels (Table 11: $F = 3.55$,
$p = .07$). The main difference was due to the difference of
the I's and E's in the chance condition ($F = 9.296$, $p = .005$).
The results for abnormal shifts are not as impressive, since
there was no I-E, condition, or interaction effect noted
when a similar 2 x 3 analysis of variance was computed. There
was a trend, however, for the I's to increase the abnormal
shifting as the condition became more skill-oriented
($F = 2.438$, $p = .10$). There was also a trend for the I's to
have fewer abnormal shifts than the E's in the chance condi-
tion ($F = 2.919$, $p = .10$).

Since both the I-E scale and the POS purport to
measure somewhat the same personality dimension, experience

TABLE 11

Analysis of Variance for Total Number of Shifts

Source	df	MS	F	p
Between Groups	(5)			
Internal-External (I-E)	1	34.850	3.55	.07
Condition (C)	2	3.37	.34	
I-E x C	2	7.07	.72	.50
Within Groups	102	9.80		
TOTAL	107			

of control, the I-E scale and the various factors of the POS were correlated. Of the 18 factors which make up the POS, 16 were significantly correlated with the I-E scale (Table 12). All 16 correlations were significant at the .01 level.

TABLE 12

Correlation of the 18 POS Factors (F's)
with the I-E Scale for
the 181 Subjects

I-E Scale	
F1 = -.329*	F10 = .376*
F2 = -.288*	F11 = -.335*
F3 = -.024	F12 = -.308*
F4 = -.329*	F13 = .054
F5 = .425*	F14 = .328*
F6 = .485*	F15 = -.215*
F7 = .302*	F16 = -.365*
F8 = -.403*	F17 = .212*
F9 = .494*	F18 = .202*

*Significant at .01 level

DISCUSSION

The research presented here differed from other research concerning the construct of experience of control in several ways. The obvious and most important difference was the chief criterion utilized to judge the subjects' performance. For example, instead of using decision time (Julian and Katz, 1968; Rotter and Mulry, 1965), reaction time (Cromwell et al., 1961), number of shifts (Lefcourt, 1967), or some criterion unknown to the subjects (Davis and Phares, 1967), the main criterion used was the actual number of correct responses a subject made on a task. This had previously been designated as one of the performance tasks. Another difference between this and previous research was the feed-back given the subject. In this research the subjects were not informed of their performance until several weeks after the experiment. Therefore, the subjects had to supply their own level of reinforcement based on their knowledge of the task as was given in the instructional set. A third important difference between this and most other research was the instructional set. With the exception of Lefcourt (1967), no other researcher had attempted to induce a moderate control situation. These differences, especially the first and last, may have contributed to the

lack of significances obtained concerning the hypotheses.
Most of the results which were obtained, however, can be
explained from a close examination of the previous research.

The significant condition or situation effect, and
the lack of a significant I-E or interaction effect on the
main performance variables, are consistent with the results
of Feather (1967) and McDonald, Tempone and Simmons (1968).
One possible explanation for these results is that the ex-
perience of control or generalized expectancy variable has
little effect on the behaviors selected as the performance
measures. Concordant with this explanation is the corollary
that behavior is almost entirely situationally determined.
Support for this hypothesis is found in the study of Lefcourt
and Ladwig (1965). They discovered that E's, when placed in
a situation in which they had had prior success, reacted in
a manner most characteristic of I's. Also in line with this
hypothesis, Mischel (1968) has concluded that most per-
sonality traits do not exert as much influence on behavior
as does the situation in which the behavior occurs. Al-
though the hypothesis that the situation is more powerful
than the personality variable is probably the best explana-
tion for the obtained results, one could speculate upon
alternative hypotheses to account for the lack of sig-
nificant results concerning the personality variable.

As noted earlier, the hypotheses indicated that
there would be a significant I-E by condition interaction

effect. This hypothesized effect was predicated on the belief that a change in behavior across conditions would occur for both I's and E's, such as that which Rotter and Mulry (1965) had found. The results heretofore presented, however, indicated that the I's did not change significantly across conditions. This is consistent with the research of Julian and Katz (1968) and Lefcourt (1967). They had found that I's maintained the same response strategy regardless of the definition of the situation. The E's, on the other hand, varied with the instructional set. This was true when the total number of discriminations or only the difficult discriminations were considered. The results of Julian and Katz (1968) suggested that a difference in performance might occur if the difficult, as opposed to the easy, discriminations were considered. They had found that in the skill condition, the I's spent significantly longer on the difficult items than on the easy items; this was not true of the E's. This suggests that in the skill condition, the I's might obtain more correct discriminations of difficult angles than the E's. This was borne out in the present research, as the I's did discriminate significantly more correct matches than did the E's in the high-skill condition. In fact, if one considers the chance and high-skill conditions, which is the usual design, the predicted interaction between I-E and condition is significant at the .09 level when these difficult discriminations are the performance

criteria. However, most of the significant results in the angle-matching portion of the study were due to the significant condition effect and most of this condition effect was accounted for by the variation in the scores of the E's across conditions.

The results of the estimates of future performance somewhat paralleled the results of the angle-matching task in that there was a significant condition effect but no interaction or I-E effect. However, an inspection of Figures 1 and 3 reveals that while the moderate-skill condition was the highest in the angle-matching task, the high-skill condition contained the highest average estimates. As noted earlier, there was a significant I-E effect in the chance condition, with the I's having the highest estimates. The second hypothesis had predicted that the E's estimations of future performance would be higher than that of the I's. However, this hypothesis was based on the researcher's assumption that the E's would score higher in the chance condition and would also think they would do better. This hypothesis was not consistent with the major tenet in the introduction, that the I's would behave more maladaptively (act in a manner inappropriate to the instructional set) when placed in a chance condition. Had the researcher followed this line of thought and the research reviewed to a logical conclusion, the obtained result could have been

predicted; that is, if a situation is chance-determined, one's estimate of future performance should not be beyond the 50-50 or chance prediction. This should especially be true in the instance where one was penalized for a loss, as the subjects were informed they would be. As Figure 3 indicates, the E's average estimate of future performance was about 50-50 but the I's predictions were significantly beyond that level. Therefore, if the task had indeed been chance and the score (which was a measure combining accuracy of response with accuracy of prediction) had been computed, the I's would have scored significantly lower. Thus the results indicate that in the chance condition the I's react more maladaptively. As with the angle-matching task, it is again the E's who change their behavior over conditions while the I's are more consistent and, consequently, do not account for as much of the variance.

The higher estimations in the chance situation and the general lack of any significant change in the behavior of the I's across conditions may be due to several factors.

The lack of a change in the I's across conditions in their estimates of future performance was due mainly to their abnormally high estimations in the chance condition. As noted earlier, these estimates were much higher than they should have been since the only information the subjects had upon which to base these estimates was the fact that most people matched only about 18 per cent of the angles correctly.

Probably the most obvious interpretation is that I's, by
definition, see themselves as controlling the situation.
Therefore, regardless of the instructional set, they react
as though they have control of the situation. Since most
situations which confront the individual are determined more
by skill than by luck, this is the most adaptive way to
respond in most situations. Another explanation for this
might be labeled negativism. Rotter (1966, p. 23) reported
this tendency in I's in discussing three unpublished dis-
sertations by Strickland, Getter, and Gore. Strickland and
Getter had both found I's more negativistic when attempts
were made to condition them. Gore had found that when
subtle suggestions were made to the subjects to tell long
Thematic Aperception Test (TAT) stories, I's produced
stories that were significantly shorter than those of the
E's. Thus, the higher estimates given by the I's in the
chance condition may have been a reaction against the at-
tempts to influence them.

Another hypothesis which Julian and Katz (1968) and
Rotter (1966) suggested to account for the seemingly con-
sistent strategy of the I's is that the I-E scale may be
measuring a need for control and not an expectancy of con-
trol. Such a motivational aspect to the variable could
account for the I's developing a more self-determined
strategy regardless of the situation. Related to this
hypothesis is the finding of Lefcourt, Lewis, and Silverman

(1968) who found that there was a greater tendency for all
subjects to accept skill instructions and to reject chance
instructions. However, there was a more distinct tendency
for the I's than the E's to reject the chance condition.

Therefore, if either the negativism or the tendency
to reject the instructional set occurred during the present
experiment, it would help account for the results. The
latter alternative, however, would seem to fit the present
data better; that is, the negativism would account only for
the results of the estimates of future performance, while
the other alternative could help to explain the angle-
matching results, the differing estimates of future per-
formance, the accuracy score results, and the amount of
shifting of the estimates of future performance.

If there is a difference in the tendency to reject
or accept an instructional set, then there should be some
difference in the performance of the I's across conditions
due to those subjects who accept the instructional set.
However, the difference should not be significant since
the other subjects have rejected the set. The tendency of
more E's to accept the set should make their differences
across conditions greater. In light of this, it is not
surprising that the I's made a higher predicted estimate
than the E's and made almost as many correct discriminations
as the E's. Also, since the E's accept the instructions and

since they do not believe they can do as well as the I's
believe they can when the condition is defined as skill, it
is not surprising that their estimates and actual per-
formance are lower though not significantly lower than that
of the I's, when the situation is strictly defined as skill.
When a combination of the two factors of estimation and dis-
crimination are considered, as one would expect, the absolute
difference for I's and E's is even greater in the high-skill
condition. The results of the shifting patterns of the I's
and E's, however, are more readily explained by the hypoth-
esis of negativism. The lack of shifting would be expected
if the condition were skill-determined and if each angle were
preceded by an angle of equal difficulty. However, since
hard and easy angles were alternated and since the condition
was labeled as chance, one should predict a high amount of
shifts such as those displayed by the E subjects.

Due to the recent development of the POS, the use
of the scale in this research was essentially exploratory
in nature. It was hypothesized that some of these factors
might be more highly correlated with the present performance
measures than the I-E scale. Factors 1 and 3 were selected
as the factors which would be more highly related to the
performance in the three situations. These factors were
chosen because their definition and item-content appeared
to contain a high-skill versus chance orientation. The

choice was also prompted by the fact that these factors were more closely tied to specific situations and were not as global in nature. However, as reported in the results, of the six most reliable factors, the factor which had the highest correlations with the performance measures was factor 6. This factor is also one of the six most reliable factors most highly correlated with the I-E variable. Consequently, it was added to the final analyses.

It had been predicted in the fourth hypothesis that factors of the POS would be more highly related to the subjects' behavior on the performance measures than would the I-E scale. The direction of this relationship had been stated. In the angle-matching or discrimination task this hypothesis was not borne out and the only significant result obtained on any of the three factors (F1, F3, and F6) was the personality variable effect found with F6. The I's had made more correct discriminations. When the estimates of future performance were a criterion, however, the results were more complex and more difficult to analyze. As reported earlier, when I-E was the personality variable, the only significant result in the 2 x 3 analysis of variance for estimates of future performance was the situation or condition effect. This was also the finding when F3 was the personality variable. However, when F1 was utilized as the personality variable, there was a significant interaction as well as a significant condition effect. When F6 was the personality

variable, there was a significant personality and situation effect. Therefore, although the fourth hypothesis was not confirmed, the significant results obtained with F1 and F6 suggest that the POS shows promise as a personality inventory from which one may predict future performance. However, these results are merely suggestive, and extensive research with this scale needs to be undertaken before its usefulness in predicting behavior can be fully assessed.

Another question which was investigated in this study was the extent of the relationship between the various factors of the POS and I-E scale. If the two scales are tapping the same variable, then one would expect a significant correlation between the I-E scale and the various POS factors. Although 16 of the 18 factors of the POS correlated significantly with the I-E scores, the correlations were not of great magnitude. The lack of high correlations between the two scales is most likely a reflection of the type of items selected for each scale. The items of the I-E scale are restricted in content to what Coan (1969) labeled "external events." The POS factors, on the other hand, contain a diversity of events in their content. The large number of significant correlations, however, suggests that the two scales may be measuring some aspects of the same general variable of experience of control. It is also possible, however, that the I-E scale is measuring a wide variety of

external events corresponding to those which are measured by
the POS factors. This could also account for the significant
correlations which were obtained.

SUMMARY

The purpose of the present research was to determine
the effect that the personality variable of experience of
control would have on behavior when subjects were placed in
conditions of varying degree of situational control. Hy-
potheses were generated from previous research concerning
the reactions of subjects when they were placed in situations
in which the perceived control of the subjects was varied.
Special tasks were administered to determine actual per-
formance, and estimates of future performance. Instructional
set was varied to induce the situational set. These situa-
tional or conditional sets were constructed to make the sub-
jects believe that the results of their efforts would be due
either to chance, partially due to skill, or completely due
to skill. The personality variable was measured by the I-E
Locus of Control Scale and by the recently developed Per-
sonal Opinion Survey.

The sample analyzed in the I-E portion of the study
consisted of 108 subjects. There were 18 internal and 18
external subjects, drawn from the lower and upper one third
of the I-E scale in each of the three situational conditions.
The sample for the POS analyses was composed of the subject
pool of 181 subjects, all of whom had completed all of the

required tasks. Again, 18 of the upper one third and 18 of the lower one third were drawn from each condition for factors 1, 3, and 6. The subjects were all introductory psychology students at The University of Arizona. The analysis of variance technique was utilized to determine the personality-situational effects in the I-E and F1, F3, and F6 portion of the study, and a correlational analysis was used with the other POS results.

It was found that the situational variable is much more powerful than the personality variable in effecting behavior on the two main variables, number of correct discriminations, and estimates of future performance.

However, it was also discovered that one possible interpretation for the lack of a significant personality or personality-by-condition interaction was the constancy of the response of the internals regardless of the situation. The externals, on the other hand, changed significantly across conditions. Possible explanations for this difference, such as the negative reaction of internals when subjected to subtle suggestions and the tendency for internals to reject a chance interpretation, were discussed. Of these two alternatives, the latter seemed more consistent with the present data. This also suggests that any future research utilizing instructional set as the condition variable should include an awareness questionnaire

in order to determine to what extent the subjects actually perceive the condition as due to skill or chance.

When the large analyses of the data were broken down into simpler components, some differences between the internals and externals were observed; that is, internals' estimates of future performance were higher than externals', and internals made more correct difficult discriminations in the high-skill condition. There was also a near-significant I-E by condition interaction of the total number of correct discriminations when only the chance and high-skill conditions were compared.

The results of the POS indicated that of the first six and most reliable factors, F6 was the most highly correlated with the main performance variables and also had the most significant analysis of variance results. The results indicated that the POS showed promise as a predictor of behavior and further research was suggested. The correlation of the I-E scale and POS suggests that both scales are tapping a common variable as 16 of the 18 POS factors were significantly correlated with the I-E score.

Consequently, over all, the results suggest that the situational variable is a more powerful determinant of behavior than is the personality variable under investigation. The results also indicate that the conditional or situational variable has more effect on the external subjects than on the

internal subjects. A comparison of two measures of experience of control also suggests that there is some common dimension which both scales are tapping.

APPENDIX A

MEANS AND STANDARD DEVIATIONS OF I'S AND E'S

Group		Score	SD
I's	Chance	4.61	1.98
I's	Moderate-Skill	4.66	1.85
I's	High-Skill	4.66	1.52
E's	Chance	14.22	1.35
E's	Moderate-Skill	13.55	3.71
E's	High-Skill	12.85	3.61

APPENDIX B

THE 18 PERSONAL OPINION SURVEY FACTORS

AND THEIR DEFINITIONS

Factor 1
    Most of the items loaded highly by this factor are
stated in the third person. They generally express the view
that one can accomplish many things if one tries hard enough.
Success may lie in the academic, social, or physical realm.
We may call this achievement through conscientious effort.

Factor 2
    Here the high scorer expresses the confidence that he as
an individual has the capacity for accomplishment in various
realms--mathematical, mechanical, scientific, athletic,
linguistic. The areas of success manifested in the highly
loaded items tend to be intellectual in character and tend
to be deemed more appropriate for men than for women in our
society. A suitable title might be personal confidence in
ability to achieve mastery.

Factor 3
    This may be called capacity of mankind to control its
destiny vs. supernatural power or fate. The items refer to
man's ability to build a just society, to control both his
own evolution and natural physical phenomena, and the pos-
sibility of acting to eliminate war.

Factor 4
    All highly loaded items are stated in the first person
and refer essentially to the planning, organization, and
completion of tasks. The factor thus involves successful
self-control in the realm of work. We may call it suc-
cessful planning and organization.

Factor 5
    Here again the items are personal. The ones positively
loaded report a lack of control of somatic, affective, and
cognitive processes. The subject is afflicted with un-
avoidable itching, depression, ideas that run through his
mind, muscle incoordination, twitching or tightening up of
muscles, unexplainable cheerfulness, etc. A fitting title

59

would be <u>lack of self-control over internal processes vs.</u>
<u>self-control</u>.

Factor 6
This evidently (is) <u>lack of control over large-scale</u>
<u>social and political events</u>. Both the subject himself and
people in general are seen by the high scorer as helpless
with respect to major societal processes.

Factor 7
The high scorer expresses the view that most people can-
not be relied upon either to meet his own needs or those of
others. The low scorer views people as more benevolent and
is possibly more intropunitive himself. A reasonable title
would be <u>people viewed as undependable vs. dependable</u>.

Factor 8
If we go by the few highly loaded items, this is <u>academic</u>
<u>grading viewed as just vs. capricious</u>. It is not clear to
what extent this factor governs one's outlook on other kinds
of rewards and punishments.

Factor 9
If we judge this by the two items most highly loaded, it
could be called <u>dependence of success on luck</u>. The items of
more meager loading combine a certain confidence in the pos-
sibility of self-control with uncertainty regarding environ-
mental feed-back. With respect to the areas of control
covered by the items, there seems to be nothing very dis-
tinctive about this factor.

Factor 10
Here again there is a fair range of events embraced by
item content, but a fairly persistent theme is self-control
in the attitudinal or motivational realm. An appropriate
title might be <u>impossibility of willed actions and decisions</u>
<u>vs. possibility of successful assertion of the will</u>.

Factor 11
The four most highly loaded items are all first-person
items and are concerned with whether the subject is able to
secure desired reactions from other people. We may call
this <u>control in immediate social interaction</u>.

Factor 12
This seems to be <u>dependence on others for direction vs.</u>
<u>self-sufficiency</u>. The subject's responses indicate es-
sentially that he either tends to seek help or prefers to
rely on his own judgment. The high scoring subject apparently
tends also to attach value in general to listening to the
views of others on important matters.

Factor 13

Here the high scoring describes himself as victimized by others but capable of good control over his own actions. At the negative pole are items referring to unbreakable habits. The content at the positive pole suggests in combination a sort of paranoid self-sufficiency. A good tentative title would be <u>defensive self-reliance</u>.

Factor 14

The high scorer is easily embarrassed, blushes easily, and has feelings that are easily hurt. The remaining item content, though meager, supports an interpretation of this as <u>emotional vulnerability</u>.

Factor 15

This is a <u>personal responsibility</u> factor. The few pertinent items indicate that the high scorer both considers himself responsible for most of his misfortunes and feels that other people should be assigned responsibility for their actions.

Factor 16

Like factors 5 and 10, this is a self-control factor. It differs from 10 in not being concerned with willed action in general. It differs from 5 in being concerned more with work and action than with internal processes. Perhaps an accurate title would be <u>personal control over thought and action</u>.

Factor 17

This factor seems to be concerned with somatic manifestations of anxiety and with ability to withstand high places, pain, and social stress. Perhaps a reasonably accurate title would be <u>nervous tension</u>.

Factor 18

With respect to intentional behavior, this factor is characterized by lack of control at the positive pole. Thus, the high scorer has bad habits that are too strong to fight, has difficulty starting things, and is occasionally afflicted with uncontrollable laughing or crying. He is free from gastrointestinal disorders, however, while the low scorer suffers from them. We may tentatively identify this as <u>carefree acknowledgment of shortcomings</u>.

APPENDIX C

INSTRUCTIONS FOR ANGLE-MATCHING AND ESTIMATION TASKS

On each page of the booklet there is a large angle on the left-hand side of the page and seven smaller angles on the right. Cross out the angle on the right which is most like the angle on the left.

After you have made your selection, state what you feel the probability of your being right on the next trial will be. Place a number, from 0 to 10, in the box labeled "est."

est.

REFERENCES

Coan, R. W. Part IV: The relationship between smoking and over-all personality organization. A Report to the National Clearing House for Smoking and Health, 1968.

Coan, R. W. The experience of control. Unpublished manuscript, Department of Psychology, University of Arizona, 1969.

Cromwell, R. L., Rosenthal, D., Shakow, D., and Zahn, T. P. Reaction time, locus of control, choice behavior, and descriptions of parental behavior in schizophrenic and normal subjects. Journal of Personality, 1961, 29, 363-379.

Davis, W. L. and Phares, E. J. Internal-external control as a determinant of information seeking in a social situation. Journal of Personality, 1967, 35, 547-561.

Feather, N. T. Valance of outcome and expectation of success in relation to task difficulty and perceived locus of control. Journal of Personality and Social Psychology, 1967, 7, 372-386.

Gore, P. M. and Rotter, J. B. A personality correlate of social action. Journal of Personality, 1963, 31, 58-64.

Hersch, P. D. and Scheibe, K. E. Reliability and validity of internal-external control as a personality dimension. Journal of Consulting Psychology, 1967, 31, 609-613.

Holden, K. B. and Rotter, J. B. A nonverbal measure of extinction of skill and chance situations. Journal of Experimental Psychology, 1962, 63, 519-520.

James, W. H. and Rotter, J. B. Partial and 100% reinforcement under skill and chance conditions. Journal of Experimental Psychology, 1958, 55, 397-403.

Julian, J. W. and Katz, S. B. Internal versus external control and the value of reinforcement. Journal of Personality and Social Psychology, 1968, 8, 89-94.

Lefcourt, H. M. Risk-taking in Negro and white adults. Journal of Personality and Social Psychology, 1965, 2, 765-770.

Lefcourt, H. M. Internal versus external control of reinforcement: A review. Psychological Bulletin, 1966, 65, 206-220.

Lefcourt, H. M. Effects of cue explication upon persons maintaining external control expectancies. Journal of Personality and Social Psychology, 1967, 5, 372-378.

Lefcourt, H. M. and Ladwig, G. W. The effects of reference group upon Negroes' task persistence in a biracial competitive game. Journal of Personality and Social Psychology, 1965, 1, 668-671.

Lefcourt, H. M., Lewis, L., and Silverman, I. W. Internal versus external control of reinforcement and attention in decision making. Journal of Personality, 1968, 36, 663-682.

Lipp, L., Kolstoe, R., James, W., and Randall, H. Denial of disability and internal control of reinforcement. Journal of Consulting and Clinical Psychology, 1968, 32, 72-75.

Liverant, S. and Scodel, A. Internal and external control as determinants of decision making under conditions of risk. Psychological Reports, 1960, 7, 59-67.

McDonald, R., Tempone, V. J., and Simmons, W. L. Locus of control as a situational and personality variable. Unpublished manuscript, 1968.

Mischel, W. Personality and Assessment. New York: John Wiley and Sons, Inc., 1968.

Phares, E. J. Expectancy changes in skill and chance situations. Journal of Abnormal and Social Psychology, 1957, 54, 339-342.

Phares, E. J. Perceptual threshold decrements as a function of skill and chance expectancies. Journal of Psychology, 1962, 53, 399-407.

Rotter, J. B. Social Learning Theory and Clinical Psychology. Englewood Cliffs, New Jersey: Prentice Hall, 1954.

Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 80, 1-28.

Rotter, J. B., Liverant, S., and Crown, D. P. The growth and extinction of expectancies in chance controlled and skilled tests. Journal of Psychology, 1961, 52, 161-177.

Rotter, J. B. and Mulry, R. C. Internal versus external control of reinforcement and decision time. Journal of Personality and Social Psychology, 1965, 2, 598-604.

Rotter J. B., Seeman, M. R., and Liverant, S. Internal versus external control of reinforcement: A major variable in behavior theory. In Washburn, N. F. (ed.), Decisions, Values, and Groups, Vol. 2, London: Pergamon Press, 1962, 473-507.

Schneider, J. M. Skill versus chance activity preference and locus of control. Journal of Consulting and Clinical Psychology, 1968, 32, 333-337.

Seeman, M. Alienation and social learning in a reformatory. American Journal of Sociology, 1963, 69, 270-284.

Seeman, M. and Evans, J. Alienation and learning in a hospital setting. American Sociological Review, 1962, 27, 772-782.

Strickland, B. The prediction of social action from a dimension of internal-external control. Journal of Social Psychology, 1965, 66, 53-358.