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LEARNED HELPLESSNESS AND REINFORCEMENT RESPONSIBILITY IN CHILDREN

CAROL S. DWECK [1] AND N. DICKON REPPUCCI [2]

Yale University

In an attempt to demonstrate the effects of low expectancy of reinforcement and low expectancy for control of reinforcement on performance in an achievement situation, 40 fifth-grade children (20 boys and 20 girls) were given successes (soluble block designs) by one adult (success experimenter) and failures (insoluble block designs) by another (failure experimenter) with trials from each being randomly interspersed. A number of children failed to complete problems administered by the failure experimenter when her problems became soluble, even though they had shortly before solved almost identical problems from the success experimenter and continued to perform well on the success experimenter's problems. The subjects who showed the largest performance decrements were those who took less personal responsibility for the outcomes of their actions and who, when they did accept responsibility, attributed success and failure to presence or absence of ability rather than to expenditure of effort. Those subjects who persisted in the face of prolonged failure placed more emphasis on the role of effort in determining the outcome of their behavior; moreover, males displayed this characteristic to a greater extent than did females. Implications of the results for strategies of behavior change are discussed.

Expectancies have been established as important determinants of behavior in learning and achievement situations (Crandall, 1969; Rotter, 1966). The present investigation is primarily concerned with two types of expectancies: expectancy of reinforcement and expectancy for control of reinforcement (reinforcement responsibility). The former refers to the perceived probability of reward. The latter refers to the extent to which one perceives oneself as a causal agent in behavior-outcome sequences. If an individual tends to attribute the outcomes of such sequences to his own actions, he is said to display internal reinforcement responsibility; if, on the other hand, he tends to attribute them to the actions of other forces, he is said to display external reinforcement responsibility.

The influence that expectancies exert on performance in a given situation can be viewed as the combined effects of the generalized expectancies that the individual brings to the situation based on previous experience in similar situations and the expectancies he forms as a result of his experiences in the situation. While the relative contributions of each may vary, it has been demonstrated that differences in generalized expectancies can lead to predictable differences in performance, even in situations where the actual reward conditions have been held constant across subjects (James, 1957; Phares, 1955; Rotter & Mulry, 1965).

Perhaps the most dramatic demonstration of the potentially devastating effects of low expectancies has been the production of "learned helplessness" in experimental animals. Seligman, Maier, and Geer (1968) found that a large percentage of dogs given extensive pretreatment with unavoidable, inescapable shock later failed to perform the required response when the contingency was changed and shock was made avoidable and escapable. Instead, they tolerated extreme amounts of highly aversive stimulation. In many cases, prolonged, forcible exposure to the contingency was necessary before the animal began to respond on its own. Seligman et al. used the term "learned helplessness" to refer to "the learning or perception of *independence* between the emitted response of

[1] Requests for reprints should be sent to Carol S. Dweck, who is now at the Department of Psychology, University of Illinois, Champaign, Illinois 61820.

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the organism and the presentation and/or withdrawal of aversive events [p. 258]."

It is possible that children who give up in the face of failure in achievement situations are victims of a similar phenomenon: giving up may reflect their perception of independence between what they do and what happens to them. Even though failure may indeed be contingent on their response, they may not see it as such. For example, a child might perceive independence between his response and failure by attributing the outcome to the influence of some external agent; he might perceive independence between his response and outcome by attributing the outcome to his inability to perform the response, whether this is true or not. In either case, he views the situation as being beyond his control.

One purpose of the present study was to determine whether there would be any evidence of a deterioration in performance if the necessary conditions for the production of helplessness were recreated in an achievement situation using failure as the aversive event. As in the Seligman et al. studies, failure was noncontingent (i.e., independent of the subject's responses) and unavoidable. A low expectancy of reinforcement and a low expectancy for control of reinforcement were created in a situation in which subjects were motivated to succeed and had the ability to succeed when the contingency was changed.

While a child may be helpless in general, it is probably more common for the phenomenon to be limited to a specific area of endeavor, such as math versus spelling, or to the presence of a particular situation or person, such as one teacher versus another. Therefore, an additional purpose of the study was to determine whether the effect could be brought under stimulus control, that is, whether a performance decrement could be elicited in the presence of one experimenter but not another. Thus, the subjects were given continued success (readily soluble problems) in the presence of one adult (success experimenter) and continued failure (insoluble problems) in the presence of another (failure experimenter). Trials within each condition were randomly interspersed. Expectancies and performance in the presence of each adult were monitored. At a specified point, the failure experimenter administered soluble problems. It was expected that, as a result of the low expectancy of reinforcement, a number of subjects would fail to solve these problems, even though they had solved almost identical ones from success experimenter only shortly before.

A more interesting question, however, is what distinguishes those children who tend to give up in the face of failure from those who do not? Is learned helplessness a useful conceptualization for understanding this difference? Another major purpose of the study, then, was to determine whether the children who are most prone to the debilitating effects of adverse reward conditions do indeed perceive independence between their responses and outcomes in achievement situations. Do those children who show the greatest performance decrements in the face of failure have characteristic generalized expectancies for control of reinforcement; that is, do they display certain patterns of reinforcement responsibility as measured by the Intellectual Achievement Responsibility (IAR) Scale (Crandall, Katkovsky, & Crandall, 1965)?

It was hypothesized that those children who gave up in the face of prolonged failure, as opposed to those who persisted in their efforts, would have profiles on the IAR that reflected (*a*) relatively less personal responsibility for successes and failures and (*b*) a relatively greater tendency to view outcomes, when attributed internally, as due to the presence or absence of ability as opposed to effort. Conversely, it was expected that the persistent subjects would be more likely to (*a*) view their successes and failures as caused by their own actions and (*b*) attribute outcomes to the presence or absence of effort as opposed to ability. This posture would lead to escalation of effort in the belief that obstacles are surmountable and that this is the means of surmounting them. (The task was sufficiently ambiguous to permit a variety of attributions; it was expected that they would vary according to the generalized expectancies of a given subject.)

In short, then, it was predicted that the low expectancy of reinforcement and low expectancy for control of reinforcement established in the presence of the failure experimenter would differentially affect behavior as a function of the generalized expectancies for

control of reinforcement that the individual brought to the situation.

METHOD

Subjects

The subjects were 20 female and 20 male fifth-grade students from four different elementary schools in a lower middle-class suburb of New Haven, Connecticut. They were selected at random from alphabetical class lists.

Experimenters

The experimenters were the first author and a paid research assistant, both females in their early twenties. Neither experimenter was aware of the children's scores on the IAR scale.

Experimental Task

The task consisted of a series of individually administered block designs. The subject was shown a card with a four-block design on it and was asked to replicate the pattern with the four blocks he was given. All of the designs on the training problems were formed from two solid-color sides and two split-color sides; in the design shown, the four blocks were always placed so that they formed a square. The success experimenter administered the same problems as the failure experimenter, except the designs were rotated 90, 180, or 270 degrees and were given in a different order. On each of her trials, the success experimenter showed the design card and gave the subject four Wechlser-Intelligence-Scale-for-Children (WISC)-type blocks, each of which had two red sides, two white sides, and two diagonally split (red/white) sides. Thus, the problems given by the success experimenter were always soluble. On each of her trials, the failure experimenter showed the design card and gave the subject four blocks: one like the above and three blocks with all sides split. Thus, the training problems given by the failure experimenter were never soluble, since the designs displayed required two solid sides showing.

1. Test problems: The test problems consisted of designs formed from one solid side and three split sides. Thus, the problems were soluble with both sets of blocks. (Pretesting showed no differences in the time taken to solve the test problems with two sets of blocks.) There were two pairs of test problems that were identical except for the angle of rotation. One pair of problems was administered by the success experimenter, the other by the failure experimenter.

2. Probe problems: These were similar to the test problems, but *both* pairs were administered by the success experimenter to check for the effects of fatigue and practice on performance.

Apparatus

The blocks used to form the designs were 1-inch cubes of the type used in the WISC; the designs displayed were 1×1 inch and were drawn in color (red and white) on individual 4×5 inch pieces of white cardboard. The subjects were rewarded for correct problems with small plastic chips that they could turn in for prizes (worth about $1) at the end of the session. The prizes consisted of games and crafts appropriate for children of that age and were displayed on a table behind the seated subject, so as not to present a distraction during the task.

On the table, in front of each experimenter, was a light enclosed in a white Plexiglas container about 9×6 inches, which was illuminated via a hand switch to indicate which experimenter was going to administer the following problem. It also served to shield the stimulus cards, blocks, data sheets, and stopwatches from the view of the subject, both when he entered the room and throughout the experimental session.

Procedure

Each subject was seen individually and was escorted by the two experimenters from his classroom to an experimental room within the school. In each of the schools, the experimental room was set up in a similar fashion. En route to the room, the subject was asked in a friendly way if he had heard anything about the situation. Upon arrival, he was seated on one side of the table (containing the apparatus) facing the experimenters. The following instructions were then given:

> [Experimenter 1] We're going to give you some problems to solve. Every time you solve one, you'll get a chip [*the experimenter holds one up*]. Do you see those prizes over there? If you do well and earn a lot of chips, you can trade them in at the end for a prize, okay? [If the subject asked how many chips he needed, the experimenter told him to try to earn as many as he could.]
>
> Sometimes I will give you the problem, and sometimes Miss _____ will give it to you. You'll know who's going to give it by which light goes on. When I give you a problem, I'll turn this light on, show you a card, and give you some blocks. Then you'll try to make the pattern that's on the card with the blocks. Watch me. [The experimenter demonstrates by forming the design.] You see, the patterns are the same.
>
> [Experimenter 2] When I give you a problem, I'll do the same thing. I'll turn on this light, show you a card, and give you the blocks. You'll try to copy the pattern like this. [The experimenter does the problem.] See, this [points to the blocks] is like this [points to the card].
>
> [Experimenter 1] Before we start, I'd like to ask you to do one more thing. Before each problem, as soon as you see the light go on, I'd like you to tell me how well you expect to do by picking a number from 0 to 10. If you are *sure* you are going to get it right, say a high number like 9 or 10. If you're sure you're *not* going to solve it, pick a low number like 0 or 1. If you're not sure how well you'll do, pick a number in the middle, like 5. Do you understand? Remember, 10 means you'll get it right for sure, and 0 means you'll miss

TABLE 1

NUMBER AND POSITION OF TEST AND PROBE PROBLEMS RELATIVE TO THE TRAINING PROBLEMS

Experimenter	Training problem	Test 1	Probe 1	Training problem	Probe 2	Test 2
Success	10	2	2	16	2	
Failure	10			20		2

it for sure. [If at any subsequent point, the subject failed to state his expectancy, the experimenter said: How well do you think you'll do this time?]

Problems from the success experimenter and the failure experimenter were interspersed and administered in a predetermined random order (with the constraint that neither administered more than four problems in a row). Which experimenter was designated as the success experimenter, which experimenter gave the instructions, which experimenter began and followed which sequence of presentation, and which experimenter used which set of design cards were also randomly determined for each subject but were counterbalanced across subjects.

After each successfully completed problem, the experimenter said, "Very good, you get a chip," or "Fine, you get another chip."

The stated expectancy and the speed and accuracy of the subject's performance were noted on each trial. A time limit of 30 seconds was set for the first 10 trials and one of 20 seconds for those thereafter. If the subject was still working at the time limit, or presented an incorrect design, the experimenter removed the blocks and said, "No, that's not right." If the subject said that he could not do it or could not find the right block, the experimenter did not respond directly but waited until the time had elapsed and said, "You didn't get it, no chip" or "Sorry, no chip."

Table 1 shows the positions of the test and probe problems relative to the training problems. After each experimenter had given 10 training problems, the success experimenter administered two test problems.[3] After each experimenter had given 20 more problems, the failure experimenter administered two soluble test problems which were the same as the success experimenter's, except that they were rotated. In addition, in place of 4 of the training problems, the success experimenter gave two pairs of probe problems in positions similar to those of the test problems to check for the effects of practice or fatigue.

At the end of the session, each child was told that he had done extremely well. It was pointed out that some of the problems were very difficult, but that he had earned an unusually large number of chips. He was then permitted to trade in his chips for the prize of his choice. Each child was asked not to discuss the situation with other members of the class; he was told that the others, too, would get their turn and that telling them would spoil their fun. If, on the basis of answers to the initial questioning or of behavior or verbalizations during the task, any subject was suspected of not being naive about the experimental situation, the data from that subject were not used. This was done on two occasions. However, as an additional precaution, subjects in a given school were seen within as short a time span as possible, and the experimenters then moved to a new school.

[3] Six subjects who failed to solve both of these problems were discontinued; they were given several more successful trials and a prize.

Intellectual Achievement Responsibility (IAR) Scale

One month prior to the beginning of the experiment, the second author administered the IAR scale (Crandall et al., 1965), in written form, to all of the children in the classes from which the subjects were to be drawn. The IAR is made up of 34 forced-choice items. The stem of each item describes a positive or negative achievement experience that typically occurs in the lives of children. It is then followed by two alternatives, one attributing causality to the behavior of the child (internal responsibility) and one attributing causality to the behavior of another person in the child's environment (external responsibility). A child's responsibility for success ($I+$) is determined by summing all of the positive events for which he takes credit; responsibility for failure ($I-$) is determined by summing all the negative events for which he accepts blame. The total I score represents the sum of these two subscores.

A further scoring distinction has been employed by Weiner and Kukla (1970), who pointed out that the internal success and failure stems could be divided into the two causal categories of ability and effort. The division used in the present study, different from Weiner and Kukla's in that all stems are included, yielded the following breakdown: for success, 8 ability and 9 effort stems; for failure, 7 ability and 10 effort stems.

RESULTS

Although many studies of this type divide the groups on the basis of questionnaire measures and then use these to predict to performance, this approach was not chosen in the present case. The concern was with children who give up in the face of failure. We wished to find out exactly how they perceive the relationship between their behavior and outcome in achievement situations. Thus, a first step was to distinguish children who give up from those who persist, and a second was to see how their reinforcement responsibility profiles differed. Although predictions were made, there were a number of outcomes that would have been interesting and enlightening, for

example, different patterns of responsibility for success and failure, sex differences, etc. Since there are many submeasures on the IAR, it was felt that by dividing the groups a priori with respect to one of them, we would run the risk of losing relevant information.

Production of Performance Decrement

The time taken to solve the pair of test problems from the success experimenter as opposed to the pair from the failure experimenter was compared to the time taken to solve the two similarly placed pairs of probe problems from the success experimenter. If a subject failed to solve a problem, he was given the time limit (20 seconds) as a score for that problem. Figure 1, which shows these data for females and males separately, reveals a general decrease in the time to solution for the probe problems [4] but an increase in time to solution for the test problems. An analysis of covariance, controlling for the practice effect, yielded a significantly longer mean time to solution for the second set of test problems, those administered by the failure experimenter ($F = 82.0$, $df = 1/37$, $p < .01$).

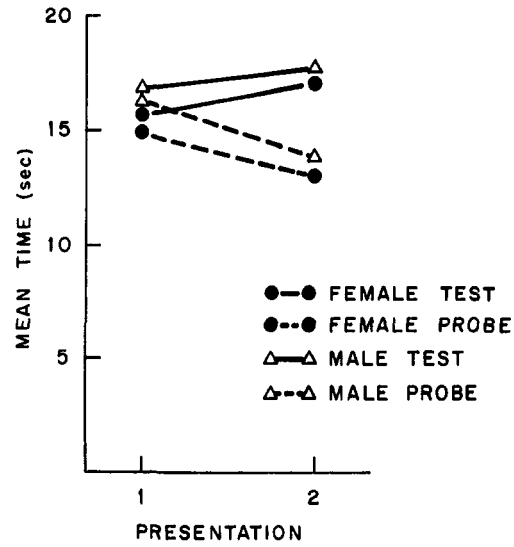

FIG. 1. Mean time to solution on the test problems and probe problems for the female and male subjects.

Division into Groups

The females and males were both divided into two groups, one of helpless and one of persistent subjects. This was done by determining the discrepancy between performance on the test problems from the success experimenter and the failure experimenter, with the effect of practice or fatigue removed (i.e., Test 2 versus Test 1 as compared to Probe 2 versus Probe 1). The subjects were then split at the median, with those failing to solve the problems or showing the greatest increase in time to solution designated as helpless.[5] Eight of the helpless females failed to solve one or both of the second set of test problems, and 9 of the helpless males failed to solve one or both of them. Given the striking practice effect on the probe problems and given the fact that the subjects had successfully solved the first test problems from the experimenters only shortly before, failure to solve the second test problems or large increases in time to solution was taken as evidence for decreased motivation in the presence of the failure experimenter. Improvement in time to solution on the second set of test problems, despite low expectancy of reinforcement from the failure experimenter, was taken as evidence of persistence in the face of failure.

Figures 2 and 3, which present the mean times to solution on the test and probe problems for the helpless and persistent females and males, provide evidence for the specificity of the performance decrement on the part of the helpless subjects. It can be seen from these figures that although the helpless and persistent subjects diverge on the test problems, they evidence rather similar improvements in performance on the probe problems. Thus, the performance decrement suffered by the helpless subjects appears to be specific to the failure experimenter.[6] In addition, the figures show that the two groups did not differ in initial level of performance on the first set of test problems. In fact, the helpless females

[4] The data are remarkably consistent across subjects in showing practice rather than fatigue effects on the probe problems.

[5] The label "helpless" is somewhat premature at this point, since it has not yet been demonstrated that these subjects perceive independence between their behavior and outcomes. However, for purposes of clarity and continuity, the same label is employed throughout.

[6] Those subjects who might have experienced a total disintegration of performance probably failed to solve the first pair of test problems and were therefore discontinued.

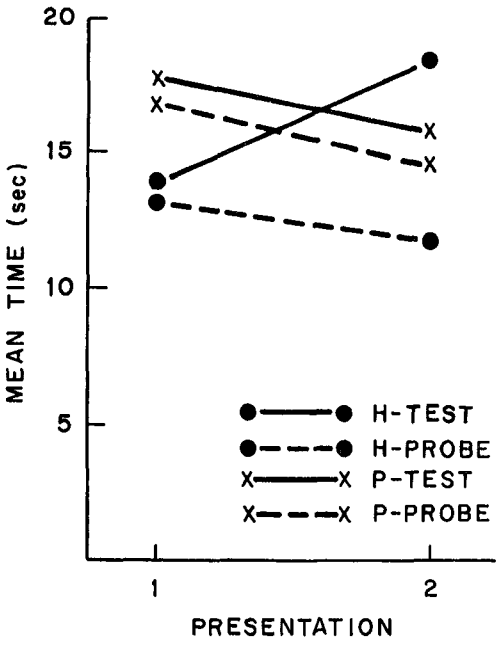

FIG. 2. Mean time to solution on the test problems and probe problems for the helpless (H) and persistent (P) females.

appear to have solved the first set of test problems more quickly than the persistent females.

An analysis of the stated expectancies of success obtained from each subject prior to each trial showed no reliable differences among the groups either in initial or final expectancies or in shifts in expectancy following success and failure.

Reinforcement Responsibility

To determine whether the subjects who showed the largest performance decrements differed in reinforcement responsibility, the IAR profiles of the groups were compared along the following dimensions: (*a*) overall internal responsibility (total *I* score); (*b*) responsibility for success ($I+$ score); (*c*) responsibility for failure ($I-$ score); (*d*) responsibility for success attributed to ability ($I+_a$) or effort ($I+_e$); (*e*) responsibility for failure attributed to ability ($I-_a$) or effort ($I-_e$).

Table 2 presents the mean internal responsibility scores for items with positive and negative outcomes and ability and effort stems on the IAR for the helpless and persistent females and males. An analysis of variance of total *I* scores revealed a highly significant difference between the helpless and persistent groups in the tendency to take responsibility for outcomes ($F = 16.45$, $df = 1/36$, $p < .01$). There was no difference between the two sexes in this tendency ($F < 1$). Similarly, analyses of the $I+$ and $I-$ scores showed reliable differences between the helpless and persistent subjects ($F = 8.94$ and 14.38, respectively, $df = 1/36$, $p < .01$), but no sex differences ($F < 1$). Thus, the data show that, in general, the persistent subjects took greater personal responsibility for their intellectual academic performance regardless of the valence of the outcomes; they assumed more credit for their successes as well as more blame for their failures.

A comparison of the degree to which successes were internally attributed to ability ($I+_a$) and to effort ($I+_e$) among the groups yielded no differences between the helpless and persistent subjects or females and males in the tendency to attribute success to ability but a significant difference between the helpless and persistent subjects in the tendency to attribute success to effort ($F = 18.91$, $df = 1/36$, $p < .01$). In other words, on the items containing motivational stems, persis-

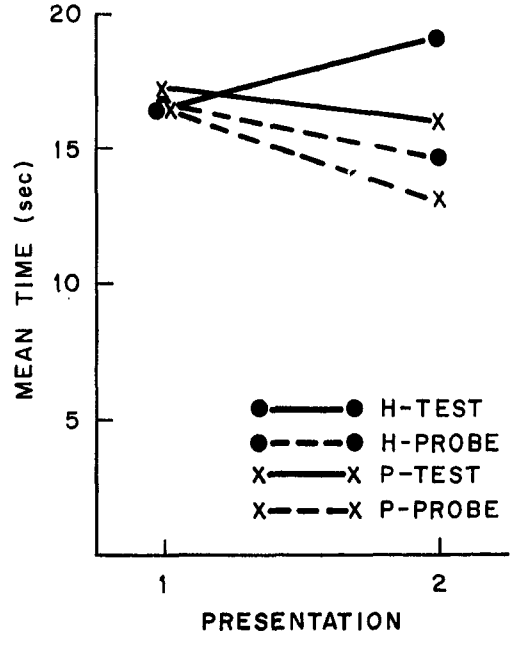

FIG. 3. Mean time to solution on the test problems and probe problems for the helpless (H) and persistent (P) males.

tent subjects were more likely to choose the internal response alternative than were the helpless subjects.

A comparison of the degree to which failures were internally attributed to ability ($I-_a$) and to effort ($I-_e$) among the groups also showed no differences between the helpless and persistent subjects or females and males in the tendency to attribute failure to ability. There were reliable differences, however, between both the helpless and persistent groups *and* female and male groups in the tendency to attribute failure to lack of effort. The subjects in the persistent groups were significantly more likely to assume responsibility for failures involving motivational deficiencies than were subjects in the helpless group ($F = 24.98$, $df = 1/36$, $p < .01$), as were males in comparison to females ($F = 5.96$, $df = 1.36$, $p < .05$).

TABLE 2

MEAN INTERNAL RESPONSIBILITY SCORES FOR ITEMS WITH POSITIVE AND NEGATIVE OUTCOMES AND ABILITY AND EFFORT STEMS FOR HELPLESS AND PERSISTENT FEMALES AND MALES

Subject	I	I^+	I^+_a	I^+_e	I^-	I^-_a	I^-_e
Female							
Helpless	23.7	13.0	6.2	6.8	10.7	4.8	5.9
Persistent	27.8	14.7	6.4	8.3	13.1	5.1	8.0
Male							
Helpless	23.1	12.2	5.6	6.6	10.9	4.0	6.9
Persistent	28.3	14.6	6.5	8.1	13.7	4.6	9.1

Note.—$n = 10$ in all cases.

DISCUSSION

The results of the present investigation indicate that learned helplessness may be a useful conceptualization for understanding the behavior of certain children in achievement situations. When subjected to continued noncontingent failure, the performance of some children deteriorated, while the performance of others did not, although all were motivated to succeed, and all had the ability to do so. The results lend strong support to the hypothesis that those children exhibiting a worsening of performance in the face of failure hold different beliefs about the control of reinforcement in achievement situations. In their tendency to attribute failure to the influence of external factors and to ignore the role of motivation, they revealed a belief in their powerlessness to control the outcomes of events. In essence, they are saying to themselves that whether they try or not, the consequence will be the same. Thus, in the sense that they view outcomes as relatively independent of what they do, they are "helpless."

As predicted, the less persistent subjects took less personal responsibility for outcomes. Since the presence or absence of persistence is a measure of achievement striving, it might be useful to examine some studies which have sought to link achievement-related motives to reinforcement responsibility. For example, Weiner and Kukla (1970) found their measure of resultant achievement motivation to be positively related to reinforcement responsibility in their fifth-grade sample only for favorable outcomes for male subjects. As these authors themselves suggest, however, instruments currently available for assessing achievement motivation may be inadequate for females. Perhaps the more behavioral measure used in the present study served to overcome this problem. It is also possible that the manipulation employed was powerful enough to override most sex differences typically found in achievement situations. In addition, there appear to be sampling differences between the two studies, with the subjects in the present study showing greater responsibility for both positive and negative events. Indeed, Weiner and Kukla's subjects showed consistently lower $I-$ scores than did the subjects on whom the measure was standardized (see Crandall et al., 1965).

Other investigations of achievement striving, using different measures of reinforcement responsibility and varied subject populations, have yielded results that are consistent with the present findings. Butterfield (1964) correlated measures of locus of control, frustration reactions, and test anxiety and found that frustration reactions became less constructive as locus of control became more external. Moreover, he found that debilitating anxiety reaction scores increased and facilitating anxiety reaction scores decreased as locus of control became more external. Rotter (1966) presented evidence to suggest that high-achievement-motive groups tended to be more internal than low-achievement-motive groups. Finally, Bialer (1961)

reported that when mental age was held constant, internal subjects were more likely to choose to repeat uncompleted tasks than were more external subjects.

The hypothesis that persistent subjects would place more emphasis on the role of effort in determining outcomes also received confirmation. In the study previously cited, Weiner and Kukla (1970) reported differences between their high- and low-achievement-motive groups in the tendency to internally attribute failure to ability versus effort. They found that in their samples beyond the fourth grade, those subjects low in resultant achievement motivation were more likely to attribute failure to lack of ability than the high achievement motive group, and that in three of their five samples, the high achievement motive group attributed failure to personal motivation more frequently than the low-achievement-oriented group. Only the latter relationship was supported by the present investigation.

The fact that both the helpless and persistent female subjects were less likely to internally attribute failure to lack of effort than their male counterparts suggests that females might be more prone to deterioration of performance in the face of failure. Although the data indicate a slight tendency for more females to succumb to the effects of low expetancies, and for the females who slowed down to do so to a greater extent than the males, this tendency did not approach significance in the present experiment. This, however, is a finding in need of further exploration.

Crandall et al. (1965) have presented some evidence to suggest that IAR scores are positively correlated with achievement test measures and report card grades for Grades 3, 4 and 5, although the subscores are differently related to these measures for the two sexes and for the three grades. In the present investigation, the authors believe that the IAR was so strongly related to performance because of the novel and nonspecific nature of the task and because of the ambiguity of the responsibility for failure. The IAR asks general questions mostly about tests, games, puzzles, etc., and it is thought to be precisely these generalized expectancies which the child brings to a new situation.

Finally, the present findings have implications for strategies of behavior change or transfer of behavior from a training situation.

1. Transfer of expectancies: If expectancies influence performance and if expectancies can be brought under stimulus control, then one can use a discriminative stimulus to mediate generalization from the training situation to other situations.

2. Attribution retraining: If a greater sense of reinforcement responsibility and greater attribution of success and failure to expenditure of effort lead to more adaptive achievement orientations, then a training procedure which addresses itself to these characteristics should produce both greater resistance to extinction within the training situation and greater generalization to new situations.

The second possibility, that of attribution retraining, is presently being investigated, and its feasibility as a treatment procedure awaits further results.

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