

Psychological Monographs: General and Applied

GENERALIZED EXPECTANCIES FOR INTERNAL VERSUS EXTERNAL CONTROL OF REINFORCEMENT

JULIAN B. ROTTER

University of Connecticut¹

The effects of reward or reinforcement on preceding behavior depend in part on whether the person perceives the reward as contingent on his own behavior or independent of it. Acquisition and performance differ in situations perceived as determined by skill versus chance. Persons may also differ in generalized expectancies for internal versus external control of reinforcement. This report summarizes several experiments which define group differences in behavior when Ss perceive reinforcement as contingent on their behavior versus chance or experimenter control. The report also describes the development of tests of individual differences in a generalized belief in internal-external control and provides reliability, discriminant validity and normative data for 1 test, along with a description of the results of several studies of construct validity.

THE role of reinforcement, reward, or gratification is universally recognized by students of human nature as a crucial one in the acquisition and performance of skills and knowledge. However, an event regarded by some persons as a reward or reinforcement may be differently perceived and reacted to by others. One of the determinants of this reaction is the degree to which the individual perceives that the reward follows from, or is contingent upon, his own behavior or attributes versus the degree to which he feels the reward is controlled by forces outside of himself and may occur independently of his own actions. The effect of a reinforcement following some behavior on the part of a human subject, in other words, is not a simple stamping-in process but depends upon whether or not the person perceives a causal relationship between his own behavior and the reward. A perception of causal relationship need not be all or none

but can vary in degree. When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action, then, in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted in this way by an individual, we have labeled this a belief in *external control*. If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in *internal control*.

It is hypothesized that this variable is of major significance in understanding the nature of learning processes in different kinds of learning situations and also that consistent individual differences exist among individuals in the degree to which they are likely to attribute personal control to reward in the same situation. This report is concerned with reviewing a number of studies which have been made to test both hypotheses; to present some heretofore unpublished experimental results; and to present in detail new data regarding the development, reliability, and validity of one measure of individual differences in a generalized belief for inter-

¹ Most of the work reported by the author was completed at the Ohio State University. The program of research was supported by a 4-year grant from the United States Air Force under Contract No. AF 49(638-741), monitored by the Air Force Office of Scientific Research, Office of Aerospace Research. Secretarial assistance for writing this report was provided by the University of Connecticut Research Foundation.

nal versus external control of reinforcement.

Theoretical Background

Social learning theory (Rotter; 1954, 1955, 1960) provides the general theoretical background for this conception of the nature and effects of reinforcement. In social learning theory, a reinforcement acts to strengthen an *expectancy* that a particular behavior or event will be followed by that reinforcement in the future. Once an expectancy for such a behavior-reinforcement sequence is built up the failure of the reinforcement to occur will reduce or extinguish the expectancy. As an infant develops and acquires more experience he differentiates events which are causally related to preceding events and those which are not. It follows as a general hypothesis that when the reinforcement is seen as not contingent upon the subject's own behavior that its occurrence will not increase an expectancy as much as when it is seen as contingent. Conversely, its nonoccurrence will not reduce an expectancy so much as when it is seen as contingent. It seems likely that, depending upon the individual's history of reinforcement, individuals would differ in the degree to which they attributed reinforcements to their own actions.

Expectancies generalize from a specific situation to a series of situations which are perceived as related or similar. Consequently, a generalized expectancy for a class of related events has functional properties and makes up one of the important classes of variables in personality description. Harlow's (1949) concept of high-level learning skills seems similar to this notion that individuals differ in learned generalized expectancies involving relationships between a wide variety of behaviors and their possible outcomes. A generalized attitude, belief, or expectancy regarding the nature of the causal relationship between one's own behavior and its consequences might affect a variety of behavioral choices in a broad band of life situations. Such generalized expectancies in combination with specific expectancies

act to determine choice behavior along with the value of potential reinforcements. These generalized expectancies will result in characteristic differences in behavior in a situation culturally categorized as chance determined versus skill determined, and they may act to produce individual differences within a specific condition.

Specific expectancies regarding the causal nature of behavior-outcome sequences in different situations would also affect behavior choice. 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.

Related Conceptions

In learning theory it has been recognized that differences in subject behavior are related to task differences along a dimension of skill and chance. Goodnow and Postman (1955) and Goodnow and Pettigrew (1955), for example, present data to show that probabilistic learning theory is not applicable where the subject feels that the occurrence of the reinforcement is lawful. Wyckoff and Sidowsky (1955) similarly felt that their subjects' behavior changed when they no longer felt that the task was a "guessing" problem. Cohen (1960) has extensively studied differences in subjects' behavior or strategy in choice and skill games noting the tendency for the "gambler's fallacy" to appear in chance games... an effect opposite to the usual effect of reinforcement. A somewhat different approach to chance and skill task differences is assumed by Feather (1959) who felt that motivation was lessened in chance tasks as compared to skill tasks. In general, however, a *theoretically based, systematic study* of chance and skill differences in acquisition and performance has not been made prior to the series of studies to be reported here.

The literature of personality theory does contain discussions of a number of variables which may have some relationship to the one of major concern in this paper.

The significance of the belief in fate, chance, or luck has been discussed by various social scientists over a long period of time. Most of their concern, however, has been with differences among groups or societies rather than individuals. Typical of an early discussion of this kind is that of Veblen (1899), who felt that a belief in luck or chance represented a barbarian approach to life and was generally characteristic of an inefficient society. Although Veblen was not concerned with individual differences, his discussion implied that a belief in chance or luck as a solution to one's problems was characterized by less productivity and, consequently, bears some parallel to the hypothesis that a belief in external control of reinforcements is related to a general passivity. Veblen also stated, "In its simple form the belief in luck is this instinctive sense of an unscrutable, teleological propensity in objects or situations." In other words, Veblen states that the belief in luck is related to or similar to a general belief in fate.

More recently, Merton (1946) has discussed the belief in luck more or less as a defense behavior, as an attempt "to serve the psychological function of enabling people to preserve their self esteem in the face of failure." He states it "may also in some individuals act to curtail sustained endeavor," or, in other words, he too suggests a relationship between passivity and the belief in chance or luck.

The concept of alienation which has played an important role in sociological theory for many years does seem related at a group level to the variable of internal-external control. The alienated individual feels unable to control his own destiny. He is a small cog in a big machine and at the mercy of forces too strong or too vague to control. Marx, Weber, and Durkheim placed great importance on this concept, and more recently Merton (1949) has stressed its importance in the study of asocial behavior. Seeman (1959) has linked the concept of alienation as it refers to *powerlessness*, to internal-external control as a psychological variable. Some

sociologists (Nettler, 1957; Srole, 1956) have developed a crude individual measure of alienation.

In psychology, White (1959) in discussing an alternative to drive reduction has noted how the work of many authors has converged on a belief that it is characteristic of all species to explore and to attempt to master the environment. He has labeled this concept *competence*. While White was not specifically interested in individual differences he has noted that such a motive or drive is not explained by primary drive and although perhaps not as strong as some primary drives it is moderate in strength and persistence. Angyal (1941) has also noted the significance of the organism's motivation towards *autonomy*, or the active mastery of the environment.

There are a number of other psychological variables which appear to bear some relationship to the concept under investigation. Some of these are undoubtedly related, but, for others, it is possible that the relationship is more apparent than real.

Perhaps one of the major conceptions which bears some relationship to the belief in internal versus external control of reinforcements is that of need for achievement. The work of McClelland, Atkinson, Clark, and Lowell (1953) and of Atkinson (1958) and their colleagues working primarily with adults, and Crandall (1963) with children, suggests that people who are high on the need for achievement, in all probability, have some belief in their own ability or skill to determine the outcome of their efforts. The relationship is probably not linear, however, since a person high on motivation for achievement might not be equally high on a belief in internal control of reinforcement, and there may be many with a low need for achievement who still believe that their own behavior determines the kinds of reinforcements they obtain.

Another variable which may bear some genuine relationship to the variable of internal versus external control of reinforcement is the concept of "field determined"

versus "body oriented." The work of Witkin, Lewis, Hertzman, Machover, Meissner, and Wapner (1954) suggests that people can be ordered on a continuum, in some perception experiments, describing whether they derive most of their cues from the field or from internal sources. A study by Linton (1955) suggests that people who are "field oriented" or "field dependent" tend to be more conforming. However, unpublished data of the author indicate no relationship between an individual measure of internal-external control and the Gottschalk Figures Test, a measure frequently used as an operation for "field determined."

Perhaps less clear is the relationship of internal versus external control of reinforcement to the notion of "ego control." Although the concept of ego control is not always defined similarly, it seems to contain the ideas of confidence and ability to deal with reality. While it seems likely that the individuals at both extremes of the internal versus external control of reinforcement dimension are essentially unrealistic, it is not as likely that the people toward the middle of the distribution are less confident. We do have indications, however, that the people at either extreme of the reinforcement dimension are likely to be maladjusted by most definitions, and, to the extent that ego control is another type of definition of maladjustment, it would bear some curvilinear relationship to the variable we are concerned with here.

Similar to the conception of Witkin et al. is that of Riesman (1954), who has attempted to describe an apparently comparable distinction. Riesman's conception is based on the degree to which people are controlled by internal goals, desires, etc. versus the degree to which they are controlled by external forces, in particular social forces or conformity forces. Although this variable may bear some relationship to the one under investigation, it should be made clear that the apparent relationship is not as logical as it appears. Riesman has been concerned with whether the individual is controlled from within or from without. We are concerned, how-

ever, not with this variable at all but only with the question of whether or not an individual believes that his own behavior, skills, or internal dispositions determine what reinforcements he receives. While the conformist (the opportunist, in particular) who is actively trying to learn and adjust to the rules of the society he lives in is at one end of Riesman's continuum, he is likely to be in the middle of the continuum with which we are concerned.

Finally, a word should be said about the general concept of causality. This psychological dimension is one which has been neglected for some time, although it is one of the strong interests of Piaget (1930), who studied how the notion of causality developed in children. Pepitone (1958) has recently discussed several aspects of the attribution of causality in social interactions. However, individual differences in how causality is assumed to relate events has not been a subject of investigation. It would seem that some relationship would exist between how the individual views the world from the point of view of internal versus external control of reinforcement and his other modes of perception of causal relationships.

STUDIES OF COMPLEX LEARNING

The notion that individuals build up generalized expectancies for internal-external control appears to have clear implications for problems of acquisition and performance. If a human can deal with future events with the use of verbal symbols and can perceive an event as following a preceding behavior of his own, then the strength of that connection will depend at least in part on whether or not he feels there is a causal or invariable relationship between his behavior and the event. Once a person has established a concept of randomness or chance the effects of reinforcement will vary depending upon what relationship he assigns to the behavior-reinforcement sequence.

A person who is looking for an unusual brand of tobacco and is finally able to find it will return to the same place where he was reinforced before when he needs to-

bacco again. However, an individual who needs money and finds a five dollar bill in the street is not likely to return to that spot to look for a five dollar bill when he needs money. A behavior of looking on the ground may be strengthened to some degree in the latter case. However, the individual is selective in what aspects of his behavior are repeated or strengthened and what aspects are not, depending upon his own perception of the nature or causality of the relationship between the reinforcement and the preceding behavior.

In its simplest form, our basic hypothesis is that if a person perceives a reinforcement as contingent upon his own behavior, then the occurrence of either a positive or negative reinforcement will strengthen or weaken potential for that behavior to recur in the same or similar situation. If he sees the reinforcement as being outside his own control or not contingent, that is depending upon chance, fate, powerful others, or unpredictable, then the preceding behavior is less likely to be strengthened or weakened. Not only will there be a difference of degree but also a difference, in some instances, in the nature of the function as the result of a series of trials. It is evident that if this analysis is correct then different kinds of learning paradigms or situations are going to produce different kinds of learning functions. A learning situation such as that in which the experimenter arbitrarily determines the right response for whether or not food is given, regardless of the behavior of the subject, will produce a different kind of learning than one where the subject believes his behavior determines whether or not the reinforcement will occur. In other words, learning under *skill* conditions is different from learning under *chance* conditions.

To test this hypothesis a series of studies was undertaken comparing verbal expectancies for future reinforcement under conditions of chance and skill learning. In this group of studies it has been necessary in order to compare skill and chance learning tasks directly to provide a similar sequence of reinforcement in both cases which was controlled by the experi-

menter without the subject's knowledge of such control. Two strategies are used. The first is to provide a relatively ambiguous task under two conditions, one in which the subject is *instructed* that it is skill determined. Obviously in these studies we are dealing with a continuum in which in one situation the task is likely to be perceived as relatively more skill determined. The second strategy is to present different tasks which are also surreptitiously controlled by the experimenter and which are defined as skill and chance essentially through previous cultural experience. For example, although they have certain problems of comparability, dice throwing is generally recognized as a chance task, while solving arithmetic problems and throwing darts are generally recognized as skill tasks.

The first of these studies was undertaken by Phares (1957). Phares used color matching as an ambiguous task and instructed half of the subjects that the task was so difficult as to be a matter of luck and the other half of his subjects that success was a matter of skill and that previous research had shown that some people were very good at the task. The subjects matched samples to finely graded standards. He used a second task of matching lines of slightly varying lengths to standards placed on cards at different angles. For both tasks a fixed order of partial reinforcement (right or wrong) was used and the measure of expectancy was the number of chips a subject would bet on his probability of being correct on the succeeding trial.

Phares found, as hypothesized, that the increments and decrements following success and failure, respectively, were significantly greater under skill instructions than under chance instructions. Reinforcements under skill conditions had a greater effect on raising or lowering expectancies for future reinforcements. He also found that subjects shifted or changed their expectancies more often under skill conditions. (Another measure of the same data described above.) Finally he showed a strong trend toward unusual shifts in

expectancies, that is, up after failure or down after success (the gambler's fallacy) under chance conditions. The significance of this last finding was marginal ($p = .07$, two-tailed test).

This study was followed by one by James and Rotter (1958). In this study the emphasis was on the extinction of verbal expectancies. Under conditions of partial and 100% reinforcement an extra-sensory perception (ESP) type of task was used with experimenter control, and the exact same sequence of 50% partial reinforcement was given to two groups of subjects (two other groups had 100% reinforcement) for 10 training trials. Two groups were told that guessing in the task had been shown by scientists to be entirely a matter of luck, and two groups were told that there was evidence that some people are considerably skilled at the task. While the groups did not differ significantly at the end of the training trials, the chance and skill groups did differ significantly in the number of trials to extinction. Extinction was defined as stating an expectancy of 1 or 0 on a scale of 10 for three consecutive trials.

The interesting thing about the results of this investigation was that the usual findings of superiority of partial over 100% reinforcement in trials to extinction was true only of the group with chance instructions, but under skill conditions the mean number of trials to extinction for 100% reinforcement was longer (22.9) than under 50% reinforcement (19.8). Trials to extinction under partial reinforcement were significantly longer for chance than for skill instructions, and trials to extinction for 100% reinforcement were significantly longer for skill than for chance instructions. The findings were interpreted to indicate that under chance conditions the extinction series was interpreted as a change in the situation, a disappearance of previous lucky hits in the 100% reinforcement condition but not in the 50% reinforcement conditions. For the subjects with skill instructions, the greater the previous reinforcement the longer it took the subject to accept the fact that he was not able to do the task successfully.

A further check on these studies was made by Rotter, Liverant, and Crowne (1961), who studied the growth and extinction of expectancies in chance-controlled and skilled tasks. This study involved using two tasks, one the ESP task referred to above and, the second, a motor task presumably involving steadiness which would typically be perceived as a skill task. Again in both tasks similar sequences of reinforcement were used. In this case instructions were identical, the difference in the cultural perception of the tasks being the experimental variable. This study utilized eight groups, four chance and four skill with 25%, 50%, 75%, and 100% reinforcement over eight training trials followed by an extinction series. This study confirmed the previous findings of both Phares and James and Rotter. During the training trials, subjects (except for 100% reinforcement groups) showed greater increments or decrements following success and failure respectively under skill conditions than under chance conditions. Major differences in extinction were obtained independently of the expectancy levels at the end of the training trial. In this study, extinction curves for the two groups crossed over completely, so that all of the findings of the James and Rotter studies were replicated, but, in addition, 100% reinforcement took significantly longer to extinguish than 50% reinforcement in the skill task. Differences between the groups were smaller at the 25% and 75% reinforcement schedules than at 50% or 100%. The latter findings were interpreted as suggesting that at the 25% and the 75% levels the chance task was being rewarded or reinforced more often or less than could be accounted for by chance alone. The frequency of reinforcement itself may tend to make the task appear more like a skill task. In the case of 100% chance reinforcement, however, the abrupt change from continuous positive reinforcement to continuous negative reinforcement suggests a change in the nature of the situation.

The question could arise as to whether or not differences in extinction patterns would be the same with a behavioral cri-

terion other than verbalized expectancies. To test this, Holden and Rotter (1962) again used the ESP task instructing one group of subjects that it was a skill task and the other group that it was determined entirely by luck. Subjects were given two dollars in nickels and told they could bet a nickel on each trial on whether or not they would succeed until they wished to discontinue and keep the remaining money or until they ran out of nickels. Three groups all given 50% partial reinforcement were used, one with skill instructions, one with chance instructions, and one with ambiguous instructions. Results showed a clear difference, with the subjects given chance instructions and those who were not told it was either a chance or a skill task having significantly more trials to extinction (almost twice as many) than the skill group. Extinction was defined as voluntarily quitting the experiment.

An unpublished dissertation by Bennion (1961) using the same tasks as in the Rotter, Liverant, and Crowne study, rather than instructions to produce the skill and chance difference, examined a partial reinforcement sequence that was predominantly positive but in which reported scores differed in variability to two groups. Overall mean score and frequency of success and failure as defined by the experimenter were controlled. Bennion hypothesized that greater variability of scores either under chance or skill conditions would produce results similar to that of the difference between the chance and skill conditions. There would be greater responsiveness in changes in expectancy to success and failure under the less variable conditions. He found support for this hypothesis as well as replicating the difference in responsiveness under chance and skill conditions obtained by Phares and by Rotter, Liverant, and Crowne in previous studies.

In another unpublished dissertation, James (1957) studied some of the same variables and in addition the generalization of expectancies and the "spontaneous recovery" of expectancies. He used both a line-matching and an angle-matching task. Two groups, one with chance and

one with skill instructions, were given 75% reinforcement for a sequence of eight trials and then were tested for generalizations of expectancies by having one trial on the new second task. Two other groups were given the same 75% reinforced eight training trials followed by a series of extinction trials, then given a 5-minute rest and given two additional trials on the same task. These latter groups were examined for "spontaneous recovery." James' findings again replicated the differences between chance and skill groups in the growth of acquisition of expectancies. He found, as hypothesized, significantly greater generalization of expectancies from one task to another under skill instructions than under chance instructions. He also found more "spontaneous recovery" under skill instructions, but the difference in this case only approached significance.

Bennion's study of the effect of variability in scores on a task can be interpreted as defining one of the conditions which make for the perception that the task is in fact skill or chance determined. Other conditions affecting such a perception were studied by Blackman (1962). Blackman used the well-replicated finding that under chance conditions extinction in a 50% reinforcement sequence is likely to be considerably longer than under skill conditions. In a counterbalanced design he used numerous sequences of presumably random appearing lights, controlling for the percentage of reinforcement. The task was one of attempting to predict whether a red or a green light would appear on the following trial. He varied the length of sequences in which the same light would appear consecutively, and he varied the degree of patterning from presumably purely random through an easy pattern to a complicated pattern. Extinction began when the red light ceased to go on, and the measure of extinction was based upon the elimination of subject predictions of red responses. He found, as he hypothesized, that the length of sequences significantly affected the number of red responses in extinction and the expectancies associated with them. The longest sequences ex-

tinguished more quickly. Similarly, the easy but not the complicated pattern, which was apparently not perceived, also resulted in quicker extinction. These results are interpreted to indicate that longer sequences and recognizable patterns suggest to the subject that there is not a random pattern but an experimenter-controlled one. Consequently, when extinction begins and the red light no longer appears the subject interprets the situation as one in which the experimenter has changed the sequence of lights. If, however, the subject interprets the original sequence as random, he will persist much longer before extinguishing on anticipation that the red light will appear again.

Implications from the studies of Rotter, Liverant, and Crowne (1961), Bennion (1961), and Blackman (1962) can be summarized. Subjects are more likely to see a sequence of reinforcement as *not* being chance controlled when the percentage of reinforcement significantly deviates from a 50-50 percentage in a right-wrong situation, when the sequence of reinforcements appears to have a pattern, when unusually long sequences of one of two alternative events occur, and when variability of performance is minimal in a task allowing for scoring along a continuum.

A somewhat different variable was investigated by Phares (1962), who studied perceptual thresholds for shock-associated stimuli in chance-controlled versus skill situations. Phares used a tachistoscopic exposure of nonsense syllables, some of the stimuli being accompanied by shock. The skill group was told that the shock could be escaped by pressing the correct button which could be learned. The chance group was instructed that they could press any of the sequence of buttons and this may or may not avoid the shock depending upon chance. The skill group was run first and then the chance groups. In this way the experimenter could control the number of shocks, so that he was able to match the chance group with the skill group in the total number of shocks obtained during the 10 training trials. Recognition thresholds for the syllables were

taken before and after the training. He found, as hypothesized, that the recognition thresholds dropped significantly more in the skill-instructed than in the chance-instructed groups although they had had the same number of shocks on the same trials and for the same nonsense syllables. Phares concluded that subjects who feel they have control of the situation are likely to exhibit perceptual behavior that will better enable them to cope with potentially threatening situations than subjects who feel chance or other noncontrollable forces determine whether or not their behavior will be successful.

Investigations of differences in behavior in skill and chance situations provide relatively clear-cut findings. When a subject perceives the task as controlled by the experimenter, chance, or random conditions, past experience is relied upon less. Consequently, it may be said that he learns less, and under such conditions, he may indeed learn the wrong things and develop a pattern of behavior which Skinner has referred to as "superstitious." These studies strongly imply that the interpretation of investigations of acquisition and performance must be made in light of the position on the continuum of complete chance control to complete skill control at which the particular task falls. Differences in learning are not merely a matter of degree but also of nature or kind as indicated by the dramatic reversal of extinction curves as demonstrated by Rotter, Liverant, and Crowne (1961). Perhaps more important are the implications for the learning theory favored by psychologists in general. Such theory is often based upon experimental paradigms which involve experimenter control. That is, they use tasks where the experimenter decides in a more or less arbitrary fashion when he will reinforce or where he will reinforce but not ones where the subject feels that his own performance determines primarily whether or not he will be successful at the task. However, many, if not the majority of learning situations of humans in everyday life situations, are in fact perceived as skill controlled. The direct application of theories of learning based upon experi-

menter controlled tasks to such learning is in grave doubt.

Although there is no direct proof that "experimenter control" is equivalent to "chance control," it would seem logical that the subject perceiving no regularity or predictability to the reinforcement would regard it similarly. This conclusion is supported by the earlier mentioned Blackman (1962) experiment... a typical "experimenter control" paradigm... where he obtained longer extinction times when the training sequence of partially reinforced red and green lights lacked discernible patterns. It is also supported by the fact that tasks with chance instructions produce the same kind of differences between 100% and 50% partial reinforcement in extinction rates as do the typical experimenter control experiments.

INTERNAL VERSUS EXTERNAL CONTROL AS A PERSONALITY VARIABLE

Development of Measures of Internal-External Control

The first attempt to measure individual differences in a generalized expectancy or belief in external control as a psychological variable was begun by Phares (1957) in his study of chance and skill effects on expectancies for reinforcement. Phares developed a Likert-type scale with 13 items stated as external attitudes and 13 as internal attitudes. The scale was developed on a priori grounds, and he found some suggestive evidence with his first crude attempt at measuring individual differences that prediction of behavior within a task situation was possible. In particular, he found that the items stated in an external direction gave low predictions, approaching statistical significance, that individuals with external attitudes would behave in a similar fashion as did all subjects when placed in a chance situation versus a skill situation. That is, they tended to show more unusual shifts, smaller magnitude of increments and decrements, and a lower frequency of shifts of expectancy in any case than did subjects who scored low on these 13 items.

Phares' work was followed by James'

(1957) dissertation, previously referred to. James revised Phares' test still using a Likert format and wrote 26 items plus filler items based on the items which appeared to be most successful in the Phares study. He similarly hypothesized that within each of his groups, regardless of chance or skill instructions, those individuals who scored toward the external end of the continuum would behave in each group in the same way as the difference between the chance group and the skill group for all subjects. James was able to find low but significant correlations between his test and behavior in the task situation. External subjects had smaller increments and decrements following success and failure, generalized less from one task to another, and recovered less following the period of extinction. They also tended to produce more unusual shifts (up after failure and down after success) in expectancy.

The James-Phares scale has been used in some research involving correlates of individual differences in a generalized expectancy for internal-external control. However, the late Shephard Liverant in association with J. B. Rotter and M. Seeman undertook to broaden the test; develop subscales for different areas such as achievement, affection, and general social and political attitudes; and control for social desirability by the construction of a new forced-choice questionnaire. The earliest version of this scale included a hundred forced-choice items, each one comparing an external belief with an internal belief. The scale was item analyzed and factor analyzed and reduced to a 60-item scale by Liverant on the basis of internal consistency criteria.

Item analysis of the 60-item scale indicated that the subscales were not generating separate predictions. Achievement items tended to correlate highly with social desirability, and some subscales correlated with other scales at approximately the same level as their internal consistency. On this basis, items to measure more specific subareas of internal-external control were abandoned.

Data were collected for a large group of subjects to provide item correlations

with the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1964). The overall correlation of the scale with the Social Desirability scale for different samples ranged from .35 to .40 which was deemed to be too high. Reduction and purification of the 60-item scale was undertaken by S. Liverant, J. B. Rotter, and D. Crowne. Validity data from two studies were used along with internal consistency data. Item validity for most of the items was available from a study of Seeman and Evans on tuberculosis patients who had evidenced greater self-effort towards recovery versus those who were more passive. Item validity for the prediction of individual differences in trials to extinction in the previously cited study of Rotter, Liverant, and Crowne (1961) was also available. In this final revision, wording of some items was changed to make the items appropriate for noncollege adults and upper level high school students.

By eliminating those items which either had a high correlation with the Marlowe-Crowne Social Desirability Scale, a proportional split so that one of the two alternatives was endorsed more than 85% of the time, nonsignificant relationship with other items, or a correlation approaching zero with both validation criteria, the scale was reduced to 23 items. The final version of the scale, the one on which most of the subsequent data to be reported are based, is a 29-item, forced-choice test including 6 filler items intended to make somewhat more ambiguous the purpose of the test. This measure will be referred to in the remainder of this article as the I-E scale.

The I-E scale is presented in Table 1. Instructions for administration are presented in Appendix A. Biserial item correlations with total score *with that item removed* are given for 200 males, 200 females, and the combined group. It can be seen that these are moderate but consistent. The letter preceding the external choice in every item is italicized. The score is the total number of *external* choices.

A careful reading of the items will make it clear that the items deal exclusively with the subjects' *belief* about the nature of the world. That is, they are concerned with

the subjects' expectations about how reinforcement is controlled. Consequently, the test is considered to be a measure of a generalized expectancy. Such a generalized expectancy may correlate with the value the subject places on internal control but none of the items is directly addressed to the *preference* for internal or external control.

Test data on the I-E scale have been obtained in a series of samples. Results are summarized in Table 2. Where no source is given, the data have been collected by the author and are being reported here for the first time.

Internal consistency estimates are relatively stable as shown in Table 2. While these estimates are only moderately high for a scale of this length, it should be remembered that the items are not arranged in a difficulty hierarchy, but rather are samples of attitudes in a wide variety of different situations. The test is an additive one and items are not comparable. Consequently, split-half or matched-half reliability tends to underestimate the internal consistency. Kuder-Richardson reliabilities are also somewhat limited since this is a forced-choice scale in which an attempt is made to balance alternatives so that probabilities of endorsement of either alternative do not include the more extreme splits.

Test-retest reliability for a 1-month period seems quite consistent in two quite different samples. The somewhat lower reliabilities for a 2-month period may be partly a function of the fact that the first test was given under group conditions and the second test was individually administered. In the studies of test-retest reliability, means for the second administration typically dropped about 1 point in the direction of less externality.

Correlations of the 60-item I-E scale with the Marlowe-Crowne Social Desirability Scale were obtained in a number of college student samples and typically ranged between $-.35$ and $-.40$. The attempt to reduce this correlation in the new scale was moderately successful. The correlations for the new scale range from $-.07$ to $-.35$. The greater range may re-

TABLE 1
THE I-E SCALE WITH CORRELATIONS OF EACH ITEM WITH TOTAL SCORE, EXCLUDING
THAT ITEM

Item	Biserial item correlations		
	200 M	200 F	400 M + F
1.a. Children get into trouble because their parents punish them too much.		(Filler)	
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.	.265	.250	.260
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.	.214	.147	.182
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.	.238	.344	.289
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.	.230	.131	.179
6.a. Without the right breaks one cannot be an effective leader.	.345	.209	.319
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.	.200	.262	.229
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.		(Filler)	
b. It is one's experiences in life which determine what they're like.			
9.a. I have often found that what is going to happen will happen.	.152	.172	.164
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 really useless.	.227	.252	.238
11.a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.			
b. Getting a good job depends mainly on being in the right place at the right time.	.391	.215	.301
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.	.313	.222	.265
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.	.252	.285	.271
14.a. There are certain people who are just no good.		(Filler)	
b. There is some good in everybody.			

TABLE 1--Continued

Item	Biserial item correlations		
	200 M	200 F	400 M + F
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.	.369	.209	.288
16.a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.	.295	.318	.307
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.	.313	.407	.357
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.	.258	.362	.310
b. There really is no such thing as "luck."		(Filler)	
19.a. One should always be willing to admit 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.	.255	.307	.271
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.	.108	.197	.152
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.	.226	.224	.227
23.a. Sometimes I can't understand how teachers arrive at the grades they give.	.275	.248	.255
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.		(Filler)	
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.	.521	.440	.480
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.	.179	.227	.195
27.a. There is too much emphasis on athletics in high school.		(Filler)	
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.	.331	.149	.238
29.a. Most of the time I can't understand why politicians behave the way they do.	.004	.211	.109
b. In the long run the people are responsible for bad government on a national as well as on a local level.			

Note.—Score is number of underlined items.

TABLE 2
INTERNAL-EXTERNAL CONTROL TEST DATA: RELIABILITY AND DISCRIMINANT VALIDITY

Sample	Type	N	Sex	r	Source
Internal consistency					
Ohio State University Elementary psychology students Sample 1	Split half	50	M	.65	
	Spearman-Brown	50	F	.79	
		100	Combined	.73	
	Kuder-Richardson	50	M	.70	
		50	F	.76	
		100	Combined	.73	
Ohio State University Elementary psychology students	Kuder-Richardson	200	M	.70	
		200	F	.70	
		400	Combined	.70	
National stratified sample Purdue opinion poll	Kuder-Richardson	1000	Combined M & F approxi- mately Equal Ns	.69	Franklin (1963)
10th, 11th, and 12th grades					
Test-retest reliability					
Ohio State University Elementary psychology students	1 month Group administration	30	M	.60	
		30	F	.83	
		60	Combined	.72	
Prisoners Colorado Reformatory	1 month	28	M	.78	Jessor (1964) ^a
Ohio State University Elementary psychology students	2 months 1st group administra- tion 2nd individual admin- istration	63	M	.49	
		54	F	.61	
		117	Combined	.55	
Correlation with Marlowe-Crowne Social Desirability Scale					
Ohio State University Elementary psychology students		166	M	-.16	
		140	F	-.32	
		306	Combined	-.21	
Ohio State University Elementary psychology students		136	M	-.22	Schwarz (1963)
Ohio State University Elementary psychology students		180	F	-.12	Strickland (1962)
Ohio State University Elementary psychology students		103	M	-.17	Watt (1962)
		77	F	-.35	
		180	Combined	-.29	
Kansas State University Elementary psychology students		113	45M, 68F Combined	-.28	Ware (1964) ^a
Ohio Federal prisoners Ages 18-26, 8th grade plus reading		80	M	-.41	Ladwig (1963)

TABLE 2—Continued

Sample	Type	N	Sex	r	Source
Correlation with intellectual measures					
Ohio State University Elementary psychology students	Ohio State Psychological exam.	107	F	-.09	Strickland (1962)
Ohio State University Elementary psychology students	Ohio State Psychological exam.	26	M	.03	Cardi (1962)
		46	F	-.22	
		72	Combined	-.11	
Ohio Federal prisoners Ages 18-26, 8th grade plus reading	Revised beta IQ	80	M	.01	Ladwig (1963)

^a Personal communication.

flect differences in testing conditions. A correlation of $-.22$ represents the median for the different samples of college students where males and females are combined.

The unusually high correlation between the Marlowe-Crowne Social Desirability Scale and the I-E scores for the prisoner population is probably best understood in terms of the testing conditions. These prisoners were tested shortly after entering the reformatory in the admission building during the same period of time when they were receiving other classification tests. They were told that the test was not being given for administrative but experimental purposes and that the test scores would not become part of their permanent records. It is doubtful, however, that many of them believed these instructions. This interpretation tends to be supported (see Table 3) by the fact that the mean score for these prisoners was significantly lower than for college students although one might naturally expect them to be more external than the college student population.

Both the Strickland (1962) sample and Ladwig's (1963) sample of male prisoners show negligible correlations with intelligence. Cardi's (1962) sample, however, suggests a somewhat different relationship for male and female and is consistent with earlier studies of the 60-item scale and the James-Phares scale. In any case, the correlations with intelligence are low.

Means and standard deviations of the I-E scores for a variety of populations are given in Table 3. As in Table 2, if no other source is given the data have been obtained by the author. Appendix B provides cumulative frequencies for 575 males and 605 females of the Ohio State sample. This sample reported in Table 3 and in the appendix includes tests obtained at different times of the year over a 2-year period in a variety of experiments. In all cases, however, the test was given in group administration in psychology classes and does not overlap other samples reported in Table 3.

Sex differences appear to be minimal except in the case of the University of Connecticut sample. In this sample the means tend to be somewhat higher generally than in Midwestern samples, but it is not clear whether this is in fact a sectional difference or results from other factors of selection or testing. One important difference between the University of Connecticut sample and the others was the large size of the University of Connecticut classes, with 303 subjects comprising a single class. The difference between male and female means for this sample was significant.

Although the college Negro population was obtained from psychology classes in an equivalent fashion to the other college samples, it does appear to be slightly more external than the Midwestern college sample but not more external than the University of Connecticut sample. However,

TABLE 3
MEANS AND STANDARD DEVIATIONS OF I-E SCORES FOR SAMPLES OF SEVERAL POPULATIONS

Sample	Testing Conditions	N	Sex	Mean	SD	Source
Ohio State University Elementary psychology stu- dents (combined samples)	Group	575	M	8.15	3.88	
	Experimental	605	F	8.42	4.06	
		1180	Combined	8.29	3.97	
Kansas State University Elementary psychology stu- dents	Group	45	M	7.71	3.84	Ware (1964) ^a
	Experimental	68	F	7.75	3.79	
		113	Combined	7.73	3.82	
University of Connecticut Elementary psychology stu- dents	Group	134	M	8.72	3.59	
	Experimental	169	F	9.62	4.07	
		303	Combined	9.22	3.88	
Florida State University Negro students, psychology classes	Group	116	Combined	9.05	3.66	Gore and Rotter (1963)
	Experimental		62M, 54F			
Peace Corps trainees (three programs combined)	Group	122	M	6.06	3.51	
	Assessment	33	F	5.48	2.78	
		155	Combined	5.94	3.36	
Prisoners, age 18-26	Individual					
8th grade plus reading	Experiment (?)	80	M	7.72	3.65	Ladwig (1963)
Columbus, Ohio 12th grade, college appli- cants	Small groups	41	M	8.46	3.89	Stack (1963)
	(3-12)					
	Experimental	32	F	7.31	3.64	
National stratified sample, Purdue opinion poll 10th, 11th, and 12th grades	Various	1000	Combined	8.50	3.74	Franklin (1963)
			M & F			
			Approximately equal N's			
18-year-old subjects from Boston area	Individual	32	M	10.00	4.20	Crowne and Conn (1965) ^a
		25	F	9.00	3.90	
		57	Combined	9.56	4.10	

^a Personal communication.

significant differences between Negroes and whites in mean I-E scores were obtained by Lefcourt and Ladwig (1965) with comparable samples. They used 60 white and 60 Negro inmates from two correctional institutions who were not significantly different in social class, age, intelligence, or reason for incarceration. Negroes were significantly more external (Means, 8.97) than white offenders (Means, 7.87).

The very low scores for Peace Corps volunteers can be accounted for in two possible ways. The data do not allow determination for which variable was playing the greater role. As a select group we

would expect from a validity point of view that a group of Peace Corps volunteers would be highly internal overall, and, in fact, they were. However, the test was given in three different training groups as part of an assessment battery, and the subjects knew that scores on this as well as other tests would determine in part whether or not they would be judged to be acceptable for appointment as Peace Corps volunteers and sent overseas on assignment. It seems natural that they would interpret the internal response as more desirable under these circumstances. Whether in fact Peace Corps volunteers are more internal than unselected college students will have

to be determined under comparable testing conditions.

White we would expect Peace Corps trainees to be more internal than unselected college students, we would also expect that young male prisoners, most of whom were incarcerated for car stealing, would be more external. This is clearly not the case. However, more internal mean scores can be accounted for on the basis of the high correlation with social desirability under the particular testing conditions (see previous discussion). There seems to be little doubt that scores on this test, as on all personality measures, can be significantly affected by the testing conditions.

The Franklin sample of high school students taken from the Purdue Opinion Poll differs on two important grounds from the samples of Crowne and Conn² and Stack (1963). One difference lies in the fact that the administration procedures are essentially unknown and vary from school to school for the Purdue Opinion Poll sample, but probably include many instances where the tests were administered by the pupils' own teachers or principals. Secondly, and more important, is the fact that the Purdue Opinion Poll is an anonymous poll in contrast to all our other samples in which the subject's name is recorded.

While the Stack sample appears to agree with the anonymous Franklin sample, they are not actually comparable. The Stack study was concerned with reactions to acceptance and rejection for college admission, and his sample was drawn from a group of subjects all of whom were applying for college. The Crowne and Conn sample was drawn from a follow-up of the subjects studied by Sears, Maccoby, and Levin (1957). They were all about 18 years of age, a few were freshmen in college, a few had dropped out of school, but most were seniors in high school.

In summary, it seems most logical that the somewhat higher external scores obtained by Crowne and Conn would be more characteristic of unselected high school students who are given a test under experi-

mental conditions by an examiner who does not have other authority relationships to them. The difference between the Stack sample and the Crowne and Conn sample suggests that students in high school seeking to go to college are more internal than is an unselected high school population.

This interpretation is supported in fact by one of Franklin's (1963) findings that among his subjects those students who intended to go on to college were significantly more internal than those who did not so intend.

Additional Test Characteristics

Two factor analyses have been completed. The first, based on the same 400 cases for which the item correlations are given in Table 1, indicated that much of the variance was included in a general factor. Several additional factors involved only a few items, and only a small degree of variance for each factor could be isolated. These additional factors, however, were not sufficiently reliable to suggest any clear-cut subscales within the test. Franklin (1963) also factor analyzed his 1,000 cases of high school students and obtained essentially similar results. All of the items loaded significantly on the general factor which accounted for 53% of the total scale variance.

In considering discriminant validity, the question of the relationship of the scale to adjustment comes up. Theoretically, one would expect some relationship between internality and good adjustment in our culture but such a relationship might not hold for extreme internal scores. However, there is clearly an interaction between internality and experience of success. The internal subject with a history of failure must blame himself. In regard to the other end of the distribution, externality may act as an adequate defense against failure, but very high scores toward the external end may suggest, at least in our culture, a defensiveness related to significant maladjustment. Extreme scores which were also true scores would suggest a passivity in the face of environmental difficulties,

² Personal communication, 1965.

which, at least for many subjects, would result in maladjustment in our society.

In substance, the relationship between I-E scores and adjustment would not be a linear or a clear one from a theoretical point of view. We might expect seriously maladjusted groups to have more variability on I-E scores and probably more frequently to have high scores in the direction of externality. Within a relatively homogeneous (normal) group such as unselected college students or high school students theoretical expectation would be for a low linear correlation.

Several samples of Ohio State elementary psychology students have been examined for the relationship between the I-E scale and the Rotter Incomplete Sentences Blank (Rotter & Rafferty, 1950). In general, linear correlations have not been significant, and, while some curvilinear correlations have been significant, they are not U-shaped distributions and cannot be explained simply. Ware (1964)³ found a correlation of .24 between the I-E scale and the Taylor Manifest Anxiety scale for his 111 subjects (significant at the 5% level). Efran (1963) used a shortened form of the Taylor Manifest Anxiety scale and of the I-E scale and examined the relationship for 114 combined male and female tenth-, eleventh-, and twelfth-grade high school students. His obtained correlation was .00.

In summary, the test shows reasonable homogeneity or internal consistency, particularly when one takes into account that many of the items are sampling a broadly generalized characteristic over a number of specific or different situations. However, at least with the relatively homogeneous sample studied the test is limited in ability to discriminate individuals. Other populations may provide a greater spread of scores but for college students in the middle 50% of the distribution the test is more suitable for investigations of group differences than for individual prediction. Whether or not a more refined measure of such a broad characteristic can be developed is an open question. Relationships

with such test variables as adjustment, social desirability or need for approval, and intelligence are low for the samples studied and indicate good discriminant validity.

Multimethod Measurement

Campbell and Fiske (1959) have indicated the importance of multimethod measurement in the determination of construct validity of personality tests. Earlier studies with the 60-item scale of the forced-choice I-E test typically produced correlations between .55 and .60 with the earlier James-Phares Likert-type scale. The largest sample studied was that of Blackman (1962), who obtained a correlation of .56 for his 151 elementary psychology student subjects. Florence Johnson (1961) obtained a correlation of .58 for 120 subjects.

Two studies of nonquestionnaire approaches to the measurement of internal-external control have been made with the 23-item scale. Adams-Webber (1963) compared the forced-choice I-E scores with scores from a story-completion test. The story beginnings involved a central character who initiates an "immoral" course of action. Scoring was based upon whether the consequences of this act in the story completions appeared to follow from the individual's behavior or were caused by it or were more a function of external conditions or agents. Judges rated story endings from a crude manual. Adams-Webber analyzed his data by dividing his 103 subjects into groups based on the number of external endings for his three story completions. Analysis of variance indicated a highly significant difference among the groups ($p = <.001$). The "projective" test of tendency to see punishment for moral transgression as being externally imposed or as being the result of the immoral behavior was significantly related to I-E scale scores.

In a study of academic failure, Cardi (1962) developed a measure of internal-external control from a semistructured interview which ranged from 35 minutes to an hour. Judges' ratings following a man-

³ Personal communication, 1964.

ual were correlated with I-E scale scores obtained at an earlier time and independently of the interview. As in the Adams-Webber study the judges' ratings were satisfactorily reliable. She obtained a biserial correlation of .61 ($p = <.002$) for her 25 subjects between subjects rated high or low from the interview data and I-E scale scores. The variable being studied here is capable of reliable measurement by a variety of test methods.

Social Class Differences in Internal-External Control

When the Warner scale based on father's occupation was used, studies of the Ohio State samples of elementary psychology students did not show significant social-class differences. However, the college student population utilized was highly homogeneous. Similarly, Gore and Rotter (1963) failed to find significant social-class differences in a somewhat lower social class but similarly homogeneous grouping at a southern Negro college. Studies with younger or noncollege age samples, however, have shown differentiation. Franklin (1963) recorded a significant relationship between higher socioeconomic class and internality based on his national stratified sample of 1,000 cases. Battle and Rotter (1963), using Negro and white sixth- and eighth-grade children and a projective type test, did find a significant social-class effect with race and intellectual level controlled. There was also a significant effect for race, but most of the variance was accounted for by an interaction in which the lower-class Negroes were considerably more external than the groups of middle-class Negroes or upper- or lower-class whites. This finding is similar to the Lefcourt and Ladwig (1965) study of Negro and white prisoners, most of whom were lower socioeconomic class.

Political Affiliation

One analysis of the relationship of the test to political identification has been made. This study included 114 Ohio State elementary psychology college students. No significant differences were found in the mean scores of 49 students who identi-

fied themselves as Republican, 20 who identified themselves as Democrats, and 45 who said they were independent or not identified with either major party. With the earlier 60-item scale Johnson (1961) found no significant differences in I-E scale scores between 73 college student supporters of Nixon and 47 supporters of Kennedy. However, such results may not be typical of another geographical area where there are sharper differences in political liberalness between the two major parties.

Children's Tests of Internal-External Control

Three measures of internal-external control for children have been devised. The first of these by Bialer (1961) was modified from the James-Phares scale. It is a 23-item questionnaire with yes-no responses. With younger children the items are read, and the child answers yes or no. A typical item is, "Do you really believe a kid can be whatever he wants to be?"

Crandall, Katkovsky, and Preston (1962) developed a scale (Intellectual Achievement Responsibility—IAR) for "self-responsibility" in achievement situations. The items dealt with whether or not the child felt that he, rather than other persons, usually caused the successes and failures he experienced in intellectual achievement situations. The child chose between alternatives as in the following example: "Suppose you did better than usual in a subject at school. Would it probably happen (a) because you tried harder, or (b) because someone helped you?"

A third test for children, more projective in nature, was developed by Battle and Rotter (1963). This test presented the subject with six situations modeled on the Rosenzweig picture frustration approach. The child was told how he would fill in the balloon, as in comic strips, for an outline drawing: for example, where one child is saying, "How come you didn't get what you wanted for Christmas?". A reliable scoring manual for this test was developed. This projective measure correlated significantly (.42) with the Bialer questionnaire in a group of 40 white and Negro children.

Data obtained from all three of these tests will be referred to in the following section.

PERSONAL CORRELATES OF A GEN-
ERALIZED EXPECTANCY FOR IN-
TERNAL-EXTERNAL CONTROL:
CONSTRUCT VALIDITY OF THE
I-E MEASURES

Performance in Controlled Laboratory Tasks

The first investigations of individual differences in the I-E variable were made in connection with learning or performance tasks in which skill and chance instructions were given. Phares (1957) obtained prediction bordering on significance for 13 chance-oriented items for individual differences in the size of the increments or decrements following success and failure and in the frequency of unusual shifts within conditions: that is, those shifts in expectancy where the subject raises his expectancy after a failure or lowers it after a success.

James (1957), in the previously cited experiment, found low but significant prediction with revised scale and individual differences *within* each condition. In each case the behavior of externals differed from that of internals in the same way that the overall population differed under chance instructions as compared with skill instructions. James found that the size of increments and decrements in expectancies following reinforcement, the frequency of unusual shifts, the tendency to generalize from one task to another, and the number of trials to extinction were significantly related to his questionnaire of internal-external control.

Later studies using task differences rather than instructions and in some cases other types of tasks have not been as successful as James in predicting individual differences within conditions using either the James-Phares scale or the more recent I-E scale. More consistent prediction has been made of the frequency of unusual shifts during a controlled reinforcement sequence. Several investigations have found this difference to be significant or near significant and the trend is always in the

same direction, namely, that externals tend to produce more unusual (or gambler's fallacy) shifts. Battle and Rotter (1963) also found that the Bialer scale significantly predicted the number of unusual shifts for sixth- and eighth-grade Negro and white children.

Liverant and Scodel (1960) examined the preferences for bets in a dice-throwing situation using the earlier 60-item version of the I-E scale. They found that subjects scoring toward the internal end of the scale tended to prefer intermediate probability bets or extremely safe bets over the long shots and that they tended to wager more money on safe as against risky bets when compared to those subjects scoring at the external end of the continuum.

In general, individual prediction in competitive laboratory situations for college students has been only partially successful. Apparently, the rather narrow range of internal-external control attitudes in college students and the strong situational determination of the competitive laboratory tasks limits prediction. The behavior most susceptible to individual prediction is that which deals most directly with risk taking and expectancies of the real influence of luck as demonstrated by belief in the gambler's fallacy.

Attempts to Control the Environment

In the following sections for the sake of brevity subjects in the upper half of the distribution of scores on the I-E scale or other measures will be referred to as externals and those in the lower half as internals. It should be made clear that we are dealing here with only one variable affecting behavior and that we are *not* implying a typology of any kind. In fact, in some of the studies involving college populations those subjects being characterized as relatively more external may in fact be more internal on the average than the mean of the population at large.

Perhaps the most important kind of data to assess the construct validity of the internal-external control dimension involves the attempts of people to better their life conditions, that is, to control their environment in important life situations. It is in

this sense that the I-E scale appears to measure a psychological equivalent of the sociological concept of alienation, in the sense of powerlessness. The first study of this type was undertaken by Seeman and Evans (1962), who employed a revision of the 60-item I-E scale not too different from the later-developed 23-item scale. They investigated the behavior of patients in a tuberculosis hospital, measuring how much they knew about their own condition, how much they questioned doctors and nurses about their own condition, and how satisfied they were with the amount of feedback they were getting about their medical status. They used 43 matched pairs of white male patients, each pair being matched for occupational status, education, and ward placement. As hypothesized, they found that the internals knew more about their own condition, questioned the doctors and nurses more (according to doctors' and nurses' independent ratings), and expressed less satisfaction at the amount of feedback or the information they were getting about their condition from the hospital personnel.

Seeman (1963) followed this study with one of reformatory inmates, investigating memory for various kinds of information which they were exposed to in incidental fashion. He found a significant correlation, independent of intelligence, between internality-externality and the amount of information remembered about how the reformatory was run, parole, and long-range economic facts which might affect the persons after they left the reformatory.

Gore and Rotter (1963) obtained signed commitments from students at a southern Negro college regarding activities to be undertaken during vacation in behalf of the civil rights movement. Students who were willing to take part in a march on the state capitol or to join a freedom riders' group were clearly and significantly more internal than those who were only willing to attend a rally, were not interested in participating at all, or avoided even filling out the requested form. Since these were all-Negro students who must have had high involvement in the integration issue, the willingness of some to take part in active

attempts to change, and others not to, must have been related to their own generalized expectancy that their behavior could, in fact, effect a change in the prejudice which surrounded them as well as other variables. While this study had strong face validity, in that the students who signed up for these activities expected to take part in them, no follow-ups were made as to whether or not they actually did take part. A study by Strickland (1965) investigated activists in a Negro civil rights movement in a different state in comparison to Negroes matched for education and socioeconomic status who did not take part in such issues. She again found a significant difference with the activists more internal on the I-E scale.

Phares (1965) in a more stringent test of a generality of internal-external control attitudes selected two samples, one internal and one external, on the I-E scale but matched for the attitudes towards maintaining fraternities and sororities on campus. He instructed both groups to act as experimenters to change the attitudes of other students. He found, as hypothesized, that his internal subject-experimenters were significantly more successful in changing attitudes of others than the external subject-experimenters, who did not differ significantly in the amount of change achieved from a control group who were not subject to any influence condition.

In two separate studies the author has investigated the relationship between petition signing and internal-external control. In both instances, subjects were given the opportunity to sign petitions pro or con some issue such as Red China's being admitted to the United Nations or pro or con postseason football games, on the pretext that only by providing both alternatives could the petitions be passed out in classes. It was hypothesized that internality on the test would relate to signing the petitions in either direction versus nonsigning. In both cases, the I-E scale failed to predict who would be signers and who would not. Whether or not the signing of a petition under classroom conditions involves other variables which were not taken into account and masked any internal-external

control variance was not clear. In any case, the test failed to predict petition signing under these conditions.

A recent investigation in this area involves a different cultural population. Seeman (1964)⁴ studied workers in Sweden with a translated version of the I-E scale. Seeman's results seem to point clearly to the fact that membership in unions versus nonmembership, activity within the union, and general knowledge of political affairs were all significantly related to internality. Correlations were low but significant and held up when controlled for variables such as education, age, and income.

Perhaps related to this feeling that one can control the environment is also a feeling that one can control himself. Some studies of the relationship of internal-external control to smoking perhaps are relevant. Straits and Sechrest (1963) found that non-smokers were significantly more internal than smokers, and James, Woodruff, and Werner (1965) replicated that finding and in addition reported that following the Surgeon General's report, among male smokers, those who quit and did not return to smoking in a specified period of time were more internal than those who believed the report but did not quit smoking. The difference was not significant for females who apparently were motivated by other variables including, for example, the tendency to gain weight when not smoking.

This group of studies lends strong and relatively consistent support to the hypothesis that a generalized expectancy—that one can affect the environment through one's own behavior—is present in at least two different cultures, can be reliably measured, and is predictive of logical behavioral construct referents.

While significant correlations have been referred to throughout this section, it should be made clear that for the most part they are low and leave room for much in the way of specific attitudes in the particular areas of behavior that were investigated. Perhaps some explanation may be called for here for the fact that variance due to the specific situation was not ac-

counted for by the two factor analyses of the test. In the factor analyses done by the author, several factors involving small but significant variance were isolated, each involving only two or three items with significant loadings. These factors, however, were highly specific and did not constitute broad enough *subareas* to appear useful to the author. It must also be remembered that most items involving achievement had to be dropped from the scale because of their apparently great susceptibility to social desirability influence.

Internal-External Control and Achievement Motivation

It would seem a logical extension of the notion of internal-external control that those at the internal end of the scale would show more overt striving for achievement than those who felt they had little control over their environment. However, there are two limitations on the potential strength of this relationship, particularly as it applies to college students or adults. One of these is that among college students and adults, particularly with males, there are more defensive externals or people who have arrived at an external view as a defense against failure but who were originally highly competitive. Many such people still maintain striving behavior in clearly structured competitive situations but defensively account for failures by expressed external attitudes. The other limitation is one of specificity in that internal-external control attitudes are obviously not generalized across the board, and in the highly structured academic achievement situation there is probably more specificity determining response than in other kinds of situations. With children who have less experience in the competitive academic situation, a higher relationship could be anticipated than with a select population of college students.

The Crandall et al. (1962) scale (IAR) developed for use with children is specific to the achievement area and Crandall et al. did find free play achievement behavior and achievement test scores in boys but not in girls related to test scores. Neither the Children's Manifest Anxiety scale nor the

⁴ Unpublished manuscript.

Thematic Apperception Test (TAT) achievement measure predicted either boys' or girls' achievement behavior.

Cellura⁵ found a direct relationship between the SRA academic achievement test, with IQ partialled out, of lower socioeconomic status boys and the IAR scale. Crandall's subjects were predominantly middle class, and Cellura's were all in Hollingheads' fourth and fifth categories.

In Franklin's (1963) study of high school students involving the national stratified sample of 1,000, he hypothesized 17 relationships of the I-E scale to *reported* evidences of achievement motivation. These included such things as early attempts to investigate colleges, intention to go to college, amount of time spent doing homework, parents' interest in homework, etc. He found a significant relationship in the predicted direction in 15 of his 17 relationships.

A study by Efran (1963) produced an indirect but extremely interesting indication of the relationship between striving for achievement and internal-external control. Using a balanced-order controlled procedure he studied high school students' tendency to forget (repress) failures versus successes and found that the tendency to forget failures was significantly related to scores towards the internal end of the dimension. It is possible that the functional value of a defensive tendency towards externality is indicated by these findings. The results suggest that the external has less need to "repress" his failures since he has already accepted external factors as determining his success and failure to a greater extent than those subjects scoring as more internal on the I-E control scale.

A study by Rotter and Mulry (1965) also supports the stronger motivation of internals in achievement situations. In this study, 120 male and female unselected subjects were placed in an angle-matching situation of extreme difficulty. Half of the subjects were instructed that the task was so difficult as to be chance determined and half that it was difficult but that previous

data had shown that some people were very good at it. All subjects were then given eight trials of which 75% were positively reinforced, followed by an extinction series of no correct answers until their verbalized expectancies reached 1 or 0 for two consecutive trials. Within the skill and chance groups, subjects were divided into internals and externals at the median. Decision time was measured for all subjects from the time they were given the sample for judging until they selected a standard. The subject was unaware that he was being timed. Analysis of variance produced a significant interaction. Internals took longer to decide on a matching standard under skill conditions than did externals but took a shorter time under chance conditions than did externals. Most of the difference was attributed to the internals who had very long decision times under skill conditions and very short times under chance conditions, these being significantly different. The externals took longer under chance conditions than under skill conditions but the difference was not significant. The result not only shows the greater involvement of internals under skill conditions but in general suggests that internals tend to value reinforcements for skill much more than chance, and if the opposite cannot be said for the more external subjects of this study, it is at least clear that there is no significant differentiation for them.

In summary, the expected relationship between the tendency to perceive what happens to a person as dependent upon his own actions and greater motivation in achievement is generally supported although prediction was not consistent for boys and girls using the Crandall et al. scale with children.

Internal-External Control and Resistance to Subtle Suggestion

One other area of construct validity has been investigated in some depth. This involves the variables of independence, suggestibility, and conformity as related to internal-external control. It seems that internals would be more resistive to manipulation from the outside if, in fact, they are aware of such manipulation. If they were aware, they would feel deprived of some of

⁵Unpublished manuscript, "Internality as a determinant of academic achievement in low SES adolescents," Syracuse University, 1963.

their control of the environment. Externals expecting control from the outside would be less resistive. One special consideration here, however, is in the area of conformity. If the internally oriented person perceives that it is to his advantage to conform he may do so consciously and willingly without yielding any of his control. It is only where it might be clearly to his disadvantage that he would resist conformity pressures.

An investigation of the latter hypothesis was carried out by Crowne and Liverant (1963). They studied unselected college students, dividing them at the median into internals and externals and observing them in an Asch conformity situation. Under one set of conditions the usual Asch instructions were used. In the second set of conditions, subjects were given a certain amount of money and allowed to bet on each of their judgments. Subjects could choose to bet or not to bet and could determine the amount they were willing to bet on each judgment. In the normal Asch situation, there were no differences between internals and externals in the amount of yielding. However, under betting conditions the internals yielded significantly less than the externals. They also bet more on themselves when going against the majority than did externals on their independent trials. The internals had no significant differences between their bets on conforming and independent trials, but the externals bet significantly less on independent trials than they did on trials on which they yielded.

Other tests of the tendency to yield to external influence were obtained from studies of Strickland (1962) and Getter (1962) relating scores on the I-E scale to verbal conditioning. On the basis of a thorough postexperimental interview, Strickland divided her subjects into those who were aware of the reinforcement contingency and those who were not. In addition, of those who were aware she divided those who conditioned from those who did not. While she found no overall relationship between conditionability and I-E scale scores, she did find large and significant differences between those subjects who

were aware and did not condition and those subjects who were aware and did condition. As expected, the subjects who were aware and did not condition were considerably more internal than those who were aware and did condition.

The study by Getter involving a somewhat different technique produced a fairly large number of latent conditioners. That is, subjects who showed no significant evidence of conditioning during the training trials, but during extinction when no reinforcement was given, showed a significant rise in the reinforced response. Again, these subjects were significantly more internal than either subjects who did not show such latent conditioning among non-conditioners or who conditioned during the training trials.

Both of these studies suggest a kind of negativism to external manipulation on the part of internals. However, a study by Gore (1962) helps to clarify this issue. Gore used an experimenter influence paradigm in which she presented TAT cards to three groups of subjects, ostensibly to determine which cards produced longer stories. One condition involved overt influence in which she specified which card she thought was the best. The second condition involved subtle influence in which she presented the same card, saying to the subjects and smiling, "Now let's see what you do with *this* one." The third condition was a control condition of no influence. She also used unselected subjects dividing them at the median into internals and externals. Her results showed no significant differences between internals and externals under the overt suggestion condition and control condition, but under the subtle suggestion condition the internals produced significantly shorter stories than did externals and significantly shorter stories than did control subjects in the no suggestion condition. It is under the subtle suggestion conditions they reacted by telling shorter stories or were, in fact, negativistic. However, in the overt condition, there were no traces of this negativism. Apparently, when given the conscious choice the internal is not resistive. However, when he is aware that an attempt is being made to

subtly manipulate him he does become resistive.

The four studies taken as a whole support one another. The individual who perceives that he does have control over what happens to him may conform or may go along with suggestions when he chooses to and when he is given a conscious alternative. However, if such suggestion or attempts at manipulation are not to his benefit or if he perceives them as subtle attempts to influence him without his awareness, he reacts resistively. The findings have considerable significance for the general area of persuasion and propaganda.

Antecedents of Internal-External Attitudes

Relatively little work has been done on antecedents for developing attitudes of internal versus external control. The consistent indication that lower socioeconomic level groups are more external allows for a number of alternative explanations. Graves (1961) predicted and found differences among Ute Indians, children of Spanish-American heritage, and whites in an isolated triethnic community. As he expected the Indians are most external, the Spanish-Americans in the middle, and the whites more internal. The implication is for direct cultural teaching of internal-external attitudes since, in fact, the Spanish-Americans were financially more deprived than the Indians although it is true that the Indians who were partially supported by the government had fewer occupational outlets. In support of this interpretation of the influence of direct teaching, Shirley Jessor (1964)⁶ found a correlation of .38 between mothers' coded answers to interview questions of internal-external attitudes and responses of their high school children to a 23-item questionnaire similar to the 23-item scale described here. Her sample included 81 pairs drawn from the same cross-cultural sample.

In the previously cited study by Battle and Rotter (1963), the highly external group was the low-socioeconomic-level Negro group in contrast to middle-class Negroes or whites of either lower- or middle-class identification. Interestingly enough,

within this group there was a significant relationship between intelligence and externality. This relationship was counter to the socioeconomic level findings. It was the more intelligent Negro children in the lower socioeconomic level who were the most external. The findings are based on a small *N* and may be regarded as only suggestive. However, what they imply is that the perception of limited material opportunities and of powerful external forces is one variable making for an external attitude. Similarly, Cellura (See Footnote 5) found that with both the Bialer scale and the Crandall et al. IAR scale the parents of the more external children had significantly lower education levels.

One investigation with college student subjects attempted to relate orthodoxy of religious beliefs to internal-external control (Rotter, Simmons, & Holden, 1961⁷) using the McLean scale which measures belief in the literalness of the Bible. No relationship was found. With other college student groups there were no significant differences between individuals of one religious faith versus another. Interviews with individual subjects in a college population at least suggest that religion may well have a role in the development of internal or external attitudes. However, it is the specific emphasis that is placed upon the role of external fatalistic determination by parents which is more likely to determine the attitude than the abstract doctrines of the sect. These studies bearing on the problem of antecedents of internal-external beliefs are indirect, and work needs to be done in this area of investigation. One obvious antecedent worthy of study would be the consistency of discipline and treatment by parents. Clearly it would be expected that unpredictable parents would encourage the development of attitudes of external control.

SUMMARY

The studies reported here represent an unusually consistent set of findings. For most findings there are replications sometimes in other laboratories, sometimes with other kinds of populations, and sometimes

⁶ Personal communication, 1964.

⁷ Unpublished manuscript, 1961.

with different methods of measurement and techniques of producing condition or situational effects. The broad findings are summarized below.

1. People in American culture have developed generalized expectancies in learning situations in regard to whether or not reinforcement, reward, or success in these situations is dependent upon their own behavior or is controlled by external forces, particularly luck, chance, or experimenter control, which are fairly consistent from individual to individual. If subjects perceive a situation as one in which luck or chance or experimenter control determines the reinforcements, then they are less likely to raise expectancies for future reinforcement as high following success, as if they perceived the reinforcement to be dependent upon skill or their own efforts. Similarly, they are less likely to lower expectancies as much after failure. They are less likely to generalize experiences of success and failure or expectancies of future reinforcement as much from one task to another similar task. The pattern of extinction is markedly different involving a reversal of the typical 100% versus 50% partial reinforcement findings. When perceived as skill determined, 100% reinforcement takes longer to extinguish than does 50% reinforcement. Finally, under conditions where they perceive the task as luck, chance, or experimenter controlled they are more likely to raise expectancies after a failure or to lower them after a success. In general, under skill conditions behavior of a subject follows what might be considered a more logical or commonsense model. It is particularly important that many of the learning paradigms utilized by psychologists are of the type where reward is experimenter controlled. These results suggest that generalizing "laws of learning" from such studies is a dangerous procedure. In substance, one main interpretation of these studies is that research in human learning should be understood or interpreted in light of the position on a continuum of internal to external control that the task and procedure will be perceived by the subjects.

2. Not only do subjects in general dif-

ferentiate learning situations as internally or externally determined but individuals differ in a generalized expectancy in how they regard the same situation. Such generalized expectancies can be measured and are predictive of behavior in a variety of circumstances. These characteristic differences in viewing behavior-reinforcement contingencies can be measured in children and adults by different methods with reasonably high intercorrelations between different methods of measurement.

3. Data are presented on one scale for measuring individual differences in generalized expectancy for internal-external control which has been used in the largest number of studies of this variable. This is a forced-choice 29-item scale including 6 filler items. Item analysis and factor analysis show reasonably high internal consistency for an additive scale. Test-retest reliability is satisfactory, and the scale correlates satisfactorily with other methods of assessing the same variable such as questionnaire, Likert scale, interview assessments, and ratings from a story-completion technique. Discriminant validity is indicated by the low relationships with such variables as intelligence, social desirability, and political liberalness. Differences in means of selected populations is generally a weak criterion of validity. Nevertheless, differences obtained for different types of populations are generally consistent with expectancies.

4. Most significant evidence of the construct validity of the I-E scale comes from predicted differences in behavior for individuals above and below the median of the scale or from correlations with behavioral criteria. A series of studies provides strong support for the hypotheses that the individual who has a strong belief that he can control his own destiny is likely to (a) be more alert to those aspects of the environment which provide useful information for his future behavior; (b) take steps to improve his environmental condition; (c) place greater value on skill or achievement reinforcements and be generally more concerned with his ability, particularly his failures; and (d) be resistive to subtle attempts to influence him.

APPENDIX A

INSTRUCTIONS FOR THE I-E SCALE

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 rather 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. **RE-MOVE 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 more 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.

APPENDIX B

TABLE B1

DISTRIBUTION OF I-E SCALE SCORES FOR 575 MALES AND 605 FEMALE OHIO STATE
ELEMENTARY PSYCHOLOGY STUDENTS

Males ^a			Females ^b		
I-E score	f	Cum. %	I-E score	f	Cum. %
20	1	100.00	21	1	100.00
19	1	99.83	20	1	99.83
18	4	99.65	19	3	99.67
17	10	98.96	18	7	99.17
16	10	97.22	17	10	98.02
15	10	95.48	16	8	96.36
14	15	93.74	15	17	95.04
13	31	91.13	14	23	92.23
12	32	85.74	13	37	88.43
11	32	80.17	12	31	82.31
10	49	74.61	11	42	77.19
9	53	66.09	10	42	70.25
8	73	56.87	9	64	63.31
7	52	44.17	8	53	52.73
6	52	35.13	7	50	43.97
5	41	26.09	6	66	35.70
4	43	18.96	5	37	24.79
3	29	11.48	4	42	18.68
2	22	6.43	3	37	11.74
1	10	2.61	2	22	5.62
0	5	0.87	1	8	1.98
			0	4	0.66

^a $N = 575$; Mean = 8.15; $SD = 3.88$.

^b $N = 605$; Mean = 8.42; $SD = 4.06$.

REFERENCES

- ADAMS-WEBBER, J. Perceived locus of control of moral sanctions. Unpublished master's thesis, Ohio State University, 1963.
- ANGYAL, A. *Foundations for a science of personality*. New York: Commonwealth Fund, 1941.

- ATKINSON, J. W. (Ed.) *Motives in fantasy action and society*. Princeton: D. Van Nostrand, 1958.
- BATTLE, ESTHER S., & ROTTER, J. B. Children's feelings of personal control as related to social class and ethnic group. *Journal of Personality*, 1963, **31**, 482-490.
- BENXTON, R. C. Task, trial by trial score variability of internal versus external control of reinforcement. Unpublished doctoral dissertation, Ohio State University, 1961.
- BIALER, I. Conceptualization of success and failure in mentally retarded and normal children. *Journal of Personality*, 1961, **29**, 303-320.
- BLACKMAN, S. Some factors affecting the perception of events as chance determined. *Journal of Psychology*, 1962, **54**, 197-202.
- CAMPBELL, D. T., & FISKE, D. W. Convergent and discriminant validation by multitrait-multimethod matrix. *Psychological Bulletin*, 1959, **56**, 81-105.
- CARDI, MIRIAM. An examination of internal versus external control in relation to academic failures. Unpublished master's thesis, Ohio State University, 1962.
- COHEN, J. *Chance, skill and luck*. Baltimore: Penguin Books, 1960.
- CRANDALL, V. J. Achievement. In Harold W. Stevenson et al. (Eds.), *National Society for the Study of Education Yearbook: Part I. Child psychology*. Chicago: Univer. Chicago Press, 1963.
- CRANDALL, V. J., KATKOVSKY, W., & PRESTON, ANNE. Motivational and ability determinants of young children's intellectual achievement behaviors. *Child Development*, 1962, **33**, 643-661.
- CROWNE, D. P., & LIVERANT, S. Conformity under varying conditions of personal commitment. *Journal of Abnormal and Social Psychology*, 1963, **66**, 547-555.
- CROWNE, D. P., & MARLOWE, D. *The approval motive*. New York: Wiley, 1964.
- EFRAIM, J. S. Some personality determinants of memory for success and failure. Unpublished doctoral dissertation, Ohio State University, 1963.
- FEATHER, N. T. Subjective probability and decision under uncertainty. *Psychological Review*, 1959, **66**, 150-164.
- FRANKLIN, R. D. Youth's expectancies about internal versus external control of reinforcement related to *N* variables. Unpublished doctoral dissertation, Purdue University, 1963.
- GETTER, H. Variables affecting the value of the reinforcement in verbal conditioning. Unpublished doctoral dissertation, Ohio State University, 1962.
- GOONOW, JACQUELINE J., & PETTIGREW, T. F. Effects of prior patterns of experience upon strategies and learning sets. *Journal of Experimental Psychology*, 1955, **49**, 381-389.
- GOONOW, JACQUELINE J., & POSTMAN, L. Probability learning in a problem-solving situation. *Journal of Experimental Psychology*, 1955, **49**, 16-22.
- GORE, PEARL MAYO. Individual differences in the prediction of subject compliance to experimenter bias. Unpublished doctoral dissertation, Ohio State University, 1962.
- GORE, PEARL MAYO, & ROTTER, J. B. A personality correlate of social action. *Journal of Personality*, 1963, **31**, 58-64.
- GRAVES, T. D. Time perspective and the deferred gratification pattern in a tri-ethnic community. Unpublished doctoral dissertation, University of Pennsylvania, 1961.
- HARLOW, H. F. The formation of learning sets. *Psychological Review*, 1949, **56**, 51-65.
- HOLDEN, K. B., & ROTTER, J. B. A nonverbal measure of extinction in skill and chance situations. *Journal of Experimental Psychology*, 1962, **63**, 519-520.
- JAMES, W. H. Internal versus external control of reinforcement as a basic variable in learning theory. Unpublished doctoral dissertation, Ohio State University, 1957.
- JAMES, W. H., & ROTTER, J. B. Partial and 100% reinforcement under chance and skill conditions. *Journal of Experimental Psychology*, 1958, **55**, 397-403.
- JAMES, W. H., WOODRUFF, A. B., & WERNER, W. Effect of internal and external control upon changes in smoking behavior. *Journal of Consulting Psychology*, 1965, **29**, 184-186.
- JOHNSON, FLORENCE Y. Political attitudes as related to internal and external control. Unpublished master's thesis, Ohio State University, 1961.
- LADWIG, G. W. Personal, situational and social determinants of preference for delayed reinforcement. Unpublished doctoral dissertation, Ohio State University, 1963.
- LEFCOURT, H. M., & LADWIG, G. W. The American Negro: A problem in expectancies. *Journal of Personality and Social Psychology*, 1965, **1**, 377-380.
- LINTON, HARRIET R. Dependence on external influence: Correlations in perceptions, attitudes and judgment. *Journal of Abnormal and Social Psychology*, 1955, **51**, 502-507.
- LIVERANT, S., & SCODEL, A. Internal and external control as determinants of decision making under conditions of risk. *Psychological Reports*, 1960, **7**, 59-67.
- MCCLELLAND, D., ATKINSON, J. W., CLARK, R. A., & LOWELL, E. L. *The achievement motive*. New York: Appleton-Century-Crofts, 1953.
- MERTON, R. *Mass persuasion*. New York: Harpers, 1946.
- MERTON, R. Social structure and anomie. In *Social theory and social structure*. Glencoe, Ill.: Free Press, 1949, 125-149.
- NETTLER, G. A measure of alienation. *American Sociological Review*, 1957, **22**, 670-677.
- PEPITONE, A. Attributions of causality, social attitudes and cognitive matching processes. In R. Taguiri & L. Petrillo (Eds.), *Person perception and interpersonal behavior*. Stanford, Calif.: Stanford University Press, 1958. Pp. 258-276.

- 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.
- PHARES, E. J. Internal-external control as a determinant of amount of social influence exerted. *Journal of Personality and Social Psychology*, 1965, **2**, 642-647.
- PIAGET, J. *The child's conception of physical causality*. New York: Harcourt, Brace, 1930.
- RIESMAN, D. *Individualism reconsidered*. Glencoe, Ill.: Free Press, 1954.
- ROTTER, J. B. *Social learning and clinical psychology*. Englewood Cliffs: Prentice-Hall, 1954.
- ROTTER, J. B. The role of the psychological situation in determining the direction of human behavior. In M. R. Jones (Ed.), *Nebraska symposium on motivation*. Lincoln: Univer. Nebraska Press, 1955. Pp. 245-269.
- ROTTER, J. B. Some implications of a social learning theory for the prediction of goal directed behavior from testing procedures. *Psychological Review*, 1960, **67**, 301-316.
- ROTTER, J. B., LIVERANT, S., & CROWNE, D. P. The growth and extinction of expectancies in chance controlled and skilled tests. *Journal of Psychology*, 1961, **52**, 161-177.
- ROTTER, J. B., & 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., & RAFFERTY, JANET E. *The Rotter Incomplete Sentences Blank manual: College form*. New York: Psychological Corporation, 1950.
- SCHWARZ, J. C. Factors influencing expectancy change during delay in a series of trials on a controlled skill task. Unpublished doctoral dissertation, Ohio State University, 1963.
- SEARS, R. R., MACCOBY, ELEANOR, & LEVIN, H. *Patterns of childrearing*. Evanston: Rowe Peterson, 1957.
- SEEMAN, M. On the meaning of alienation. *American Sociological Review*, 1959, **24**, 782-791.
- SEEMAN, M. Alienation and social learning in a reformatory. *American Journal of Sociology*, 1963, **69**, 270-284.
- SEEMAN, M. Social learning theory and the theory of mass society. Paper read at the annual meeting of the American Sociological Society. Los Angeles, 1963.
- SEEMAN, M., & EVANS, J. W. Alienation and learning in a hospital setting. *American Sociological Review*, 1962, **27**, 772-783.
- SROLE, L. Social integration and certain corollaries: an exploratory study. *American Sociological Review*, 1956, **21**, 709-716.
- STACK, J. J. Individual differences in the reduction of cognitive dissonance: an exploratory study. Unpublished doctoral dissertation, Ohio State University 1963.
- STRAITS, B. C., & SECHREST, L. Further support of some findings about characteristics of smokers and non-smokers. *Journal of Consulting Psychology*, 1963, **27**, 282.
- STRICKLAND, BONNIE R. The relationships of awareness to verbal conditioning and extinction. Unpublished doctoral dissertation, Ohio State University, 1962.
- STRICKLAND, BONNIE R. The prediction of social action from a dimension of internal-external control. *Journal of Social Psychology*, 1965, **66**, 353-358.
- VEBLEN, T. *The theory of the leisure class*. New York: MacMillan, 1899 (Modern Library edition, 1934).
- WATT, N. F. The relation of public commitment, delay after commitment, and some individual differences to changes in verbalized expectancies. Unpublished doctoral dissertation, Ohio State University, 1962.
- WHITE, R. W. Motivation reconsidered: The concept of competence. *Psychological Review*, 1959, **66**, 297-333.
- WETKIN, H. A., LEWIS, HELEN B., HERTZMAN, M., MACHOVER, KAREN, MEISSNER, PEARL B., & WAPNER, S. *Personality through perception*. New York: Harper, 1954.
- WYCKOFF, L. B., & SIDOWSKI, J. G. Probability discrimination in a motor task. *Journal of Experimental Psychology*, 1955, **50**, 225-231.

(Received May 26, 1965)