EFFECTS OF BRIEF PERSISTENCE TRAINING ON THE CUE DISCRIMINATION TASK PERFORMANCE OF EXTERNALLY AND INTERNALLY CONTROLLED ELEMENTARY SCHOOL STUDENTS

DISSERTATION

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by

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The problem with which this investigation is concerned is one of increasing the goal-striving and achievement behavior of externally controlled students. The present study was designed to test the efficacy of short-term persistence training. The purpose of the training was to alter temporarily the cue discrimination and paired-associate memory task outcomes of externally controlled students.

Subjects were selected from among those 140 students comprising the fourth- and fifth-grades at a private school where the student population is chosen after highly selective testing procedures with regard to superior academic ability. Those forty-five students scoring most internal and those forty-five students scoring most external on a locus of control questionnaire (Intellectual Achievement Responsibility Questionnaire) represented the internal and external groups respectively. These subjects were then randomly assigned to one of three treatment conditions: control, persistence training, or pretested persistence training. The control group was given pretested training; the
persistence training group was given its similar, more extensive training; and the pretested persistence training group received both treatments. Each group received the two dependent variable learning tasks (cue discrimination and paired-associate) consecutively and immediately following the treatment procedures.

While internals were generally expected to outperform externals on the learning tasks, it was hypothesized that the special training would serve to improve significantly the usually attenuated performance of the external students. This improvement effect was expected to be greater for externals (who were expected to do more poorly initially) than internals; it was predicted that there would be no significant difference between the two groups after persistence training. It was further hypothesized that these relationships would be consistent across both similar and dissimilar tasks, supporting the generalizability of the persistence training.

It was found that persistence training had no significant effect on either the cue discrimination or paired-associate memory task performance of the students. Surprisingly, internals failed to do better than externals, regardless of the type of persistence training or the task employed. Although the total internality IARQ scores of the students in this study were comparable to those of the
standardized norm of the IARQ, the students did not perform as might have been expected from the review of the literature. Because persistence training failed to enhance the students' cue discrimination or paired-associate memory task performance, it was concluded that brief persistence training was ineffective. However, because externals performed comparably to internals it was also concluded that the locus of control dimension was not predictive of achievement on these tasks for these students. This finding was in opposition to most related literature. Further research was therefore recommended comparing the performance of bright, high achieving externals (like those in the present investigation) with that of more typical external students (e.g. public school externals).
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CHAPTER I

INTRODUCTION

Reinforcement is a major determinant of behavior. It has been noted, however, that the effect of reinforcement is not a simple stamping in process but depends on whether or not the person perceives a causal relationship between his own behavior and his reward. Internal-external locus of control refers to the extent to which persons perceive dependent relationships between their actions and their outcomes. People who believe they have some control over their destinies are called "internals"; they believe that at least some control resides within themselves. "Externals", on the other hand, believe that their outcomes are determined by factors extrinsic to themselves.

In a recent review regarding the locus of control literature, it was stated that: "Over 50 per cent of the . . . literature can be summarized by saying that internals and externals occupy different positions on the instrumental-expressive behavior dimension" (2, p. 171). Internals typically engage in more instrumental goal-directed activity whereas externals more often manifest emotional non-goal-directed responses. It is a priori that one outcome of fewer goal-directed responses by externals is relatively low achievement.
It has been demonstrated that the academic achievement of external students is typically less than that of internal students. Lefcourt, reviewing the locus of control literature, found that most studies reported "a positive association between internality and achievement behavior, and do so despite a wide range of measuring devices for the locus of control" (1, p. 18). It has also been demonstrated that externals lack persistence and are less likely to attribute their performance outcome to their own effort (or lack of effort).

Major efforts (programmed instruction, student contracting, etc.) have been directed at increasing student motivation based on the assumption that increased motivation increases effort. It may seem reasonable to conclude that students who do not try to improve their achievement are not motivated to do so. However, one may as reasonably entertain the view that some students (i.e. those of external control) are motivated but do not try; they do not try because they feel relatively powerless to effect their academic outcomes by their own efforts.

The basic assumption of the present experiment is that external control expectancies are maintained by their own consequences such as apathy and inactivity. This lack of involved struggle in attempting to change an event deprives an individual of the experiences which may be a prerequisite to success as a change agent. It is suggested that one of
the major drawbacks of a lack of such involvement is that
the external control student is less aware of the cues which
could inform him of the probability for success experiences.

Statement of the Problem

Indeed, the problem of increasing goal-striving and
achievement behavior in external control individuals has
been given some previous investigation. Though specific
achievement behavior of externals has been successfully
promoted by protracted training, generalization to other
achievement tasks has not been investigated. Also, the
effect on internals of a procedure designed to enhance the
achievement of externals has not been examined. The present
study was one designed to test the efficacy of a brief
training technique intended to alter temporarily the achieve-
ment outcomes of externally controlled students. This study
also examined whether the effects of such a technique trans-
ferred to a second, dissimilar task.

The experimental procedure sought to influence the
subjects' performance by two means. The procedure focused
the subjects' attention upon cues which emphasized effort
as instrumental in success and failure trials. In addition,
the experimenter provided verbal cues which interpreted the
subjects' performance as relevant to effort. Specifically,
the purpose of this study was to determine whether a brief,
persistence-inducing procedure was effective in improving
the performance of externally controlled students on tasks both similar and dissimilar to that of persistence training.

Definitions

1. **Internal-external locus of control** "refers to the extent to which persons perceive contingency relationships between their actions and their outcomes" (6). It was operationally defined as the score attained on the Intellectual Achievement Responsibility Questionnaire (IARQ) for purposes of this study. The IARQ is presented in Appendix A.

2. **Internal locus of control** was the score of those forty-five students in the two target grades who attained the highest total I score (internal or self-responsibility score) on the IARQ.

3. **External locus of control** was the score of those forty-five students in the two target grades who attained the lowest total I score on the IARQ.

4. **Persistence training** was three cue-discrimination problems containing twenty-four trials; each problem utilized a different pair of lettered stimuli.

5. **Similar task measure** was the total number of correct trials of two cue-discrimination problems containing twenty-four trials each. These problems used pairs of numbered stimuli and presented a possible total score of forty-eight correct responses.
6. **Dissimilar task measure** was the total number of correct associations on five trials of a five-item list of paired associates. There were twenty-five possible correct associations.

7. **Pretested training** was two cue-discrimination problems containing twenty-four trials each; each problem utilized a different pair of lettered stimuli of the type employed in persistence training.

**Hypotheses**

In general it was hypothesized that both main efforts (training and locus of control) would be significant. It was also expected that while internals would outperform externals in the control condition, the training procedures would act differentially on external and internal groups. Consequently, the external group's performance would be so enhanced as to bring them up to the level of the internal's performance.

To carry out the purpose of this study the following research hypotheses were tested:

1. The mean of the students in the persistence training group would be significantly greater than the mean of the students in the control group on the similar and dissimilar task measures.

2. The mean of the students in the pretested persistence training group would be significantly greater than the mean
of the students in the control group on the similar and dis-
similar task measures.

3. The mean of the students in the pretested persistence
training group would be significantly greater than the mean
of the students in the persistence training group on the
similar and dissimilar task measures.

4. The mean of the students in the internal groups
would be significantly greater than the mean of the students
in the external groups on the similar and dissimilar task
measures.

5. The mean of the students in the internal control
group would be significantly greater than the mean of the students
in the external control group on the similar and dissimilar task
measures.

6. There would be no significant difference between the
means of the students in the external and internal experi-
mental groups on the similar and dissimilar task measures.

Procedures for Collecting and Analyzing Data

Subjects were selected from among those 140 fourth- and
fifth-grade elementary school students at a target private
school. Students at this school are selected by competitive
admission on the basis of scores on I.Q. and academic achieve-
ment measures. They are generally from white, upper-middle-
class families. Those forty-five scoring most internal and
those forty-five scoring most external on the Intellectual
Achievement Responsibility Questionnaire represented the internal and external groups respectively. The IARQ is a published instrument which contains thirty-four items (see Appendix A). Scores are given in terms of total internality.

These subjects were then randomly assigned to one of three treatment conditions: control, persistence training, or pretested persistence training. The control group was given pretested training; the persistence training group was given its similar, more extensive training; and the pretested persistence training group was both pretested and given persistence training. All groups received the two consecutive dependent variables immediately following pretesting and training procedures.

The effects of brief persistence training were assessed by two variables. The first dependent variable required performance quite similar to the performance required in the previous training. A second dependent variable was operationally quite dissimilar to the previous training and test. It was used to measure the degree to which the previous training might generalize to an unrelated task.

It was expected that both persistence training and pretested persistence training would have a significant effect on the task performance of both externals and internals, though internals were expected to do better than externals in the control condition. However, in the experimental training conditions, externals were hypothesized to perform comparably
to internals by showing greater gains than internals. In short, while internals were generally expected to outperform externals on the dependent variables, it was hypothesized that the special training would serve to improve significantly the usually attenuated performance of the external students. This improvement effect was expected to be greater for externals than internals such that there would be no significant difference between the two groups. It was further hypothesized that these relationships would be consistent across both similar and dissimilar tasks, supporting the generalizability of the main treatment effect.
CHAPTER BIBLIOGRAPHY


CHAPTER II

REVIEW OF THE LITERATURE

A review of the relevant literature pertaining to this investigation is presented in four sections: (1) social learning theory and locus of control, (2) research related to some general descriptive correlates of externally and internally controlled populations, (3) research related to achievement and locus of control, and (4) research related to task performance interactions of locus of control.

Social Learning Theory and Locus of Control

Social learning theory holds that most personality traits are the result of learning—particularly the kind of learning that takes place in interaction with other people, i.e. within a social context. Personality is said to be largely concerned with habitual ways of responding to situations. These habits are learned in accordance with the standard principles of learning; they are learned responses to stimuli in the environment. Prominent among the originators of social learning theory are John Dollard, Neal Miller, J. B. Rotter, and more recently Albert Bandura and Richard Walters.

The locus of control construct derives from Rotter's social learning theory (39). Two of Rotter's students
developed scales for its measurement as an intrapersonal variable (19, 36). The construct was named "internal-external locus of control" (19).

Locus of control is an integral unit of an elaborated theory of social learning. In Rotter's social learning theory the potential for any behavior to occur in a given situation is a function of (1) that person's expectancy that the given behavior will secure the available reinforcement and (2) the value of the available reinforcement at that time (39). The locus of control construct is considered as a generalized expectancy, operating across a large number of situations. It concerns whether or not an individual perceives himself as one who possesses or lacks power over what happens to him. Internal control refers to the perception of positive and/or negative events as being a consequence of one's own actions and thereby under personal control; external control refers to the perception of positive and/or negative events as being related to one's own behaviors in certain situations and therefore beyond personal control.

There have been three major review articles investigating locus of control (23, 25, 40). Throop and MacDonald (42) have amassed a bibliography containing 339 locus of control articles through 1969 only. In addition, there have been at least three separate review articles studying specific aspects of locus of control (21, 23, 31). Lefcourt (25)
lists nine different tests of locus of control currently in use: Battle & Rotter (1); Bialen (3); Crandall, Katkovsky, and Crandall (7); Dean (10); Dies (12); Gozali and Bialer (16); Harrison (17); Nowicki and Strickland (34); and Rotter (40).

Some Descriptive Correlates of Locus of Control

Age

All humans begin life as a relatively helpless organism, dependent upon others for their reinforcement. Though an infant is not without power to promote an instrumental relationship between his behavior and his outcomes (e.g. crying may bring a feeding), it might be expected that as a child's range of behavior increases so might his perception of himself as an active agent of change. It would be an a priori assumption that individuals grow increasingly internal as a function of age.

Age change alone has been found to influence locus of control scores, older children being more internal than younger children (35). However, Crandall, Katkovsky, and Crandall (7), using their IARQ measure, found only a general tendency for internality to increase with age. They found no significant change in internality from third grade to fifth grade or from sixth grade to twelfth grade. Using their own locus of control scale for children, Nowicki and Strickland (34) found that the students in their sample became more internal with age.
Overall, it might be concluded that there is a general tendency for internality to increase with age. However, the paucity of longitudinal studies precludes a more definitive statement regarding the relationship between locus of control and age.

**Sex**

Generally, girls tend to score somewhat more internally on locus of control measures. In the standardization sample of the IARQ, females scored higher in internality in every grade sampled, though the difference reached significance (.05) only for those above the fifth-grade level (7). Considering all grades sampled, however, there were no significant sex differences. Similarly, Solomon, et. al., (41) found that older girls scored higher than older boys on the IARQ internality scale; there were no significant sex differences among younger students on the questionnaire. Nowicki and Strickland (34) developed another measure of children's locus of control; their scale samples a broad range of outcomes in addition to the academic-related situations questioned on the IARQ. They found only a general tendency for girls to score more internally in their standardization sample.

To summarize, there appears to be some general tendency for girls to score more internally than boys, especially older girls compared to older boys. However, it must be
concluded that there is no consistently demonstrable sex difference regarding locus of control when considering all grades combined.

**Intelligence**

Intelligence appears to be related to locus of control only as a general tendency rather than as a consistently significant difference. Four studies reported intelligence to be moderately related to perceived internal control (2, 3, 7, 8). However, additional research evidence suggests that the relationship between intelligence and locus of control is a complex one. On studies where the range of intelligence is not as broad (Bialer used retardates in his study), little relationship has been found. It is also apparent that locus of control is not simply a secondary response to one's own intelligence. For example, Nowicki and Roundtree (33) found that intelligence, as measured by the Otis Test of Mental Abilities, was not significantly related to locus of control for males or females. Further, Battle and Rotter (1) reported an inverse relationship between internality and intelligence; highly intelligent lower class Negroes were less internal (more external) than less intelligent middle class whites.

**Ordinal Position**

The belief that first-born children accept more self-responsibility than do those born later is predictable from
many personality theories. Chance (5) found a weak tendency for the earlier-born child to be somewhat more internal than later-born children. This finding was also reported by Crandall, et al., (7) who interpreted this result favoring first-born children to be a reflection of the likelihood that the first born are often given more responsibilities in their families, whereas the later born are more often in the position of being helped. MacDonald (30), restricting his sample to families of one or two children, found later-born children tending to be more external than first-born children; they were significantly more external than only children. Reporting some opposing results, Eisenman and Platt (15) found higher externality among first-born males. Nonetheless, there seems to be a general tendency for externals to be later born; however, the results have been of small magnitude and account for little of the overall variance.

Summary of General Correlates

Locus of control does not seem to vary in a simple unidimensional way upon the variables of age, sex, intelligence, or birth order. Though some studies report "moderate relationships" or a "general tendency", few report statistical significance. It is reasonable to conclude that though each of these variables accounts for some of the variance attributed to locus of control, none (with the
possible exception of age) are consistently significant beyond rather specific conditions. There are, then, a number of complicating variables to consider, including age, sex, intelligence, and birth order, when investigating a generalized expectancy of reinforcement with children.

Achievement and Locus of Control

As a logical extension of the concept of locus of control, Rotter (40) hypothesized that internals would engage in more overt striving for achievement than externals who may feel that they have little control over their rewards and punishments. Indeed, several earlier studies have shown that internals tend to spend more time in intellectual activities, exhibit more intense interest in academic pursuits, and score higher on academic tests than do externals (5, 7, 8). Lessing (29) reported that a sense of personal control predicted grade-point averages of students even when I.Q. scores were partialled out.

The report by Coleman (6) found that an internal locus of control generally accompanies various aspects of children's successful academic achievement. Using almost half a million subjects, the study found that a belief in destiny was a major determinant in school achievement. It was concluded that this pupil attitude factor had a stronger relationship to achievement than all other school factors together.
One exception to the rule favoring internality was reported by Katz (22) who found little relationship between achievement scores and scores on the IARQ among Negro children. However, the overwhelming majority of studies do report a positive association between internality and achievement behavior, and do so despite a wide range of measuring devices for the locus of control (25).

There is some evidence to suggest that locus of control has a differential effect on the achievement behavior of boys and girls. Crandall, et. al. (8) found IARQ scores significantly related to the amount of time boys chose to spend in intellectual activities during free play and the intensity with which they were striving in these activities. The correlations between these measures and internality were not significant for girls. Crandall, et. al. (7) concluded that the IARQ predicts differentially for the two sexes at different age levels. It has predicted best to the standardized achievement test performances of younger girls (below sixth grade) and to those of older boys. It has predicted better to activities in free play of young boys than to those of young girls. It was found that the most consistent prediction was to report card grades. Female achievement does not seem to be predictable from scores on the Nowicki-Strickland Scale (34). Only fifth- and seventh-grade girls showed a trend toward a relationship with achievement scores. The relationship between this
locus of control measure and achievement was much more frequently significant with males across grades.

Chance (5), in contrast, found that the IARQ was related to several school achievement criteria among both boys and girls in his sample. Correlations with reading skills, arithmetic performance, and with spelling test performance were all significant (.01) for both sexes.

In summary, most evidence suggests that internals tend to manifest greater interest and effort in achievement related activities than do externals. However, the predictions are not consistent for both boys and girls across studies using different ages, races, measures of achievement and locus of control scales.

Task Performance Interactions

One area related to achievement behavior has been investigated in some depth, the response of internals and externals to some differing task characteristics. It is reasonable to assume that if a person were too easily satisfied with successes or too responsive to failures, the likelihood of engaging in persistent behavior and continued achievement would be minimal. Persistence would seem to require a more measured response to the outcomes of achievement striving which would reflect a sensitivity to and change as a result of continued task experience, without an overresponse leading to the termination of effort (25).
Phares (36) reported the first study of task structuring of control from a social learning framework. He gave one group of subjects instructions which emphasized that success on a task (color or length-of-line matching) was due to skill. Another group was given instructions which emphasized that success on the same task was due to chance. Subjects with skill directions changed expectancies more frequently and more in the direction of previous experience. It was concluded that categorizing a situation as skill leads the subject to use the results of his past performance in formulating expectancies for future performances. Subsequent investigations (4, 20, 37) generally have supported this conclusion.

James (19) was an earlier investigator who studied the effect of skill and chance directions upon the expectancies of internal and external subjects. Externals were found to behave similarly to subjects who had received chance directions, exhibiting a more random response pattern which reflected less modification by the experience of success or failure. In this and similar studies, external subjects seemed to raise their expectancies after a failure to accomplish easier tasks (1, 26). This has been interpreted as a withdrawal of persistence or achievement challenge by externals who seem to fear failure more than hope for success (10, 32).
In general, the research indicates that internals seem to adjust their behavior more appropriately to their accumulating experiences than do externals. However, when the task seems to be more chance than skill determined, externals exhibit more experience-contingent expectancies and persistence, whereas internals seem to become more random. Internals seem to be more adaptive in their responses to success and failure than externals.

In explaining a differential response to success and failure, Lefcourt (25) suggested that the internal may dwell less upon his deficits by forgetting them, and perhaps becoming inattentive to cues relating to them, as he assumes an active stance toward his problems. The external, on the other hand, who has repeatedly described himself as being more anxious, maladjusted, and neurotic than internals, would be more likely to be ruminative about his failures which might, in turn, help to maintain his own self-perception as an inactive pawn of fate (38, 18).

Most of the research to date has been concerned with demonstrating the utility of the locus of control construct. Investigators have focused on predicted group differences or responses to tasks described as more or less controllable. Lefcourt and Ladwig (27) were responsible for the first study which focused on attempts to alter external control related behavior. It was concluded that behavior on the part of externals could be altered if new goals could be
cognitively linked (generalized) to whatever prior successes they may have had; consequently, they would behave with greater persistence in making at least some effort toward accomplishing the new goal. Lefcourt (24) reported a second, related study in which he successfully altered the performance of externals by cue-explicating directions. Internals produced fewer failure-avoidant patterns than externals when instructions were vague in regard to achievement. As the directions became more achievement-oriented, however, significantly fewer externals showed abnormal amounts of random responses and failure-avoidant patterns than other externals who had received nonachievement-stressing instructions.

In summary, externals seem to maintain an expectancy regarding skill-determined tasks which prevent their maximizing response feedback and often results in failure-avoidance behavior; externals show significantly less response persistence on skill-related tasks (43). A major problem of increasing goal-striving behavior in people maintaining external control expectancies lies in helping them become aware of the availability of reinforcements and of the methods of maximizing their chances of succeeding in given tasks. The underachievement of externals, however, has been somewhat modified by at least two techniques: (1) task generalizing to prior successes (27) and (2) cue-explication (24).
DeCharms (11) reported a "personal causation training" design to influence the "Origin-Pawn" variable in the school classroom. The Origin-Pawn variable is conceptually related to internal-external locus of control. Black elementary school teachers received personal causation training and designed and implemented classroom exercises for their sixth- and seventh-grade classes. Results of this experiment reported increased motivation of teachers and students, enhanced academic achievement of students and students' perceptions of being treated as Origins. The Origin-Pawn variable was found to mediate between personal causation and academic achievement.

Some recent research has suggested an additional technique whereby the inappropriate response shifting of externals to success and failure trials may be productively modified to enhance persistence. Dweck and Repucci (14) have shown that two children may receive exactly the same number and sequence of success and failure trials yet react quite differently as a function of whether they interpret the failure to mean that the situation is within or beyond their control. Dweck (13) subsequently undertook an investigation to determine whether altering attributions for failure would enable externally controlled children to deal more effectively with failure in an environmental, problem-solving situation. It was found that a "success" only treatment, which avoided failure and other negative
events, did not increase the persistence of the children. However, a treatment which involved not only success but also failure and "attribution retraining" (e.g. "that answer is wrong--you did not try hard enough") effectively overcame a lack of persistence. This treatment produced a more persistent performance on the experimental task which followed pretest training. It was concluded that external children's performance improved because the dependence of failure upon his responses was demonstrated to the child.

Dweck's selected subjects (those judged most "helpless") scored significantly (p<.005) more external on an IARQ. They were given twenty-five daily training sessions with arithmetic problems and tested with similar problems. No direct measures of transfer of training effects were taken; however, she stated that verbal reports from the teachers (who did not know which subject received which treatment) indicated that the subjects in the Attribution Retraining Treatment had begun to work harder, evidencing increased persistence with new material. Dweck suggested that external children's performance improved because the dependence of failure upon his responses was demonstrated to the child. She recommended that an instructional program for external children should capitalize upon errors as vehicles for teaching the child how to handle failure.
Summary

Locus of control is an integral unit of social learning theory. Those who perceive a contingency relationship between their outcomes and their behavior are called internals with respect to locus of control. Those who do not are called externals. This personality dimension has been given frequent attention in the recent literature.

Several variables show at least a trend toward significance with locus of control. Being older, being first born or female, and being more intelligent are more frequently associated with an internal locus of control. Conversely, there is evidence to suggest that being later born, younger, male or less intelligent is more frequently associated with an external locus of control. However, in general, the locus of control construct has proven to have a multidimensional nature which has not consistently related to any of these variables in a simple, linear way.

Almost all the research, however, points to the same conclusion: people with external locus of control orientations are disadvantaged relative to internals. One such handicap of externals is lower academic achievement. Internals tend to manifest greater interest and persistence in achievement related activities than do externals. Externals do not usually optimize their success-failure feedback in skill-related tasks. There have been few investigations concerned with techniques which might improve the
achievement of externals. Investigators working with adult subjects have used cue-explication and generalization to previous successes as techniques which enhance the achievement of externals. Attribution training and personal causation training have been effective with external students. These later training methods, however, were carried out over many days. It would seem that a much more contracted training period (as in the work with adult subjects) which combines several aspects of these methods might also enhance the achievement of externals.
CHAPTER BIBLIOGRAPHY


CHAPTER III

METHODS AND PROCEDURES

Selection of Subjects

Permission was obtained from a north central Texas school to use all fourth- and fifth-grade students in this investigation. Students admitted to this highly selective private school are predominantly white and upper-middle class. They are unusually bright and academically advanced. The mean Otis Test of Mental Abilities score for the subjects in this investigation was 123. Most students were one or more grade levels above their grade placement on the Stanford Achievement Test. Both I.Q. and achievement of all students are assessed routinely for use in the very competitive school admissions procedure.

All fourth- and fifth-grade students were given the Intellectual Achievement Responsibility Questionnaire (IARQ). As there were only 140 students in these grades, both grades were included to provide enough potential subjects for this study. Those forty-five students who scored most external in locus of control (externals) and those forty-five scoring most internal in locus of control (internals) were selected to represent the external and internal groups respectively. A total of ninety subjects was thereby selected.
Description of the Instrument

The Intellectual Achievement Responsibility Questionnaire (IARQ) taps a belief in one's own control over, and responsibility for, intellectual-academic successes and failures (3). The IARQ is composed of thirty-four forced-choice items. Each item stem is followed by one alternative stating that the event was caused by the student and another stating the event occurred because of the behavior of someone else in the student's environment. One-half of the items measure the student's acceptance of responsibility for positive events, the other half deals with negative events. In addition to a total score of internality of self-responsibility, separate subscores can be obtained for beliefs in intellectual responsibilities for successes and failures.

Following a rather favorable review, MacDonald stated: "The IARQ is a carefully developed scale that shows acceptable reliability and evidence of divergent and convergent validity" (6, p. 195). Crandall, et. al. (3) reported a test-retest reliability (two-month interval) of $r = .69$ on a sample of third- through fifth-grade elementary school children. Ninth-grade students were retested after a two-month interval and a $.65$ reliability coefficient was obtained. Internal consistency in the same study was assessed by split-half reliability estimate corrected by the Spearman-Brown Prophesy Formula. The correlations were $.54$ for positive event (success) items and
.57 for negative event (failure) items. It is apparent, then, that the items within each subscale are heterogenous.

In terms of validity, IARQ scores were significantly related to report card grades. Those with higher IARQ scores had higher report card averages. On the same sample high internal subjects of both sexes had significantly higher achievement test scores (Iowa Test of Basic Skills and the California Achievement Test) than low internal subjects on all subtest achievement scores and total achievement scores. Also, internality was associated with the amount of time boys chose to spend in intellectual activities during free play ($r = .70$) and the intensity with which they were striving in these activities ($r = .66$); these relations were not significant for girls (3). Correlations with intelligence test scores in the Crandall, Katkovsky, and Crandall (3) sample were found to be only moderate but reached significance due to the large samples employed. The California Test of Mental Maturity and the Lorge-Thorndike were used to generate a correlation of .26 for the total scale.

Procedure

The forty-five subjects in each group (external and internal) were randomly assigned to one of three treatment conditions: control, persistence training, and pretest training persistence training. Experimenter bias effects were largely controlled by a double-blind procedure. Neither
subject nor experimenter knew to which locus of control group (internal or external) each student had been assigned. The experimenter knew only to which treatment condition each subject belonged. Scoring of the IARQ and random group assignments were done independently by an assistant who had no knowledge of the hypotheses of the study.

The **Persistence Training Task** and **Similar Task Measure** used in this study were adapted entirely from the procedure used by Ingalls and Dickerson (5) to test hypothesis concept identification. It was selected for use in the present study because it was a task which almost assured both success ("correct") and failure ("wrong") trials. Persistence would very likely be rewarded. Also, thirty-seven out of forty fifth-grade middle-class students in the above study were able to master the task. It was expected that almost all of the students in the present study would likewise perform successfully. The verbal attributions by the experimenter to the subjects' effort (or lack of effort) in the persistence training were adapted from Dweck's (3) study.

**Persistence Training Condition**

Each subject in the persistence training only condition was individually presented with a series of three cue-discrimination problems as his initial task. The same three problems were presented in the same order to all those subjects. The stimuli in each problem differed along four
binary dimensions (size, color, letter or shape, and position) and were drawn 2\frac{1}{2} inches apart on plain 3 x 5 inch cards. Figure 1 shows an example of a cue-discrimination problem card which contains these four binary dimensions. The large letter was 5/8 inch in height and the small letter was 3/8 inch in height. Different problems used different pairs of letters and colors.

![Fig. 1—A cue discrimination problem card which contains the binary dimensions of size, color, letter, and position.](image)

A preliminary instruction and training period preceded the experimental problems. The students were shown a sample stimulus card and then received the following instructions:

In this experiment, you will be given several problems. Each problem consists of a series of cards like this one. Each card will always contain two letters and the letters will be of
two colors. You will also notice that the letters are of two different sizes and that one is on the left and one is on the right. Only one of the things about the card is right because it matches what I have written on my sheet. For each card I want you to point to the design that you think has the correct thing about it. I will tell you whether you are right or wrong. Then you go on to the next card, again make a choice, and again I will tell you whether you guessed correctly. In this way you can learn what thing about the card is correct. On each problem the correct answer will be determined by only one of the four things. You can figure out whether it is because of the size, the color, the letter, or the position. The object is for you to figure this out as fast as possible so that you can choose correctly as often as possible. Any questions? Let's try this one. Point to which one has the correct thing about it.

The subject then received a deck of twenty-four cards face up. He responded to the stimulus of his choice by pointing; he was told "correct" or "wrong" and the next card was presented. After the eighth trial the experimenter asked the subject whether he knew the solution. If he did (e.g. blue), he was told, "Good, you really stuck with it and got that just right." This attribution followed all correct problem solutions. If the subject was unable to give the correct solution, the experimenter said, "Okay, why don't you try a few more? Try real hard this time. Remember, one of the colors, one of the sizes, one of the letters, or one of the positions is always correct." The subjects then received another eight trials and were again asked for the solution. If still incorrect, the experimenter said, "On this problem the blue letter (or other
correct response) is always correct. Let's see if you can get all the rest right." The subjects then received an additional eight trials on Problem One and then moved on to Problem Two. All subjects were retained without regard for their performance on persistence training.

Pretested Persistence Training Condition

Each subject in the pretested persistence training condition received two cue-discrimination problems immediately prior to the persistence training described above. They had the same instructions but were given two problems containing letters different from those letters used in persistence training. In this pretest training condition, subjects were not asked if they knew the solution after eight trials as in the procedure to follow; also, they were given no verbal attributions by the experimenter, only right or wrong statements. The experimenter maintained a separate score sheet for each pretested subject on which his correct responses were cumulatively recorded.

Control Condition

Control group subjects received only pretested training prior to the administration of the two dependent variables. The pretested training procedure was that given those subjects in the pretested persistence training condition. Control group subjects were given pretesting as a control procedure designed to neutralize the task familiarity
advantage of the experimental groups who had previously experienced persistence training. Pretesting was immediately prior to the administration of the similar task measure.

**Similar Task Measure**

Immediately following persistence training, subjects in the experimental treatment groups were given two additional cue-discrimination problems containing pairs of numbers rather than letters. They were given the following instructions: "I have two more problems similar to the last ones except that they have numbers instead of letters on the cards. Again, you are to guess the right thing about each card--size, color, number, or position." Control group subjects were given the similar task measure immediately following pretest training. They received the same instructions, described above, as those of the experimental subjects. They were given a score representing the total number of correct trials out of forty-eight possible correct answers. These scores were cumulatively recorded for each subject on a separate score sheet.

**Dissimilar Task Measure**

The dissimilar task measure was a paired-associate learning task which immediately followed the similar task measure. It was presented in a standard verbal learning format for paired-associate tasks. The task consisted of five consonant-vowel-consonant:digit pairs. Figure 2 shows
an example of a paired-associate learning task card. The stimuli were low association trigrams taken from Archer (1).

Fig. 2--A paired-associate learning task card

The procedures were adapted from Aaumeister and Kistler (2) who tested second- and fifth-grade subjects. Materials were presented on plain 3 x 5 inch cards. The black letters and numbers were 3/8 inch in height, drawn two inches apart.

All subjects received the same randomized order of presentation preceded by the following instructions:

Next, I want you to do something different. First, let's read these nonsense words out loud. (Read) Now, please study this pair to learn the number that goes with the word. (Five seconds later) I will show you four more pairs with the words and different numbers. Try to remember which number goes with which word because I will test you afterwards to see how many of the correct numbers you can put with the correct word.
A self-paced familiarization trial, in which the subject pronounced the items, was conducted prior to paired-associate learning. The study-test method was employed. Each pair was presented for five seconds, followed by a five-second interim interval. After the presentation of the last pair, each stimulus term was presented alone for five seconds, followed by a five-second interval during which the subject responded. The intertrial interval was also five seconds. All subjects were given five trials of the five-item paired associate list. The list order was randomly presented on each trial prior to testing. Correct responses were cumulatively recorded on each subject's score sheet.

Training and testing of all subjects was done by the experimenter in the same private room at the school. Training and testing was done individually, alternating subjects from each of the three treatment conditions with respect to order tested.

Design of the Study

This study utilized a posttest only control group design. It was designed to test the effects of the three treatment conditions on external and internal controlled subjects. The design of the study showing the relationship between the treatment conditions of persistence training and the methodological procedures is presented diagrammatically in Table I.
TABLE I
THE RELATIONSHIP BETWEEN THE PERSISTENCE TRAINING TREATMENT CONDITIONS AND THE METHODOLOGICAL PROCEDURES

<table>
<thead>
<tr>
<th>Treatment Conditions</th>
<th>Procedures</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest Training</td>
<td>Persistence Training</td>
<td>Similar Task</td>
<td>Dissimilar Task</td>
</tr>
<tr>
<td>Control</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Persistence Only</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Pretested Persistence</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Treatment of the Data
To test the experimental hypotheses a two-way analyses of variance was utilized. The effects of the two independent variables (three treatment conditions and two locus of control positions) were measures by the two dependent variables (similar and dissimilar task measures).

The data analysis shown in treatment cells, with the number of subjects in each cell, is presented diagrammatically in Table II. The results were reported in terms of F-ratios and the .05 level of significance used in the testing of the hypotheses. The Newman-Keuls method of multiple comparison was used to test for interaction effects.
### TABLE II
TREATMENT OF THE DATA SHOWING TREATMENT CELLS AND THE NUMBER OF SUBJECTS IN EACH CELL

<table>
<thead>
<tr>
<th>Treatment Conditions</th>
<th>Locus of Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>External</td>
</tr>
<tr>
<td>Control</td>
<td>15</td>
</tr>
<tr>
<td>Persistence Only</td>
<td>15</td>
</tr>
<tr>
<td>Pretested Persistence</td>
<td>15</td>
</tr>
</tbody>
</table>

A subanalysis was performed in order to compare some descriptive characteristics of the internal-external samples in the current study. The descriptive variables of sex and birth order of the external and internal groups were compared by chi square analyses. Intelligence and age variables of the groups were compared by analysis of variance. The results were reported in terms of chi square and F-values and the .05 level of significance used.
CHAPTER BIBLIOGRAPHY


The purpose of this chapter is to present, analyze, and discuss the findings of this investigation. The data will be examined as they relate to each hypothesis. Other descriptive data will also be presented.

This study was designed to test the effectiveness of a brief, persistence-inducing procedure in improving the performance of externally controlled students on tasks both similar and dissimilar to the persistence training. A two-way analysis of variance was employed to determine whether the three treatment effects differed significantly on either of the two locus of control groups. The .05 level of significance was established as the criterion for accepting or rejecting the hypotheses. The hypotheses stated in Chapter I were converted to the null form for the statistical tests of significance.

Null hypothesis 1 predicts that the mean of the students in the persistence training group will not be significantly different than the mean of the students in the control group on the similar and dissimilar task measures. Null hypothesis 2 predicts that the mean of the students in the pretested persistence training group will not be significantly different
than the mean of the students in the control group on the similar and dissimilar task measures. Null hypothesis 3 predicts that there will be no significant difference between the means of the persistence training and the pretested persistence training groups on the similar and dissimilar measures.

Table III reflects the means and standard deviations of each treatment group on the similar task measure. The means are the number of correct trials (or forty-eight) on two cue-discrimination problems of twenty-four trials each.

**TABLE III**

**MEANS AND STANDARD DEVIATIONS OF THE SIMILAR TASK MEASURES**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Locus of Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>External</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>Persistence</td>
<td>41.0000</td>
</tr>
<tr>
<td>Pretested Persistence</td>
<td>42.7333</td>
</tr>
<tr>
<td>All Treatments</td>
<td>40.9778</td>
</tr>
</tbody>
</table>
Table IV presents the analysis of variance data related to these treatment and locus of control groups. The F-values reflected in Table IV did not attain the .05 level of significance. Hence, null hypotheses 1, 2, and 3 cannot be rejected with regard to the similar task measure.

**TABLE IV**

ANALYSIS OF VARIANCE DATA OBTAINED FOR THE SIMILAR TASK MEASURES

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F-Value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>266.8667</td>
<td>2</td>
<td>133.4333</td>
<td>2.9975</td>
<td>.0553</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>30.0444</td>
<td>1</td>
<td>30.0444</td>
<td>.6749</td>
<td>.4136</td>
</tr>
<tr>
<td>Interaction</td>
<td>73.4889</td>
<td>2</td>
<td>36.7444</td>
<td>.8255</td>
<td>.4416</td>
</tr>
<tr>
<td>Within Groups</td>
<td>3739.2000</td>
<td>84</td>
<td>44.5143</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total</td>
<td>4109.6000</td>
<td>89</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

The means and standard deviations of the dissimilar task measures are presented in Table V. The means are the total number of correct associations on five trials of a five-item list of paired associates. There were twenty-five possible correct associations.
**TABLE V**

MEANS AND STANDARD DEVIATIONS OF THE DISSIMILAR TASK MEASURE

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Locus of Control</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>External</td>
<td>Internal</td>
<td>All Subjects</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
</tr>
<tr>
<td>Control</td>
<td>15.8000</td>
<td>5.5188</td>
<td>15.4667</td>
<td>5.3701</td>
<td>15.6333</td>
</tr>
<tr>
<td>Persistence</td>
<td>18.7333</td>
<td>4.7580</td>
<td>16.2667</td>
<td>5.3914</td>
<td>17.5000</td>
</tr>
<tr>
<td>All Treatments</td>
<td>16.9778</td>
<td>5.6588</td>
<td>16.6222</td>
<td>5.8243</td>
<td>16.3000</td>
</tr>
</tbody>
</table>

Table VI presents the analysis of variance data obtained on the dissimilar task measure of the treatment and locus of control groups. The F-Values reflected in Table VI did not

**TABLE VI**

ANALYSIS OF VARIANCE OBTAINED ON THE DISSIMILAR TASK MEASURE

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F-Value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>65.0667</td>
<td>2</td>
<td>32.5333</td>
<td>0.9693</td>
<td>.3835</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>41.3444</td>
<td>1</td>
<td>41.3444</td>
<td>1.2318</td>
<td>.2702</td>
</tr>
<tr>
<td>Interaction</td>
<td>17.1556</td>
<td>2</td>
<td>8.5778</td>
<td>0.2556</td>
<td>.7751</td>
</tr>
<tr>
<td>Within Groups</td>
<td>2319.3333</td>
<td>84</td>
<td>33.5635</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total</td>
<td>2942.9000</td>
<td>89</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>
attain the .05 level of significance. Therefore, null hypotheses 1, 2, and 3 cannot be rejected with regard to the dissimilar task measures as well as the similar task measures.

Null hypothesis 4 predicts there will be no significant difference between the means of students in the locus of control groups on the similar and dissimilar task measure. The means and standard deviations of the locus of control groups for the similar and dissimilar task measures have been presented in Tables III and V respectively. The similar task F-value (.6749) for the locus of control groups, shown in Table IV, did not attain the .05 level of significance. Likewise, the dissimilar task F-Value (1.2318) for the locus of control groups, shown in Table VI, did not attain the .05 level of significance. Therefore, null hypothesis 4 cannot be rejected.

Null hypothesis 5 predicts that the mean of the students in the internal control group will not be significantly different than the mean of the students in the external control group on the similar and dissimilar task measures. Null hypothesis 6 predicts that there will be no significant difference between the means of the students in the external and internal experimental (persistence and pretested persistence) groups on the two task measures. The means and standard deviations of the similar task measure for each
treatment cell have been presented in Table III. The means and standard deviations of the dissimilar task measure for each treatment cell have been presented in Table V. Neither F-Value for the interaction source of variance in Tables IV and VI attained the .05 level of significance. Therefore, null hypotheses 5 and 6 cannot be rejected.

Additional data are reported here for the purpose of describing some characteristics of the external and internal locus of control groups. The mean age (in months) and standard deviations for the external and internal groups are reported in Table VII.

### TABLE VII

**MEAN AGE (IN MONTHS) AND STANDARD DEVIATIONS FOR THE INTERNAL AND EXTERNAL GROUPS**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Locus</td>
<td>117.7333</td>
<td>7.4693</td>
</tr>
<tr>
<td>Internal Locus</td>
<td>121.7555</td>
<td>6.5718</td>
</tr>
</tbody>
</table>

Analysis of variance data on the ages of the external and internal groups is reported in Table VIII. This F-Value indicates that the internal group is significantly (.01) older than the external group.
TABLE VIII

ANALYSIS OF VARIANCE DATA ON THE AGES OF THE EXTERNAL AND INTERNAL GROUPS

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Variance Estimate</th>
<th>F-Value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>354.0111</td>
<td>1</td>
<td>364.0111</td>
<td>7.3553</td>
<td>.0080</td>
</tr>
<tr>
<td>Within</td>
<td>4355.1111</td>
<td>88</td>
<td>49.4899</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total</td>
<td>4719.1222</td>
<td>89</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

The I.Q. of each subject was measured by the Otis Test of Mental Abilities, Elementary Level I, Form J. Means and standard deviations of the I.Q. of subjects in the external and internal groups are presented in Table IX.

TABLE IX

MEAN I.Q. AND STANDARD DEVIATIONS FOR THE EXTERNAL AND INTERNAL GROUPS

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Locus of Control</td>
<td>123.6444</td>
<td>13.8221</td>
</tr>
<tr>
<td>Internal Locus of Control</td>
<td>121.8222</td>
<td>11.9073</td>
</tr>
</tbody>
</table>
Analysis of variance data, reported in Table X, indicates no significant difference between the I.Q. scores of the students in the external and internal groups.

TABLE X
ANALYSIS OF VARIANCE DATA OBTAINED ON THE I.Q. SCORES OF THE STUDENTS IN THE EXTERNAL AND INTERNAL GROUPS

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Variance Estimate</th>
<th>F-Value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>74.7111</td>
<td>1</td>
<td>74.7111</td>
<td>0.4489</td>
<td>.5046</td>
</tr>
<tr>
<td>Within</td>
<td>14644.8889</td>
<td>88</td>
<td>166.4192</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Total</td>
<td>14719.6000</td>
<td>89</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

Also, chi square data, reported in Table XI, indicates no significant difference between the external and internal groups with regard to sex (male or female) and birth order.

TABLE XI
CHI SQUARE DATA REGARDING THE SEX AND BIRTH ORDER OF THE EXTERNAL AND INTERNAL SUBJECTS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Chi Square</th>
<th>df</th>
<th>Critical Value Required at .05 Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>1.6667</td>
<td>1</td>
<td>3.84</td>
</tr>
<tr>
<td>Birth Order</td>
<td>3.1255</td>
<td>4</td>
<td>9.49</td>
</tr>
</tbody>
</table>
Additional descriptive data regarding the total internality IARQ scores of the students tested in this investigation are presented in Table XII. These means, standard deviations, and ranges are comparable to those reported by Crandall, et. al. (7) in the standardization sample. Total internality scores for fourth-grade students were reported as 24.80 (mean), 3.37 (standard deviation), and 15-30 (range); for fifth-grade students the scores were 24.19 (mean), 3.83 (standard deviation), and 15-32 (range). In general, it seems that the students in this investigation answered the IARQ similarly to the subjects in the study done by Crandall, et. al. (7) with regard to total internality.

**TABLE XII**

MEANS, STANDARD DEVIATIONS, AND RANGES OF TOTAL INTERNALITY IARQ SCORES

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>S.D.</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Sample</td>
<td>20.31</td>
<td>3.03</td>
<td>12-24</td>
</tr>
<tr>
<td>Internal Sample</td>
<td>29.51</td>
<td>1.56</td>
<td>27-34</td>
</tr>
<tr>
<td>Total</td>
<td>25.14</td>
<td>4.21</td>
<td>12-34</td>
</tr>
</tbody>
</table>

**Discussion**

As expected, both persistence training and pretested persistence training had an enhancing effect ($p = .055$) on the similar task performance of both externals and internals.
However, these training procedures had no effect on the dissimilar task performance of either groups. Internals failed to do better than externals in the control condition; indeed, externals performed comparably to internals in all conditions, a result not anticipated by the hypotheses of the present study. Further, externals did as well as internals regardless of the task, attaining parity in both the similar and dissimilar measures.

Perhaps the most surprising finding of the present study was the apparent lack of relationship between locus of control and achievement on the two learning tasks. In a major review article it was concluded that the overwhelming majority of studies reported a positive association between internality and achievement behavior, despite a wide range of measuring devices for the locus of control (13). Chance (4) found that the IARQ was related (.01) to several school achievement criteria among both boys and girls, including reading skills, spelling test performance, and arithmetic performance. Crandall, et. al. (5) concluded that the IARQ predicts consistently to report card grades.

A methodological consideration of this study which might account for the comparable performance of externals and internals concerns the assumption of dichotomous groups. It might be argued that no differences were obtained between externals and internals because they were not significantly different from each other with regard to locus of control,
i.e. they were not dichotomous groups. Such an argument would predict that more extreme locus of control positions would have produced the expected divergent performance on the similar and dissimilar tasks.

The present study contains at least two task variations from the general literature which might account for findings which depart from the typical study. First, the achievement task measures (cue discrimination and paired-associate memory problems) are unusual school activities. Though such activities require skills which are also useful in the classroom, they might well be perceived as novel, outside of a student's usual set of school-related behavior. While the IARQ specifically measures academic achievement attitudes, exposure to such unusual school problems as cue discriminations and paired-associations might be perceived as relatively unrelated to academics. Therefore, it is possible that externals, who might do more poorly on standard academic achievement measures, perceive the learning tasks in a different context, i.e. one which allows them to respond adaptively and with persistence that usually is displayed by internals.

A second task variation concerns the response of internals and externals to chance versus skill-related tasks. In general, the research indicates that internals seem to adjust their behavior more appropriately to their accumulating experiences than do externals (13). However, when the task seems to be more chance than skill determined, externals
exhibit more experience-contingent performance, whereas internals seem to become more random (1, 9, 14, 18). The similar task measure of the present investigation begins as guessing (chance-determined) and becomes a function of learning (skill) as the trials continue. The outcome in which no performance differences occur might be partially a function of the task in which both chance and skill determination are utilized, i.e. externals may be initially better motivated by chance and, later, internals may be better motivated by the task's subsequent skill relatedness. The dissimilar task (paired-associate memory task) is entirely skill related; however, there was no advantage demonstrated by the internal group as might have been predicted.

An additional departure from the general literature concerns the special characteristics of these subjects in that they were students in a private school. All students were selected competitively for admission on the basis of standardized achievement and I.Q. tests. Such screening might necessarily admit only a specialized type of external control student, one with demonstrable academic competence in spite of an attitude which might reflect some indifference to an instrumental relationship between effort and academic achievement. Another possible explanation regarding the external subjects' high achievement would implicate their
unusually high I.Q. scores \((X = 122.73)\) as a more salient factor in predicting achievement than an unmotivated attitude (externality).

The relatively high socioeconomic status of these students was also a special consideration. The students used in earlier investigations which reported significance between achievement and locus of control were middle-class, public school students. However, in another study this relationship was not tenable for low socioeconomic black students (10). The current investigation likewise implicates culture and socioeconomic level as variables potentially relevant to a significant relationship between locus of control and achievement.

The lack of relatedness between locus of control and task performance is the most important finding of this investigation. That these externals performed comparably to internals provides some evidence that the locus of control construct is considerably less relevant to unusually bright students of higher economic and social status. The implication is that externality \textit{per se} is not necessarily a debilitating state with regard to achievement behavior.

Another major unexpected finding of the present study concerns the failure of the persistence conditions to generate improved performance on a dissimilar task. It must be concluded that brief persistence training is ineffective in providing generalizable training, training which transfers
a more persistent effort to a second task. Lefcour (11, 12), DeCharms (7), and Dweck (8) reported procedures which improved the achievement behavior of externals by a long-term training. Perhaps the brevity of the training in this study undercut any opportunity to significantly alter behavior. From a different perspective, however, it might be argued that the externals in this investigation (already achieving commensurate with internals) were already motivated and persistent with regard to achievement behavior.

The finding of significance in the relationship of older age and internality is consistent with most of the related literature. Crandall, et al. (5), Penk (17), and Nowicki and Strickland (16) generally reported increased internality with age.

Though some studies have reported a significant relationship between locus of control and intelligence (2, 4, 5, 12), the present study did not find a significant relationship. This result is compatible with that of Nowicki and Roundtree (15) who found no significant relationship between intelligence and locus of control for males or females. The present study, like Nowicki and Roundtree, used the Otis Test of Mental Ability as the measure of I.Q.

Likewise, no significant relationship was evidenced in the present study between birth order and locus of control. Crandall (5) reported a relationship between earlier birth order and internality. However, the Crandall investigation
did not find significance in the elementary school grades; rather, the first-born children in the upper grades only gave significantly more internal responses to the IARQ. Considering grade as well as birth order, then, the results of the present investigation are compatible with this earlier study.

The present investigation failed to demonstrate a significant relationship between sex and locus of control. This is congruent with the IARQ standardization data in which girls scored significantly more internally than boys in the upper grades (above the sixth grade) only (5).
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CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Locus of control has been described as an integral unit of social learning theory (12). Those who perceive a contingency relationship between their outcomes and their behavior are called internal with respect to locus of control. Those who do not are called external. This personality dimension has been given prolific attention in the recent literature (5, 6, 8, 10).

Several variables that are frequently associated with an internal locus of control are being older, being first-born or female, and being more intelligent (1, 8, 11, 12, 14). Conversely, there is evidence to suggest that being later born, younger, male, or less intelligent is more frequently associated with an external locus of control. In general, however, the locus of control construct has been proven to have a multidimensional nature which has not been found to be consistently related to any variable in a simple, linear way.

Generally, research results indicate that people with an external locus of control orientation are disadvantaged. One such finding is that externals typically have lower academic achievement (8, 10). Internals tend to manifest
greater interest and persistence in achievement-related activities than do externals. Externals do not usually optimize their success-failure feedback in skill-related tasks. There have been several investigations of training procedures for improving the achievement of externals. Investigators working with adult subjects have used cue-explication and generalization to previous successes as techniques to enhance the achievement of externals (7, 8). Attribution training and personal causation training have been effective in improving the academic achievement of external students (2, 3). These training methods, however, were carried out over a period of several months.

Although arithmetic achievement behavior of externals improved by protracted attribution training, the transfer of this training to other achievement tasks was not investigated (8). Also, the effect on internals of a training designed to enhance the achievement of externals has not been examined.

The present study was designed to test the efficacy of short-term persistence training. The purpose of the training was to alter temporarily the achievement outcomes of externally controlled students. This study also examined whether the effects of such a technique transferred to a second, dissimilar task.

Subjects were selected from among those 140 students comprising the fourth- and fifth-grades at a target private
school. Those forty-five students scoring most internal and those forty-five students scoring most external on a locus of control questionnaire represented the internal and external groups respectively. These subjects were then randomly assigned to one of three treatment conditions: control, persistence training, or pretested persistence training. The control group was given pretested training; the persistence training group was given its similar, more extensive training; and the pretested persistence training group received both treatments. Each group received the two dependent variable learning tasks (cue discrimination and paired associate) consecutively and immediately following the treatment procedures.

While internals were generally expected to outperform externals on the learning tasks, it was hypothesized that the special training would serve to improve significantly the usually attenuated performance of the external students. This improvement effect was expected to be greater for externals (who were expected to do more poorly initially) than internals; it was predicted that there would be no significant difference between the two groups after persistence training. It was further hypothesized that these relationships would be consistent across both similar and dissimilar tasks, supporting the generalizability of the persistence training.
It was found that the persistence training did not have a significantly enhancing effect on the similar task performance. Also, these training procedures had no significant effect upon the dissimilar task performance of either group. Internals failed to do better than externals, regardless of the type of persistence training or the task employed. Although the total internality IARQ scores of the students in this study were comparable to those of the standardized norm of Crandall, et. al. (5), the students did not perform as might has been expected.

This finding of unrelatedness between achievement and locus of control is not supported in the reported literature (5, 8, 10). Two explanations for these results are suggested: (1) task differences and (2) subject differences. First, it was noted that the cue discrimination and paired-associate tasks used may not have been immediately associated and perceived as usual academic achievement tasks by these fourth- and fifth-grade students. If perceived as nonacademic tasks, the externals may have employed a more adaptive cognitive set, similar to that typically utilized by internals, i.e. higher motivation arising from a sense of relatedness between one's outcome and one's effort.

Perhaps a more parsimonious explanation for the comparable performance of externals and internals lies in the stringent admission and continuance policy of the private school from which these subjects were drawn. All students
were selected competitively on the basis of standardized achievement and I.Q. tests. Such screening would admit only a special type of student, one with demonstrable academic competence in spite of an attitude which might reflect some indifference to effort as a means of achieving outcomes. A second possible explanation regarding the external subjects' higher achievement is that their unusually high intelligence test scores might override and compensate for a less than optimal attitude (externality) regarding achievement.

The lack of relatedness between locus of control and performance on these learning tasks is perhaps the most salient finding of this investigation. The external students simply did not perform more poorly than the internal students as one might predict following a review of the literature. In the case of these students and these tasks, an external locus of control is not at all predictive of performance. It would seem that the most likely explanation lies in the special nature of the students in this sample.

The sample students are enrolled in a private school; their parents (typically white and upper-middle or lower-upper class) pay approximately $1500.00 per year tuition. The students are enrolled following highly selective admissions testing. There is an implication that externality per se is not necessarily a debilitating state with regard to achievement; the externals in this sample were highly competent performers on the learning tasks administered.
Because persistence training failed to enhance the students' performance on a dissimilar task, it was concluded that brief persistence training was ineffective in increasing the students' performance in a dissimilar paired-associate task. Previously reported successes in the literature utilized an extended training period. It might be argued that persistence training could not be evaluated in the current context because externals demonstrated no performance decrement with regard to internals; they appeared to be already motivated and as persistent as internals in the achievement behavior measured. In other words, external students' initial performance was not attenuated as predicted and, therefore, more improvement of performance relative to internals was not applicable.

Recommendations

On the basis of the findings of this investigation, the following recommendations are made:

1. Persistence training is potentially more significant if carried out over several months. The question of how long a period is necessary remains for further research.

2. Persistence training may be more accurately assessed by restricting the sample and comparisons to externals only, including an untested control group.

3. Future research concerning techniques for the enhancement of achievement behavior in externals would be more
useful if particular consideration was given to the subject characteristics of I.Q. and academic achievement. A comparison of the performance of bright, high achieving externals with average externals might more clearly elucidate the function of these subject characteristics.

4. The task parameters of academic vs. nonacademic and chance vs. skill directions are areas which deserve ongoing consideration in future research.

Conclusions

The following conclusions are presented as a result of this study:

1. As used in this study the persistence training procedures were not effective in the enhancement of performance on a cue discrimination task. It was not effective on a dissimilar task.

2. Externals consistently performed as well as internals on both similar and dissimilar tasks regardless of the treatment employed. It was concluded that the external subjects and/or tasks used represent special situations in their lack of a demonstrable relationship between locus of control and achievement behavior. An implication is that an external locus of control does not preclude academic success for bright students.

3. Age was significantly related to locus of control with older students being more internal. Birth order, sex,
and intelligence were not significantly related to locus of control. These results were consistent with most reported in the literature.
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NAME: ______________________  BIRTHDATE: ______________________

SEX: BOY  _____  GIRL  _____  AGE: ______________________

How many children are there in your family?  ______________________

Were you born:  First  __  Second  __  Third  __  Fourth  __  Fifth  __

1. If a teacher passes you to the next grade, would it probably be
   ____  a. because she liked you, or
   ____  b. because of the work you did?

2. When you do well on a test at school, is it more likely to be
   ____  a. because you studied for it, or
   ____  b. because the test was especially easy?

3. When you have trouble understanding something in school, is it usually
   ____  a. because the teacher didn't explain it clearly, or
   ____  b. because you didn't listen carefully?

4. When you read a story and can't remember much of it, is it usually
   ____  a. because the story wasn't well written, or
   ____  b. because you weren't interested in the story?

5. Suppose your parents say you are doing well in school. Is this likely to happen
   ____  a. because your school work is good, or
   ____  b. because they are in a good mood?

6. Suppose you did better than usual in a subject at school. Would it probably happen
   ____  a. because you tried harder, or
7. When you lose at a game of cards or checkers, does it usually happen
   ____ a. because the other player is good at the game, or
   ____ b. because you don't play well?

8. Suppose a person doesn't think you are very bright or clever.
   ____ a. Can you make him change his mind if you try, or
   ____ b. are there some people who will think you're not very bright no matter what you do?

9. If you solve a puzzle quickly, is it
   ____ a. because it wasn't a very hard puzzle, or
   ____ b. because you worked on it carefully?

10. If a boy or girl tells you that you are dumb, is it more likely that they say that
    ____ a. because they are mad at you, or
    ____ b. because what you did really wasn't very bright?

11. Suppose you study to become a teacher, scientist, or doctor and you fail. Do you think this would happen
    ____ a. because you didn't work hard enough, or
    ____ b. because you needed some help, and other people didn't give it to you?

12. When you learn something quickly in school, is it usually
    ____ a. because you paid close attention, or
    ____ b. because the teacher explained it clearly?
13. If a teacher says to you "Your work is fine," is it
   _____ a. something teachers usually say to encourage pupils, or
   _____ b. because you did a good job?

14. When you find it hard to work arithmetic or math problems at school, is it
   _____ a. because you didn't study well enough before you tried them, or
   _____ b. because the teacher gave problems that were too hard?

15. When you forget something you heard in class, is it
   _____ a. because the teacher didn't explain it very well, or
   _____ b. because you didn't try very hard to remember?

16. Suppose you weren't sure about the answer to a question your teacher asked you, but your answer turned out to be right. Is it likely to happen
   _____ a. because she wasn't as particular as usual, or
   _____ b. because you gave the best answer you could think of?

17. When you read a story and remember most of it, is it usually
   _____ a. because you were interested in the story, or
   _____ b. because the story was well written?

18. If your parents tell you you're acting silly and not thinking clearly, is it more likely to be
   _____ a. because of something you did, or
   _____ b. because they happen to be feeling cranky?

19. When you don't do well on a test at school, is it
   _____ a. because the test was especially hard, or
   _____ b. because you didn't study for it?
20. When you win at a game of cards or checkers, does it happen
   ___ a. because you play real well, or
   ___ b. because the other person doesn't play well?

21. If people think you're bright or clever, is it
   ___ a. because they happen to like you, or
   ___ b. because you usually act that way?

22. If a teacher didn't pass you to the next grade, would it probably be
   ___ a. because she "had it in for you," or
   ___ b. because your school work wasn't good enough?

23. Suppose you don't do as well as usual in a subject at school. Would this probably happen
   ___ a. because you weren't as careful as usual, or
   ___ b. because somebody bothered you and kept you from working?

24. If a boy or girl tells you that you are bright, is it usually
   ___ a. because you thought up a good idea, or
   ___ b. because they like you?

25. Suppose you became a famous teacher, scientist or doctor. Do you think this would happen
   ___ a. because other people helped you when you needed it, or
   ___ b. because you worked very hard?

26. Suppose your parents say you aren't doing well in your school work. Is this likely to happen more
   ___ a. because your work isn't very good, or
   ___ b. because they are feeling cranky?
27. Suppose you are showing a friend how to play a game and he has trouble with it. Would this happen
   ______ a. because he wasn't able to understand how to play, or
   ______ b. because you couldn't explain it well?

28. When you find it easy to work arithmetic or math problems at school, is it usually
   ______ a. because the teacher gave you especially easy problems, or
   ______ b. because you studied your book well before you tried them?

29. When you remember something you heard in class, is it usually
   ______ a. because you tried hard to remember, or
   ______ b. because the teacher explained it well?

30. If you can't work a puzzle, is it more likely to happen
   ______ a. because you are not especially good at working puzzles, or
   ______ b. because the instructions weren't written clearly enough?

31. If your parents tell you that you are bright or clever, is it more likely
   ______ a. because they are feeling good, or
   ______ b. because of something you did?

32. Suppose you are explaining how to play a game to a friend and he learns quickly. Would that happen more often
   ______ a. because you explained it well, or
   ______ b. because he was able to understand it?

33. Suppose you're not sure about the answer to a question your teacher asks you and the answer you give turns out to be wrong. Is it likely to happen
   ______ a. because she was more particular than usual, or
34. If a teacher says to you, "Try to do better," would it be
   a. because this is something she might say to get pupils to try harder, or
   b. because your work wasn't as good as usual?
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