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THE POSITIVE ANALOGUE OF LEARNED HELPLESSNESS

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The Positive Analogue of Learned Helplessness

by

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ABSTRACT

THE POSITIVE ANALOGUE OF LEARNED HELPLESSNESS

by

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The theory of learned helplessness involves the detrimental effect on later learning which is assumed to result from the experience of a noncontingent relationship between outcomes and behavior, i.e., between responses and reinforcers. One implication of this concept is that the helplessness can result from the noncontingent occurrence of positive as well as negative outcomes.

Relatively little work has been done to replicate the cross-modal generalizability of learned helplessness, that is, whether the deficit can be produced on a cognitive task following an instrumental pretreatment (or vice versa). In the present research, it was hypothesized that (1) cross-mo-

dal learned helplessness would be replicated in a traditional negative outcomes condition; (2) similar performance deficit would be produced in a positive context; (3) differential cognitions (e.g. awareness, attributions, affect) would distinguish the groups, since learned helplessness has usually been interpreted as resulting from the phenomenal experience of uncontrollability.

A two-phase study was carried out, consisting of an instrumental pretreatment and a cognitive test task. For the instrumental pretreatment task, subjects aimed a light gun at a flat black and white target with a photoreceptor cell at the bullseye. The light beam was not detectable to the subjects; they thus received only the feedback intended by the experimenter. Half the experimental subjects received negative feedback, punishment (the sound of a tone), when they failed to hit the bullseye; the other subjects received rewards (the same tone) when they hit the bullseye. Within each condition, half the subjects received outcomes contingent on their performance. The other subjects, yoked to contingent subjects, noncontingently received the identical schedule of "hits" and "misses" as the contingent person they were yoked to, irrespective of their actual target-shooting performance. A control group received no pretreatment, but went directly to the anagrams test task. This anagrams task, the same for all subjects, was the main dependent measure, the measure of learned helplessness.

Consistent with outcomes predicted by the learned helplessness formulation, it was found that equal performance deficits resulted from receiving noncontingent outcomes cross-modally, both in an aversive context, as in previous research, and in the rewarding situation as well. There was no enhancement of performance for contingent groups. There was no greater awareness of noncontingency for any group, contingent or noncontingent, nor any differential experience of helplessness for contingent or noncontingent subjects. Different patterns of attributions did not distinguish the groups, nor did changed levels of anxiety, depression or hostility.

An important aspect of this research is that the learned helplessness effect, the behavioral decrement, took place in the absence of the cognitions usually adduced to explain the effect. Because feedback came from one source only (the apparatus --- tone or no-tone), the "helpless" subjects were not aware of the noncontingency between response and feedback. For that reason, there was no link between cognitions and helplessness. The behavioral deficit occurred independently of any awareness of noncontingency or feelings of helplessness. The helplessness effect demonstrated here thus lends itself to explanation within the behaviorist framework, which posits no necessary relationship between cognitive variables and changes in behavior.

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INTRODUCTION

Theoretical Background

The cornerstone of learned helplessness theory (Seligman, 1975) is that an organism can learn about two probabilities conjointly. Separately, a person can learn (1) the probability of an outcome occurring if he or she makes a response, and (2) the probability of an outcome occurring if that response is not made. When organisms experience events in such a way that the probability of the outcome is the same whether or not the particular response occurs, then conjoint learning of this noncontingency takes place as well.

An attempt by Maier and Seligman (1976) to carefully delineate the theory of learned helplessness describes three separate stages in the phenomenon. The first involves the way in which an organism receives information regarding the probability of the outcome.

The second, critical, stage involves the organism registering and processing cognitively the information about the contingency received in the first stage. This stage can be subdivided into two parts: (1) learning there is no relationship between response and outcome; and (2) developing the expectation that response and outcome will remain independent in the future. Along with this second stage is a reduction in motivation to control the outcome. The expectation of noncontingency keeps a person from learning that subsequent responses may produce a desired outcome, a form of proactive interference. It also produces fear while the subject is uncertain of the uncontrollability of the outcome, and then depression.

A modification of the theory (Abramson, Seligman & Teasdale, 1978), based on attribution theory, attempts to reformulate learned helplessness in terms of whether outcomes are uncontrollable for all people or only for some people, whether helplessness is general or specific, and whether it is chronic or acute. According to this reformulation, once people perceive noncontingency, they make attributions for their helplessness. These causal attributions predict whether the expectation of future helplessness will be stable or unstable, broad or narrow, and internal or external. And it is this expectation which determines the occurrence of the helplessness deficit.

The third stage described by Maier and Seligman (1976) involves the transfer of this expectation of no relationship between response and outcomes to new situations. This transfer to new situations, and its behavioral manifestations, is known as the learned helplessness effect.

Relevant Research

The existence of the learned helplessness phenomenon

The phenomenon of learned helplessness was discovered by Martin Seligman and his associates while investigating the effect of Pavlovian fear conditioning on subsequent escape-avoidance behavior. Overmier and Seligman (1967) found that dogs given inescapable shock in a hammock subsequently failed to escape shock in a shuttle-box, where escape was possible, and that even an occasional correct response in the shuttle-box did not generalize into learning. These dogs behaved passively and simply failed to learn the appropriate response. In contrast, dogs given escapable shock or no prior shock escaped well.

Fosco and Geer's (1971) research was designed to see if a similar phenomenon could be demonstrated in humans. In this research, subjects were exposed to varying numbers of insoluble problems before receiving soluble ones. All subjects received a total of twelve problems; each involved guessing the correct sequence of buttons to push to avoid shock. The major independent variable was the number of insoluble problems (0, 3, 6, or 9) preceding the soluble ones. A significant main effect was found: there were more mistakes on the last three problems (dependent measure) the greater the number of insoluble problems the subject had previously been exposed to. It was not clear, however, whether it was the inability to control the aversive stimuli or the aversiveness itself which accounted for the effect.

Another experiment attempting to show a learned helplessness effect in human subjects was carried out by Thornton and Jacobs in 1971. In this research, four groups differing in shock contingency were given a fixed level of shock, and another four groups were given a variable level of shock. For fixed level groups, the shock for each subject was kept at a level the subject considered "unpleasant but not painful". The variable level of shock ranged from "low to moderate intensity"; one of five shock levels was randomly assigned to each trial. In the test phase (dependent measure), the task was to escape from the shock by pressing a button. The authors found that under variable shock conditions, subjects who had received noncontingent shock responded more slowly on the test task than those who had received contingent shock. There was no difference among shock-contingency groups for subjects who had received fixed shock in the pretreatment phase. An important problem in this research was that the fixed shock groups received different amounts of actual pretreatment shock than did the variable shock groups. Again, as in Fosco and Geer (1971), this is problematical, since a confound is created between amount of shock and controllability, and if the effect can be attributed to anything other than uncontrollability, then it does not fit Seligman's (1975) conception of learned helplessness.

Uncontrollability as the cause of learned helplessness

Overmier and Seligman (1967) had posited that the learned helplessness effect resulted from receiving aversive stimuli in a situation in which all instrumental responses were useless in eliminating or reducing the aversiveness. Seligman and Maier (1967) demonstrated, by means of the following experiment, that this effect was, in fact, caused by the uncontrollability of the original shocks, and not by the shocks themselves. They gave one group of dogs 64 unsignalled shocks which could be escaped by pressing a panel. A second group of dogs, yoked to the first group, was given the same shocks, but could not escape them. A control group of matched dogs was not given any shock sessions. Twenty-four hours later, the dogs were placed in a shuttle- box and given ten trials of escape-avoidance training. Of the dogs who had been given inescapable shock, 75% failed to learn to escape in the shuttle-box, whereas all the animals who had been able to escape in the first phase learned the escape response in the shuttle-box. Of the control group animals, only 12.5% failed to escape in the shuttle-box. In addition, the no-escape group differed significantly from the escape group and from the control group on mean latency and mean number of failures to escape in the shuttle- box.

Maier (1970) confirmed that it was the uncontrollability that caused helplessness. In order to escape shock, dogs were trained to inhibit the head movements which are the usual response to shock. Following this training in passive response, these animals learned to escape-avoid normally, compared to yoked animals given no means of controlling the shock. Maier thus successfully eliminated the possibility that it was incompatible skeletal-motor responses that were responsible for the failure to escape-avoid.

Additional evidence for the learned helplessness hypothesis is widespread in the animal learning literature, and is reviewed in Maier and Seligman (1976).

In another experiment, designed partly to test whether it is the stressfulness of the aversive event which accounts for the learned helplessness effect, Krantz, Glass and Snyder (1974) varied the amount of stress (level of noise) administered to subjects. Although the typical learned helplessness effect was found for subjects in the no-escape condition, the amount of helplessness did not vary directly with the amount of stress. The authors conclude that the magnitude of the stress "does not facilitate the production of helplessness and its behavioral consequences" (p. 293).

In other words, the level of stressfulness was not critical in producing helplessness.

An experiment described by Glass and Singer (1972) manipulated the perceived controllability of shock. Half of the subjects believed they had some ability to avoid shock; the other half did not. Results showed the no-perceived avoidance groups were impaired in their performance on a subsequent Stroop Color Word Test and on a proofreading task, compared to perceived avoidance and to control groups. That is, even though the perceived avoidance subjects received the same intensity and amount of shock as those in the no-perceived avoidance groups, the belief that they had some control and had been able to avoid some of the shocks markedly reduced their subsequent performance deficits.

Seligman (1975), reviewing some of this evidence, states, "It is not trauma in itself that is sufficient to produce failure to escape but learning that no response at all -- neither active nor passive -- can control trauma" (Seligman, 1975, p. 27).

Experiments with human subjects

A variety of studies with humans has demonstrated that exposure to uncontrollable aversive stimulation produces performance decrements on subsequent response-dependent tasks. Some of this research has been mentioned above (Fosco and Geer, 1971; Thornton and Jacobs, 1971; Glass & Singer, 1972; Krantz et al., 1974).

In 1974, Hiroto attempted to duplicate the conditions of Seligman and Maier's (1967) original learned helplessness triadic design, using human subjects. Hiroto (1974) assigned subjects to one of three pretreatment groups: (1) Escape, in which a subject heard aversive tones but was able to escape them (by pushing a button which terminated them); (2) No-escape, in which a subject heard the same tones, was given the same escape instructions, but in reality was unable to escape the tones; and (3) Control, in which a subject was not required to hear the tones. This pretreatment phase was followed by a test phase in which subjects were again required to escape an aversive tone, this time using a finger shuttle. Escape in this test phase was available equally to all subjects. The dependent variable was performance on this test phase, measured in several different ways. Hiroto found poorer performance on four out of five of the dependent measures among subjects who had been in the no-escape pretreatment condition, thus duplicating Seligman and Maier's (1967) results with dogs.

Hiroto and Seligman (1975) were interested in testing the notion that learned helplessness results from exposure to uncontrollable outcomes in cognitive situations as well as in instrumental ones. They theorized that insoluble discrimination problems were formally analogous to inescapable aversive situations, since in both the probability of reinforcement (correct vs. incorrect, or shock vs. no-shock) was independent of responding. They devised an experiment using a discrimination-learning task requiring the subject to identify a correct value. In the Insoluble condition, analogous to no-escape from aversive noise, there was no value which was consistently correct, no way to solve the problem. A control group was required to see the discrimination task cards but take no action. The test phase consisted of soluble anagrams, the letters of each of which were arranged in a particular pattern. Thus, the pretreatment phase and the test phase both utilized cognitive tasks.

As part of the same program of research, Hiroto and Seligman (1975) were interested in replicating Hiroto's (1974) instrumental pretreatment/instrumental test paradigm. In addition, they wanted to explore the extent to which helplessness could be produced cross-modally, that is, in a situation in which either pretreatment was instrumental (pushing a button to escape noise) and the test was cognitive (anagrams), or pretreatment was cognitive (discrimination problems) and the test phase was instrumental (finger-shuttle to escape the aversive tone). Thus this research consisted of four separate experiments:

Experiment	Pretreatment phase	Test phase
1	Instrumental (push-button)	Instrumental (finger-shuttle)
2	Cognitive (discrimination problems)	Cognitive (anagrams)
3	Instrumental (push-button)	Cognitive (anagrams)
4	Cognitive (discrimination problems)	Instrumental (finger-shuttle)

Each experiment used the triadic design, with three pretreatment contingency groups (i.e., escape or soluble problems, no-escape or insoluble problems, and a control group). Instrumental no-escape subjects and control subjects were yoked to escape subjects, so that the total duration of the aversive tones was the same for all subjects in the instrumental pretreatment groups.

Three dependent measures were used in the test phase: (1) mean response latency; (2) number of failures (to escape the noise or to solve the anagrams); and (3) trials to criterion (for escape acquisition or solution to anagram pattern). Thus there were 12 measures in all: three dependent measures in each of four experiments.

For ten of the twelve combinations, the no-escape or no-solution group performed significantly worse than the escape (or soluble puzzle) group. For seven of these ten combinations, the no-escape group did significantly worse than the control group, thus indicating a debilitation on the part of the no-escape group (learned helplessness) rather than a facilitation effect for the escape group. (With respect to the three dependent variables, there were no significant differences on the trials to criterion measure on Experiment 3, involving instrumental pretreatment and cognitive test task. The other two dependent variables did show significant decrement for the no-escape group.)

Hircto and Seligman consider that learned helplessness not only has been replicated in an instrumental situation, but has been demonstrated when both tasks are cognitive. Most importantly, it has been shown to be cross-modal, occurring when pretreatment is instrumental and testing cognitive, and vice versa. Thus, helplessness is considered to be transferable across situations. The authors attribute helplessness brought about in this way to a generalized expectancy that in future situations responding and reinforcement will continue to be independent of each other, and a person will be unable to modify events in his or her environment.

Not all the experiments in learned helplessness have produced the expected effect. Roth and Bootzin (1974), for example, found that a group receiving random feedback on a concept learning task showed more adaptive behavior in a subsequent aversive situation than did no-pretreatment subjects. However, it is questionable whether the dependent measure (going to get the experimenter's help when the screen blurred) is necessarily a measure of control; these subjects may simply have been more anxious or more frustrated.

The weight of the evidence suggests a fairly reliable helplessness effect on a variety of dependent measures following a variety of helplessness-inducing manipulations. Most research has kept the pretreatment and test phase modalities the same, however, using either an instrumental pretreatment and instrumental test (e.g. Hiroto, 1974; Fosco and Geer, 1971; Thornton and Jacobs, 1971), or a cognitive pretreatment/cognitive test design (e.g. Roth and Kubal, 1975; Cohen, Rothbart and Phillips, 1976; Benson and Kennelly, 1976; Griffith, 1977). Often, in recent research, relatively complicated instrumental laboratory set-ups have been replaced by more easily- administered cognitive tasks. Learned helplessness occurring across modalities has rarely been explored since Hiroto and Seligman's (1975) work.

It seems important to verify that learned helplessness can take place cross-modally. If interference with subsequent learning occurs under conditions that differ substantially from the original situation in which uncontrollable events took place, then the helplessness effect is more likely to be a stable and rather pervasive process. This notion bears on the general/specific dimension that Abramson et al. (1978) discuss in their reformulation of Seligman's older statements of his theory (e.g. 1975). If, as Hiroto and Seligman (1975) suggest, learned helplessness is generalizable across modalities, then it may be an induced "trait-like system of expectancies that responding is futile" (p. 327), and more than just a transient, situational response.

Helplessness under conditions of positive feedback

Seligman (1975) speculates that it is the noncontingency between behavior and outcomes which produces the learned helplessness phenomenon. Implicit in this theory is the notion that the type of situation in which noncontingency is learned is not especially relevant. That is, most of the instrumental research has pinpointed lack of control over aversive outcomes (typically loud noise or electric shock) as responsible for the helplessness effect that follows. The theory would predict, however, that similar effects (helplessness) would result from noncontingency or lack of control in situations not necessarily involving noise or shock, but involving neutral, or even positive, outcomes. The principal goal of the present research, then, was to explore just such a proposition -- whether, or the extent to which, noncontingency under instrumental conditions of positive reward produces learned helplessness.

<u>Animal evidence.</u>

Seligman (1975) reports unpublished research in which hungry rats who were given free food which had been dropped through a hole in the tops of their cages experienced a deficit in the learning of subsequent food-getting responses, compared to rats who had had to learn to work for their food.

Engberg, Hansen, Welker and Thomas (1972), using the learned helplessness paradigm with pigeons, found that "autoshaping" performance was retarded among animals given noncontingent free grain, compared to the performance of pigeons who had had to work for a living (jumping on a treadle in order to receive pellets of grain), and compared to a control group. ["Autoshaping", a notion developed by Brown and Jenkins (1968), involves a process whereby a direction is imposed by the species-specific tendency of a pigeon to peck at things it looks at. The tendency is strengthened by connecting reinforcement with the look-peck coupling.¢

Welker (1976) found pigeons were retarded in acquiring a treadle-pressing response following protracted exposure to response-independent grain deliveries, compared to groups of pigeons pretreated with either response-dependent grain presentation or short-term hopper training.

In an animal-learning study using the "appetitive analogue" to the learned helplessness paradigm (that is, food reward rather than electric shock as the stimulus), Palese (1977) found that contingently-rewarded rats (which had to behave in a particular way in order to get the food pellets) performed better on a subsequent acquisition task than either of two noncontingently rewarded groups, one getting its food reward from a hopper, and one having food pellets drop from the ceiling. Palese adduces compelling arguments suggesting that these results demonstrate the positive analogue to learned helplessness rather than a facilitation effect. Further research using an additional control group is currently being undertaken in order to clarify this issue.

Research using human subjects.

Eisenberger and his associates (Eisenberger, Park and Frank, 1976; Eisenberger, Mauriello, Carlson, Frank and Park, 1977) have been involved in programmatic research aimed at shedding light on what they call the learned helplessness/learned industriousness continuum. According to their theory, noncontingent presentation of a reinforcer retards the acquisition of new responses for the reinforcer (learned helplessness), and the learning of a reinforced response facilitates the subsequent acquisition of new responses for the reinforcer (learned industriousness). A reinforcer and its discriminative stimuli come to signal degrees or ranges of control over the reinforcer. Eisenberger et al. (1976) hypothesize that "the smaller the number of different responses that continually receive interchangeable reinforcement, the more the organism is moved along that reinforcer's learned industriousness-helplessness continuum toward the industriousness extreme" (p. 228).

Eisenberger et al. (1977) speculate that to be truly noncontingent, reinforcement must be presented haphazardly, sporadically, and preferably when a subject is not making a particular response. This was, in fact, the reinforcement procedure followed by Eisenberger, Kaplan and Singer (1974), and by Babad (1972).

Eisenberger et al. (1974) found that giving children positive reinforcement in the form of the word "good" presented randomly (not in response to any particular behavior) during pretreatment had a decremental effect on subsequent learning. However, if the children were informed of the new specific meaning of the use of the word "good" on the test task, the learning deficit disappeared. In other words, specifically being told of the social approval meaning of the word "good" (that is, having its contingency value restored) undid the effects of its noncontingent use during pretreatment. This result can be interpreted as evidence for the cognitive aspect of Seligman's theory of how learned helplessness has its effect: Seligman (1975) speculates that proactive interference is one of the things that happens in learned helplessness. The individual is not able to unlearn the uselessness of responding. Here, Eisenberger et al. (1974) have very deliberately, as part of their design, seen to it that their subjects do unlearn the noncontingency; learned helplessness then does not occur. However, since this experiment did not include a group which exercised control over reinforcers in the pretreatment phase, it is not possible to specify controllability as the crucial variable in this work.

In research by Babad (1972) on the "satiation" effect of reinforcement, the word "good" was used in a completely noncontingent way (that is, unrelated to subjects' behavior) with third grade children, and a performance decrement was found on a subsequent test task. This decrement was eliminated in the case of children for whom the experimenter was different on the test task, and the author concludes that the "satiation" effect of the reinforcement (which leads to the subsequent deficit) is person-specific, not generalizable from one experimenter to another.

This finding may bear on the generality/specificity dimension of helplessness expounded by Abramson et al. (1978). It may imply a lack of generalizability of the learned helplessness effect. What may just as well be happening in the Babad experiment (as it seems to in Eisenberger et al., 1974) is that the children learn in the pretreatment phase that the experimenter's "good" is meaningless. The experiment is set up in such a way that there is no reason for them to think "good" has much more meaning in the test phase, when the same experimenter reinforces arbitrarily chosen values with "good". When the experimenter is different during the test phase the children may give more credence to the reinforcements since there is no history of meaningless "goods" coming at odd intervals from the new adult.

It is questionable whether subjects' receiving "truly-noncontingent" reinforcement (so called, e.g., in Eisenberger et al., 1977), that is, receiving the word "good" at sporadic intervals unrelated to any behavior on their part (as in, e.g., Babad, 1972; Eisenberger et al., 1974; Eisenberger et al., 1977, experiments 1, 2, and 4) can be said to be experiencing noncontingent positive outcomes. If the word "good" comes to seem meaningless, it cannot logically be considered positive. In fact, a child may consider it ludicrous to be told "good" when he or she is not doing anything. So it would seem that research employing this technique, whether it leads to subsequent performance decrement or not, cannot be said to be evidence for the effects of "noncontingent positive reinforcement" (noncontingent yes, positive no). That is, it cannot demonstrate a "learned helplessness" effect.

The dissertation research of Gampel (1976) deals with the positive analogue to learned helplessness. He randomly assigned 160 college students to treatment groups in which they received either rewarding or punishing feedback in either a contingent or a noncontingent manner. Gampel also varied: (1) type of feedback (the onset of a light signifying correctness or incorrectness, or a verbal statement "right" or "wrong"); and (2) whether the type of feedback was the same or different for the two phases of the experiment. He used an elaborate design by which to control for the total number of trials and the total number of positive or negative feedbacks. Control subjects received no pretreatment, but were reinforced veridically during the test phase for either correct or incorrect responses.

The task used in pretreatment was an auditory signal detection task; subjects were required to distinguish a word heard over a noise background, and were given all-reward, all-punishment, or veridical feedback, according to their group assignment. The intensity of the noise background was calibrated for each subject individually at a level that precluded the possiblity of the subject knowing whether he or she was correct or not. This was done so that the subject could have no source of feedback regarding the correctness of his or her response other than the experimenter-controlled feedback. Subjects could thus not be aware of the contingency-noncontingency manipulations.

The test task was 40 trials on an attribute learning (cognitive) task, with a conjunctive rule and veridical feedback. Using the mean number of correct responses on the test phase as his performance measure, Campel found no differences for any of the groups except the noncontingent, both positive and negative. These two groups made significantly fewer correct responses than all other groups, none of which differed from each other. Gampel therefore concluded that the learned helplessness effect was demonstrated for aversiveness, as in previous research, and for noncontingently rewarding feedback situations as well.

The research reported by Benson and Kennelly (1976) used the learned helplessness paradigm to test whether the helplessness effect can result from noncontingently presented positive feedback, or whether aversiveness must be present as well. Benson and Kennelly used four groups, three of which were given pretreatment in the form of 5 discrimination problems. In what was an extension of the cognitive-cognitive portion of Hiroto and Seligman's (1975) experiment, subjects in the contingent and noncontingent groups were informed in the pretreatment phase that the solution to each discrimination problem would be a simple attribute value drawn from four bi-valued dimensions. At the end of each of the 10-trial discrimination problems, subjects were asked for their statements of what the correct value had been.

Group 1 subjects were given contingent truthful feedback after each solution attempt and in response to their statement at the end concerning what the correct value was. Group 2's problems were insoluble; feedback to the 10 trials was random ("correct" or "incorrect"), and to the guess about the correct value, always negative ("incorrect"). Group 3's problems were likewise insoluble, but feedback was uniformly positive: "that's correct" to the 10 trials for each discrimination problem, and "that's the right answer" to the guess as to the correct value at the end of each problem. A fourth (control) group received no pretreatment but went directly to the test situation, which was the same for all subjects. The test phase consisted of a series of 20 five-letter anagrams arranged in a particular pattern. As in Hiroto and Seligman (1975), subjects were told "there could be a pattern or principle" to the anagram solution.

The results on anagram performance were considered in terms of (1) latency; (2) number of failures; and (3) trials to criterion. Of these, only trials to criterion differentiated among the groups. Using this measure, anagram performance was significantly better for group 1, which had received veridical feedback in the pretreatment phase, than for all other groups. This result can be taken as evidence for the learned industriousness that Eisenberger et al. (1976) speak of. Benson and Kennelly call it competence; Seligman (1975) refers to "a sense of mastery" (p. 99).

Group 2, given insoluble problems, noncontingent random feedback, and "incorrect" to the guess at the end of each problem, displayed the learned helplessness effect, taking significantly more trials to criterion than all other groups. Group 3, which had been given all-positive feedback ("that's correct") to insoluble problems and "correct" to the guess at the end of each problem, performed no differently than group 4, the control group. The mean performance of groups 3 and 4 was significantly different from, and in between, that of groups 1 and 2. Benson and Kennelly conclude that learned helplessness has not been demonstrated for the always-correct condition (group 3), and that these results are "damaging to Seligman's (1975) assertion that uncontrollable positive events produce learned helplessness" (p. 143), the concomitant presence of uncontrollable aversive events being necessary to produce the effect.

Benson and Kennelly (1976) had speculated that "frustrative non-reward" appears during the interstices, so to speak, of intermittent reinforcement and causes performance deficits. That is, when there is an expectation of a reward which is subsequently not forthcoming, the subject experiences aversiveness. It was because they wished to eliminate this potential aversiveness as an explanation of what it is about positive feedback that has the debilitating effect on test performance that Benson and Kennelly decided on a schedule of continuous positive feedback for their group 3 subjects.

However, in setting up an all-positive feedback situation, Benson and Kennelly have inadvertently pointed to an important conceptual issue concerning the definition and experience of positive events. In the context of discrimination learning, veridical feedback is crucial to the solution of the problem. It enables a subject to eliminate, in some systematic way, extraneous and incorrect stimulus dimensions. Noncontingent feedback of "that's correct" each time might conceivably come to seem aversive to a person who is trying to solve the problem by eliminating incorrect guesses. It might create frustration or anger or disbelief or some question about "what's going on here?", which may then have an unknown (unpredictable) effect on his subsequent performance. It could not then be considered positive feedback at all. Some all-positive subjects might be motivated by anger at the experimenter to do very well on the subsequent test task; others might be seriously debilitated. Such a combination of results could yield a mean test task score no different from that of the control group, which is, in fact, what Benson and Kennelly found. Wortman and Brehm (1975) suggest that hostility may be what accounts for the behavioral decrement often called "learned helplessness". It may indeed be possible for hostility to produce such effects, but they could not be considered learned helplessness as defined by the theory (e.g. Seligman, 1975).

Only Koller and Kaplan (1978) seem aware that research using noncontingent feedback on a discrimination learning task can be aversive even when the feedback is positive. They say "Noncontingent conditions provided negative information in that problem-solving approaches could not be systematically verified or disconfirmed" (p. 1178). For some reason, they then go on to use this design, even with their "noncontingent success" group.

Eisenberger et al. (1977, experiment 1) present evidence altogether contradicting the notion of frustrative nonreward as a factor. They manipulated the number of responses for which subjects received reinforcement, and did not find any significant difference in the amount of learned helplessness between the group receiving positive feedback for many responses (blurring contingencies) and the group receiving positive outcomes irrespective of whether or not a response was forthcoming ("truly noncontingent" feedback). These results (1) seriously question Benson and Kennelly's notion that it is frustrative non-reward which is responsible for learned helplessness effects produced by positive outcomes, and (2) suggest that it is unnecessary to create a situation in which every single response emitted is positively rewarded.

Research by Griffith (1977) has replicated the cognitive-cognitive helplessness induction procedure used by Hiroto and Seligman (1975). In addition, Griffith has extended the analysis to include a noncontingent success group as well as a noncontingent failure group. Thus his experiment is similar to Benson and Kennelly's (1976), with the exception that instead of giving positive feedback to _every_ response of the noncontingent success subjects on the pretreatment task (as with Benson and Kennelly's group 3), Griffith gave his noncontingent success group (as well as his noncontingent failure group) a randomly mixed schedule of positive and negative feedbacks on each of the ten trials comprising a single problem. At the end of each problem, as in Benson and Kennelly (1976) and Hiroto and Seligman (1975), the subject was asked to state the correct stimulus value. Subjects in the noncontingent failure group were informed that their final solutions were incorrect; noncontingent success subjects were uniformly told that their responses as to the correct value at the end of each problem were correct.

Griffith found a performance decrement on an anagrams test task for both noncontingent groups, as measured by latency and by failure to solve. Thus he has obtained support for both a noncontingent failure effect (as did Hiroto and Seligman, 1975, and Benson and Kennelly, 1976) and a noncontingent success effect as well.

There is a potential problem in using "success" and "failure" manipulations, as Griffith did, and as Gampel (1976) and Benson and Kennelly (1976) had done before him. Although Griffith's study supports the suggestion that learned helplessness is induced by noncontingency rather than by noxious stimulation per se, generalizability of his findings is limited by a subtle potential confound. Cohen, Rothbart and Phillips (1976) have pointed out that in most learned helplessness research with human subjects there is no control for the proportion of success/failure between contingent and noncontingent groups. Thus, they suggest, the performance deficits noted in some of this research may be accounted for by a higher proportion of failure experienced by noncontingent subjects. Actually, this criticism does not hold for Gampel, as he included control for both the number of stimulus presentations and the number of reinforcements in his pretreatment phase. Cohen et al. suggest using a yoking procedure whereby noncontingent groups receive the same proportion of success and failure as the contingent groups. Such yoking would eliminate the possibility of this confound.

It may be noted that even when the proportion of successes and failures is controlled in contingent and noncontingent groups, without a yoking procedure the sequence of successes and failures may still differ for contingent and noncontingent subjects. Contingent subjects, if they improve their performance over trials, will have more successes or fewer failures over trials on the task. Typically, noncontingent subjects have been given a random pattern of successes or failures, which does not match the pattern experienced by contingent subjects. This lack of improvement with practice for the noncontingent subjects may contribute to an awareness of the noncontingency.

Hirsch's (1978) research looked at the effect of noncontingent reward on subsequent performance. The distinction between instrumental and cognitive pretreatment was somewhat blurred here, as subjects were required to figure out which button to push in response to stimuli consisting of different patterns of light. There were two pretreatment problems. Points on a counter (representing money) were awarded (contingently or noncontingently) for correct responses by subjects in the "positive reward" group. Points (again representing money) were taken away (again contingently or noncontingently) for incorrect responses by subjects in the "negative punishment" group. The identical stimulus (points on a counter) was used (as it was in Gampel, 1976) in an effort to minimize what Hirsch considered a potential confounding by differences in the reward/punishment value of the stimuli.

The test task used was simply a continuation of the pretreatment, a third light pattern/button pushing problem, only this time giving veridical feedback to all subjects (i.e. no noncontingency). Results indicated that noncontingent groups (both reward and punishment) performed worse than either contingent groups or control groups on this third (test) problem. It seems clear, however, that this paradigm did not constitute a very good test of learned helplessness. The "test" situation was identical in all respects (except reinforcement contingencies) to the pretreatment. In effect, it was merely a continuation of the pretreatment. There is no reason, therefore, not to expect subjects to have learned to diminish their efforts on this third problem, having had negative experiences on the first two.

Subjective responses, attributions, and affect

The bulk of the research in learned helplessness has focussed on the behavioral manifestations of the phenomenon. Most researchers, however, have attempted to deal, at least in passing, with less accessible aspects of the phenomenon, such as the subjective experience of helplessness or attributions made by participants. Almost all researchers routinely include questionnaires attempting to get at these issues.

Frequently included on the questionnaire are such items as whether or not subjects felt able to do the task and whether or not the task was doable. Hiroto and Seligman (1975) found significant differences between contingent and noncontingent subjects in their responses to these questions, with noncontingent subjects acknowledging feeling less able to do the tasks.

Griffith (1977) had similar results, but only from his noncontingent failure group, which felt significantly less able to solve the problems than the solvable group (which had been given veridical feedback) or than the noncontingent success group. He also found that the noncontingent failure group did not believe there was a solution to the problems as compared to the solvable and noncontingent success groups. The latter two groups did not differ from each other on either question. So that despite the fact that the noncontingent reward group was just as debilitated behaviorally as the noncontingent punishment group (both showed poor anagram performance relative to control and contingent groups) -- the two noncontingent groups differed from each other significantly with regard to what they reported they were experiencing.

In an effort to explain this finding, Griffith speculates that since the noncontingent success subjects did not perceive themselves as being helpless, the poor anagram performance of this group may have been the result simply of passivity engendered by the realization that "since accurate discrimination and hypotheses did not affect outcomes in the concept task, there was no reason to assume they would make a difference on the anagram task" (p. 453). If this is indeed what was going on here, then it seems to come close to Seligman's explanation for the learned helplessness effect. According to Seligman and Maier (1967), it is the expectation that one's responses will affect outcomes that is the incentive for initiating active responding. The theory says that learning to expect independence between responses and outcomes, and generalization of this response-outcome independence to a new situation, is what decreases the probability of response initiation, thus accounting for subsequent performance debilitation.

What sometimes may happen is that people gradually come to realize that there is a discrepancy between their subjective experience and the feedback they are being given. "I'm just not getting the hang of it" and "I am unable to control my outcomes" are the cognitions which, if they occur, may underlie the learned helplessness that Seligman posits, and which precede the slowdown of subsequent response initiation.

It is unclear to what extent subjects in previous research remained unaware of response/outcome independence. Sheldon Cohen (1978) has stated that subjects must somehow be made aware of noncontingency. He speculates that in experiments in which noncontingent subjects are "truly" yoked (i.e. not only keeping the <u>proportion</u> of reinforcements the same for contingent and noncontingent subjects, but the schedule of the reinforcements as well) -- that in such experiments, noncontingent subjects would not catch on to the noncontingency. They would then be "functionally contingent" and would not manifest the learned helplessness effect. Probably underlying this notion is the idea that noncontingent people would assume they are catching on to the task either because they are being given sufficient reinforcement to enable them to assume the erroneous hypotheses they are generating are correct (cf. Peterson, 1978), or because in some other way they are hooked into contingent subjects' learning curves.

This line of reasoning, as well as that of Seligman and Maier (1967) and Griffith (1977) assumes that cognitions are what account for the observed behavior. A consideration by Nisbett and Wilson (1977) of the way people make attributions for their behavior, however, suggests that people are often inaccurate in specifying what the relevant stimuli are which cause a particular effect. Nisbett and Wilson's position is that in most situations when people are asked to explain why they behaved a certain way, they do not do an introspection of the mental processes preceding the behavior. Instead they look for plausible explanations for their behavior from among the "implicit causal theories" they hold concerning these behaviors. They resort to "a pool of culturally supplied explanations for behavior of the sort in question, or failing in that, begin a search through a network of connotative relations until they find an explanation that may be adduced as psychologically implying the behavior" (Nisbett and Wilson, 1977, p. 249). For example, the question "Why did you enjoy the party last night?" may elicit the response "Because I liked the people there". Nisbett and Wilson argue that this response is given not as a result of searching one's memory about the party and what one liked about it. Rather, a respondent has an "implicit causal theory" about what makes parties enjoyable (namely, liking the other people present) and he or she adduces it, without much thinking, as a plausible response to the question. One implication of this idea is that "awareness of noncontingency" is not necessarily a prerequisite to learned helplessness. Perhaps the helplessness can be learned without any necessary "awareness".

Mackintosh (1973) has used the term "learned irrelevance" to refer to the phenomenon in which performance is retarded by prior experience in which responses were not predictive of reinforcement. Mackintosh suggests that organisms learn to ignore the stimulus (or the response) as a predictor of the reinforcer, and that this learned irrelevance later gets in the way of appropriate response learning. In the animal evidence which Mackintosh adduces to illustrate this idea, the notion of "awareness" is totally irrelevant.

The attribution explanation for whether or not helplessness follows perception of noncontingency (e.g. Abramson, Seligman and Teasdale, 1978) has been prominent in the research literature. Abramson et al. speculate that the expectation of helplessness occurring can be predicted by the causal attributions a person has made, and that this expectation is what determines the occurrence of the helplessness deficit.

One of the dimensions Abramson et al. address themselves to is the internality-externality dimension. They suggest that variations in attribution along this dimension might produce differences in the extent to which people feel personally (vs. "universally") helpless, as well as differences in self-esteem and depression. Not being able to do a particular task may be especially aversive when a person feels that he or she should have been able to, and that other people have been able to (internal attribution, personal helplessness). If a person, on the other hand, is unable to perform properly and it is clear that no one else would have either (external attribution, universal helplessness), then there is likely to be less stress experienced (Wortman et al., 1976) and less likelihood of helplessness occurring.

There are other dimensions of attribution which are thought to be involved in whether or not people develop the expectation of becoming helpless. Abramson et al. (1978)

speculate that global attributions are more likely than specific attributions to lead to learned helplessness in a wider variety of situations; and that stable attributions lead to more chronic deficits than do unstable ones. The importance of an outcome is considered by Miller and Norman (1979) to be a fourth dimension involved in the development of learned helplessness.

Some researchers have been interested in changes in mood or affect that may occur in learned helplessness procedures. Seligman and his associates (Seligman, 1975; Miller and Seligman, 1975; Miller and Seligman, 1976) have speculated on the role of helplessness in the etiology of clinical depression. Griffith (1977) has found some evidence for differential emotional processes among his groups. Using a scale which measured subjects' relative anxiety and depression before and after pretreatment, he found the noncontingent failure group showed a significant increase in the proportion of depression to anxiety, whereas for the noncontingent success group there was a significant pre-post change in the direction of increased anxiety (relative to depression). This is interesting, but hard to interpret since his mood measure used a forced-choice format, and unfortunately did not provide an index of absolute levels of either anxiety or depression. Gatchel, Paulus and Maples (1975), using the Multiple Affect Adjective Check List, found absolute short-term increases in anxiety, depression, and hostility for their noncontingent subjects. The positive analogue to learned helplessness was not part of their concern, however. Therefore, it remains unclear what exactly are the changes in levels of affect that occur (if any) among people subjected to noncontingent positive outcomes. As mentioned above, Wortman and Brehm (1975) suggest that hostility is what may account for the learned helplessness effect in general.

Statement of the Problem

The main purpose of this study was to test the effect on subsequent performance of noncontingent reward as well as noncontingent punishment. Seligman (1975) has speculated that noncontingent reward may have the same deleterious effect on performance as noncontingent punishment; in both situations there is nothing an individual can do to affect response-outcome sequences. The question to be asked was, Does noncontingent reward produce performance deficits similar to those produced by noncontingent punishment?

Another goal of this research was to validate the idea, initially demonstrated by Hiroto and Seligman (1975), that learned helplessness can occur across modalities. To do this, an instrumental pretreatment/cognitive testing experiment was undertaken, similar to that of Hiroto and Seligman.

This cross-modal design, rarely if ever replicated even in the context of negative reinforcement, represents the first experiment known to this writer using such a design to explore the positive analogue to learned helplessness. The relevant experimental question here was, Does learned helplessness occur cross-modally, that is, from an instrumental pretreatment to a cognitive testing situation?

In order to deal with the criticism leveled by Cohen et al. (1976) concerning the varying proportions of failure between groups in much learned helplessness research, the present experiment used a yoking procedure similar to that developed in Seligman and Maier's (1967) early experiment with dogs, and used in the instrumental pretreatment part of Hiroto and Seligman's (1975) research. This precaution ensured not only the same ratio of success/failure for both groups of experimental subjects, but also the same sequence of success/ failure, showing improvement in performance with practice. Any possible confound between success/failure and contingency/noncontingency was thus avoided. Very few researchers have used a yoking procedure in the context of a noncontingent reward design.

In an article critical of the learned helplessness formulation, Buchwald, Coyne, and Cole (1978) concluded that interference on subsequent tasks is seldom found except in situations in which subjects experience failure; to invoke noncontingency as an explanation they feel is gratuitous. The decrement may be the result of the prior experience of failure. The design of the present research is such that although it (partly) took place in a context which has been defined as "punishing", the task was doable, that is, it was not impossible or unsolvable. Since failure, as such, was not being manipulated, it was not a salient element of a person's experience, whereas noncontingency (for noncontingent subjects, of course) may have been. To find subsequent interference in this context would thus be a partial refutation of Buchwald et al.'s criticism, and supportive of the original noncontingency theory of learned helplessness.

A serious difficulty in all the experiments using cognitive problems as pretreatment (e.g. Hiroto and Seligman, 1975; Benson and Kennelly, 1976; Griffith, 1977; Koller and Kaplan, 1978) was that the feedback given to subjects by the experimenter was not the only source of information they had about the correctness of their responses. Gampel (1976) is the only researcher who has explicitly eliminated other sources of feedback. Often subjects could see for themselves when their solutions worked and when they didn't. They may very well then have suspected in the noncontingent condition that the experimenter was lying.

If it is clear to a subject that he or she is being lied to, then the noncontingency between responses and outcomes becomes clear as well. And although a subject may then show subsequent deficits on a test task, the debilitation may be a result of anger, frustration or general disaffection with the entire proceedings, an interesting effect, perhaps, but not learned helplessness as defined in the literature (e.g. Seligman, 1975).

The perceptual-motor pretreatment task used in the present research was set up in such a way that no feedback concerning performance was available to subjects except that which came from the apparatus. The task was ambiguous enough so that noncontingent subjects would not know that the feedback they were being given was non-veridical. Differential amounts of frustration or distrust among subjects would thus not be a factor.

In order to ascertain whether any significant enhancement or decrement would be attributable to the pretreatment, there was a control group of subjects which did not receive any pretreatment. (Unfortunately, this was not a "perfect" control, since this group differed along the dimension of length of exposure to the experimental environment.)

It has been commonly assumed among learned helplessness investigators that peoples' attributions determine their expectations, which in turn account for the development of learned helplessness (e.g. Abramson et al., 1978; Miller and Norman, 1979). In the present research all subjects received instructions presumably establishing a personal-responsibility set; however, people may differ in how they allocate responsibility for their outcomes to various factors. Accordingly, one of the questions asked of experimental subjects was the extent to which each of the following factors seemed to influence their performance: ability, difficulty level of the task, effort, luck, and experimenter control. Subjects who attribute their outcomes to experimenter control are directly acknowledging awareness that outcomes are out of their own control, that is, noncontingent. To some extent (though less clearly) the same thing is true of attributions to difficulty level and luck.

In order further to get at how or whether subjects experienced helplessness, they were asked the following two questions:

1) During the target-shoot, to what extent did you believe you could be successful? and

2) During the target-shoot, to what extent did you believe the task of hitting the bullseye could or couldn't be done?

Nisbett and Wilson (1977), in their discussion of the general inaccuracy of attributions for behavior, specify the conditions under which attributions are likely to be accurate. If "implicit causal theories" are what are generally adduced to account for behavior, then, when the variables producing the behavior happen to coincide with one's implicit causal theories concerning the event, the attributions will be accurate.

Attribution theory (e.g. Weiner et al., 1972) predicts that successful outcomes are attributed more to one's own effort and/or ability, whereas unsuccessful outcomes are more likely to be attributed to external factors, like luck or task difficulty. In addition, Kelley (1967) has pointed out that in a period of "rising economy" people attribute success to their own characteristics and failure to outside influences. And Alloy and Abramson (cited in Abramson et al., 1978) found that noncontingency is more difficult to perceive when one is winning than when one is losing. These notions could explain Griffith's paradoxical finding of greater experiencing of noncontingency by the noncontingent failure group than by the noncontingent success group, despite equal behavioral decrements by both.

These attributional notions also suggest that in our experiment subjects in the positive outcomes conditions (scoring "hits" in the perceptual-motor pretreatment) would more likely attribute these outcomes to their own skill or effort, whereas subjects receiving negative outcomes ("misses") would be likelier to attribute them to external factors, like task difficulty, luck or experimenter control.

To the extent that noncontingent subjects were not aware of being lied to (as they should not have been in the present research), positive noncontingent subjects would have made internal attributions just as strongly as the positive contingent, and would therefore not be likely to be aware of noncontingency. People in the negative outcomes condition (where the accent is on "misses") would make external attributions. Noncontingent negative subjects, therefore, might be more receptive to the noncontingency, and likelier to be aware of it than noncontingent positive subjects.

One goal of the present research was to find out how helpless noncontingent subjects felt during pretreatment, how aware they were of response/outcome independence, and in what ways their attributions differed from those of contingent subjects.

The stable-unstable dimension refers to the relative permanence associated with an attribution; environmental events can be attributed to causes that are either stable or variable. Of the five influences on performance mentioned above, ability is a relatively stable attribution, whereas luck and effort are relatively variable. Since it has been established (e.g. Weiner, Nierenberg and Goldstein, 1976) that stability of attributions can determine the extent of the influence of past outcomes on future expectancies, it seems likely that the more attributions made to stable causes (e.g. ability) the more expectations will shift in the direction of what the outcomes have been. In our experiment, that would mean a greater performance decrement for noncontingent subjects who make ability attributions than other attributions.

The specific/general dimension of an attribution supposedly can predict the range of future tasks that will be affected by the expectancies developed in pretraining (Abramson et al. 1978; Miller and Norman, 1979). If a person attributes poor performance to poor motor coordination, for example, then expectations for performance on cognitive problems may not be very much affected. A generalized "nervousness on tests", however, might contribute to an expectation of poor performance in general; learned helplessness in a wide variety of laboratory situations might then follow. In order to examine this relationship, our questionnaire asked the subjects to rate, on a scale from 1 to 7, how nervous they generally are on tests of any kind. Being "very nervous" was expected to maximize learned helplessness.

Abramson et al. (1978) and Miller and Norman (1979) speculated that the subjective importance of a particular outcome has a bearing on whether or not learned helplessness develops. Although initial piloting had not yielded evidence indicating that subjective importance influenced performance, the questionnaire asked subjects to rate on a scale from 1 to 7 how important they feel it is to do well on laboratory tasks. No correlation was predicted for noncontingent subjects between importance and anagram performance.

In order to evaluate changes in emotions which subjects may have been experiencing, and which may have differentiated groups, anxiety, depression and hostility were measured, using the Multiple Affect Adjective Check List (Zuckerman and Lubin, 1965) at different points in the experiment.

Since personal responsibility was presumably induced in all experimental subjects, the expectation was that the kind of helplessness noncontingent subjects would experience would be personal helplessness, with the concomitant performance debilitation and depression predicted by Abramson et al. (1978).

At least this was the expectation with regard to noncontingent negative subjects. Intuitively, it seemed less likely that positive outcome noncontingent subjects (getting goodies without bringing them about by their own actions) would become saddened over what was happening to them. Nor did Griffith find increased depression among noncontingent success subjects, it will be recalled. We could not predict what the cognitions or impressions might be among these subjects. It is an interesting empirical question which the present research attempted to get at.

Hypotheses

Test task performance (anagrams)

The bulk of the evidence encouraged the prediction that subjects in noncontingent conditions would perform more poorly on the anagrams test than would control subjects. It was also predicted that the effect would hold for both noncontingently punished and noncontingently rewarded subjects. Both groups would be more debilitated than control subjects on the test task, and to an equal degree. Learned helplessness would thus be demonstrated cross-modally for both noncontingent groups.

As far as the learned industriousness effect is concerned, only Benson and Kennelly (1976) and Eisenberger and his associates (1976; 1977, experiment 2) showed this outcome. Most researchers have not (e.g. Hiroto, 1974; Hiroto and Seligman, 1975; Gampel, 1976; Eisenberger et al., 1977, experiment 3; Griffith, 1977). Since, in the present research, the pretreatment task was so different from the test task, a minimum of practice effects were to be expected. Therefore it was predicted that the contingent groups would not differ significantly from the control group on the test task. Learned industriousness would thus not be in evidence.

It follows from the above that performance decrement was likely to be greater for noncontingent subjects than for contingent subjects, and for positive and negative groups taken separately as well (i.e. comparing noncontingent with contingent groups for both negative and positive conditions).

It was expected, based on the speculations of Abramson et al. (1978) and of Miller and Norman (1979), that test task debilitation would be greatest for noncontingent subjects whose attributions are internal, stable, and general. In other words, noncontingent subjects who allocate responsibility for their outcomes more to ability than to the other factors were predicted to show more performance decrement on the anagrams task.

It was also anticipated that among noncontingent subjects poor anagram performance would be correlated with generalized test nervousness, but not with how important the task was considered to be.

Feelings of helplessness

Researchers investigating the subjective experience of helplessness or uncontrollability have generally found that it has been greater for subjects receiving pretreatment outcomes noncontingently rather than contingently (e.g. Benson and Kennelly, 1976; Hiroto and Seligman, 1975; Cohen et al., 1976; Roth and Kubal, 1975). However, in the present research, positive noncontingent subjects, expected to remain unaware of the noncontingency, were likely to feel no more helpless than contingent subjects (which was what Griffith, 1977, found). Noncontingent negative subjects, it was anticipated, would acknowledge feeling more helpless and would be more aware of noncontingency than people in any other group.

Attributions and affective responses

With regard to attributions made for one's performance, Weiner's attribution theory (e.g. Weiner et al., 1972) predicts that subjects who are successful make more attributions for their success to effort and to ability than to luck and to task difficulty. Since several researchers (e.g. Griffith, 1977; Hiroto and Seligman, 1975; Roth and Kubal, 1975) found contingent subjects experienced greater success (ability to solve) during pretreatment than did noncontingent subjects, it seemed likely that here too contingent subjects would feel successful, and that they would make more attributions to both ability and effort than to luck, task difficulty, or experimenter control. Noncontincent positive subjects would also feel successful and make ability and effort attributions. Negative noncontingent subjects would make more attributions to luck, task difficulty and experimenter control than to ability or effort.

Concerning emotional responses elicited during the experimental procedure, Seligman (1975) proposed that learned helplessness may represent a model for reactive depression. Increases in depression have been shown to be a function of uncontrollable aversive stimulation (Gatchel et al., 1975; Miller and Seligman, 1975). Gatchel et al., as a matter of fact, found increased anxiety and hostility as well among their noncontingent subjects. In the present research, the same emotional patterns among negative noncontingent subjects were anticipated.

With respect to the positive noncontingent subjects, however, much remained unpredictable. It will be remembered that Griffith's (1977) noncontingent success group felt no less able to solve their problems, and believed no less that they were solvable, than did the contingent (solvable) group. Particular kinds of attributions may have been at work. It was anticipated that negative noncontingent subjects would differ from positive noncontingent in some aspects of their cognitive functioning. In addition to differential attributions accounting for their performance (i.e. luck, ability, etc.) emotional responses were expected to differ as well, but in ways which it was not possible to predict.

Summary of Hypotheses

A. Test task performance (anagrams)

1. Worse performance for noncontingent subjects than for control subjects.

2. Worse performance for negative noncontingent subjects than for control subjects.

3. Worse performance for positive noncontingent subjects than for control subjects.

4. No performance difference between positive noncontingent and negative noncontingent groups.

5. No performance difference between contingent and control groups.

6. No performance difference between negative contingent and control groups.

7. No performance difference between positive contingent and control groups.

8. Worse performance for noncontingent subjects than for contingent.

9. Worse performance for negative noncontingent subjects than for negative contingent.

10. Worse performance for positive noncontingent subjects than for positive contingent.

11. Among noncontingent subjects, worse performance for those who make ability attributions than other attributions.

12. Among noncontingent subjects, poorer performance for subjects high on generalized test nervousness.

13. Among noncontingent subjects, no effect on performance of how important the task is considered to be.

B. Feelings of helplessness

1. Greater feelings of helplessness among negative noncontingent subjects than among other subjects.

2. Greater awareness of noncontingency among negative noncontingent subjects than among other subjects.

C. Attributions and affective responses

1. Contingent subjects, as compared to negative noncontingent, will attribute a greater proportion of responsibility for their target-shoot performance to ability and effort and a smaller proportion to luck, task difficulty, and experimenter control.

2. Positive noncontingent subjects, as compared to negative noncontingent, will likewise attribute a greater proportion of responsibility for their target-shoot performance to ability and effort, and a smaller proportion to luck, task difficulty, and experimenter control.

3. Negative noncontingent subjects, as compared to contingent and to positive noncontingent, will attribute a greater proportion of responsibility for their target-shoot performance to luck, task difficulty and experimenter control, and a smaller proportion to ability and effort.

4. More depression, hostility and anxiety among negative noncontingent subjects than among other subjects.

5. Unspecifiable differences between negative noncontingent and positive noncontingent subjects, with regard to attributions and/or emotional responses.

METHOD

Design

The design of the study in part followed that used by Hiroto and Seligman (1975) in the instrumental-cognitive portion of their experiment. A two-phase study was carried out, consisting of pretreatment and testing phases. The pretreatment task was instrumental for all subjects, and involved the use of a target apparatus. The subject aimed a small light gun at a target and attempted to hit the bullseye with a beam of light; a photoreceptor cell had been placed at the bullseye. Depending on the experimental condition of the subject, either a "hit" or a "miss" activated a tone.

In this pretreatment phase, half the subjects received a negative (punishment) outcome, and the other half received a positive (reward) outcome. Within each of these two conditions, the outcomes were either contingent or noncontingent on subjects' responses.

When negative contingent (NC) subjects missed the target, the tone sounded (to indicate failure). In addition, the experimenter said "That was a miss" the first few times it happened. Positive contingent (PC) subjects, on the other hand, were rewarded for success rather than punished for failure. That is, they received a positive (reward) outcome when they hit the bullseye. The tone sounded (to indicate a "hit"), and the experimenter said "That was a hit" the first few times it happened.

The performance of each contingent subject was recorded so that yoking could take place. A subject in either noncontingent group (positive or negative, i.e. reward or punishment) was yoked to a contingent subject (positive or negative). A yoked noncontingent subject received feedback consisting of the same schedule of hits and misses as the person he or she was yoked to, irrespective of his or her actual performance.

Thus, there were four pretreatment groups: two types of feedback (positive or negative) and two types of contingency within each feedback condition (contingent and yoked noncontingent), as follows:

	Negative (Punishment)	Positive (Reward)
Contingent	NC	PC
Noncontingent	NN	PN

There was, in addition, a control group which was not given any pretreatment, but went directly to the test task.

This test task, the second (cognitive) phase of the experiment, was the same for everyone. Subjects were asked to work on anagrams similar to those used in previous learned helplessness experiments (e.g. Hiroto and Seligman, 1975; Benson and Kennelly, 1976; Griffith, 1977). There were three dependent measures: (1) total time to solve the anagrams; (2) number of failures; and (3) number of trials to learn the anagram pattern.

The Multiple Affect Adjective Check List (MAACL) was administered twice to all experimental subjects. Half the experimental subjects in each group did the MAACL before the experiment, the other half after the pretreatment.

After completing the anagram task, all subjects, including the control group, did the MAACL, filled out a questionnaire, and were debriefed.

Subjects

Subjects were recruited from the Brooklyn College subject pool, which includes all students in the introductory psychology course. Students enrolled in this course are required to participate in two hours of experimentation. This experiment took one hour. Subjects volunteering for this study arrived at the lab one at a time, where they were randomly assigned to one of the five groups (four pretreatment and one control). Equal numbers of male and female subjects were used, 16 of each in each cell, for a total of 160 subjects.

Apparatus

The instrumental pretreatment task was to hit the bull-seye of a target with the beam of light from a light gun. The light gun consisted of a penlite flashlight to which had been attached various elements -- a wooden handle, a trigger and a metal tube -- which gave the appearance of a small hand gun. The beam was concentrated by an iris diaphragm at the end of the barrel. The room was fully illuminated, and the light beam could not be seen by subjects. The target was about a foot in diameter, and consisted of concentric flat black and white circles roughly one and a half inches wide. In the center of the target was placed a photosensitive receptor cell. This photoreceptor cell was hooked up electronically in such a way that, depending on whether the subject was in the positive or negative condition, a hit either triggered a 1-second tone or triggered a silence (that is, kept the tone from sounding), after a constant 2-second period following the onset of a cue light, which was the signal for a trial. In the positive condition, if a "hit" occurred during the 2-second period following the lighting of the cue light, the tone sounded at the end of the period. A "miss" produced silence. In the negative condition, if a "hit" occurred during the 2-second period following the onset of the cue light, there was silence at the end of the period. Otherwise, the tone sounded. The target, mounted on a 6-inch base, was placed on a table 28 inches high. The bullseye was roughly at eye level when the subject was seated.

The relay rack and all the programming equipment was housed in a separate room, so that subjects heard no noises nor could they get any cues from the equipment.

In phase two, the anagrams were printed in 1/2 inch letters on unlined 3 x 5 index cards. There were 20 anagrams of 5 letters each. Other materials given to all subjects were the Multiple Affect Adjective Check List (MAACL) (Zuckerman and Lubin, 1965) and a questionnaire. (Copies of these materials may be found in the Appendix).

Procedure

Subjects arrived for the experiment one at a time, were greeted by the experimenter, and were assigned randomly to one of five groups (four experimental and one control). Half the experimental subjects were asked to fill out the Multiple Affect Adjective Check List (MAACL) immediately. The other half proceeded directly to the target task (and filled out the MAACL at the conclusion of the target-shoot). Subjects were seated in an armless chair five feet from the target, were given the light gun, and were instructed as follows:

> We have here a light gun and a target with a photoreceptor cell right in the center, at the bullseye. The idea is to hit the photosensitive cell with the beam of light from this gun each time an orange light comes on up here (demonstrated the cue light). The orange light comes on for two seconds. While it's on, you're to aim the gun and pull the trigger just once.

(To positive subjects):

> If you hit the bullseye with the beam of light, a tone will sound to indicate you've hit. Whenever you hear that tone, it means you got a hit. If you don't hear the tone it means you missed.

(To negative subjects):

> If you don't hit the bullseye with the beam of light, a tone will sound to indicate you've missed. Whenever you hear that tone, it means you've missed. If you don't hear the tone, it means you got a hit.

(To all):

> In between trials, you may rest the gun in your lap or keep your elbow bent and the gun up like this (experimenter demonstrated). Just don't keep it in shooting position. Then, when the orange light comes on, you have two seconds to aim and pull the trigger and try to hit the bullseye. You can pull the trigger now just to see how it feels.
>
> There will a total of 100 trials, but we will stop for a brief rest after every 25.
>
> Most people find they have to try many different positions of the gun before they get a hit.

(It had been found in piloting that some people rigidly stick to one inaccurate aiming position and get no hits.

This last instruction was designed to discourage that behavior.)

Subjects were then given 100 trials. Each trial consisted of a 2-second period during which the orange light was on. During the 2 seconds, subjects aimed the light gun and pulled the trigger attempting to hit the bullseye with the beam of light.

(Contingent subjects):

At the end of 2 seconds, a 1-second tone sounded if a subject in the negative condition had missed the target or if a positive subject had hit it. Negative subjects who hit the target -- and positive subjects who did not -- received no tone at the end of the 2-second period. A five-second intertrial interval preceded each trial, so that trials occurred at 8-second intervals. Thus there was a total of roughly 15 minutes of target-shooting, including the brief rests after every 25 trials.

Subjects who hit the target fewer than 5 times during the first 25 trials were instructed to move their chairs four inches closer to the target. Despite this move, some subjects continued to have trouble getting hits ("trouble" being defined as fewer than 5 hits in the second 25 trials). In these cases, the target on its base was moved four inches closer to the subject. Most of the time these moves were sufficient to enable people to begin to get hits. In the infrequent cases in which subjects did not meet a minimum ultimate criterion of 15 hits out of the 100 trials, their protocols were considered invalid and were discarded. These subjects were terminated and debriefed.

(Noncontingent subjects):

The procedure was identical for noncontingent subjects with the exception that a subject assigned to either noncontingent condition (positive or negative) was given a schedule of hits and misses according to the performance of the contingent subject he or she had been linked to (by the experimenter) at the start of the run. Unknown to these noncontingent subjects, in other words, their schedule of hits and misses had no relationship to their own performance but was identical to that of the contingent person they were yoked to. If this contingent person had been asked to move his or her chair closer after 25 trials (for lack of hits), so was the yoked noncontingent subject. Occasionally the yoking was inexact; that is, if a contingent subject got a hit on trial number 38, for example, the yoked noncontingent subject might be given the hit on trial number 39 or 40, at the discretion of the experimenter. This was done so as to minimize the chances of a subject becoming suspicious that feedback was noncontingent. That is, if the person happened to forget to pull the trigger on trial 38 or aimed idly at the ceiling, the experimenter was careful not to give feedback indicating a hit on that trial, but delayed the hit feedback until it was feasible to give it. Subjects had no source of information about their success or failure on the task except for the feedback signal, that is, a tone or no-tone.

At the end of the 100 trials, subjects who had not previously filled out the MAACL did so at this point.

(Anagrams):

All subjects then did the anagrams task. The instructions were as follows:

> I see we still have some time left. There is something else I would like you to do. We're trying to get some standardization data on some anagrams for a future research project. So that is what I would like you to do now. As you probably know, anagrams are words with the letters scrambled. The idea is for you to unscramble the letters so they form a common English word. There could be a pattern or a principle by which to solve the anagrams, but that's up to you to figure out if you can. Look at these cards one at a time and tell me the word as soon as you see what it is.

Twenty 5-letter anagrams were presented on 3 x 5 cards to subjects. The anagrams all had the order 3-4-5-2-1 (e.g. TERAW = water; GARUS = sugar). Piloting had suggested that this pattern presented an appropriate level of difficulty for the students in our sample, although it's an easier pattern than that used in some learned helplessness research (e.g. Hiroto and Seligman, 1975). Subjects were given a maximum of 100 seconds to solve each anagram, and were told to go on to the next one at the end of 100 seconds if they had not gotten it. Any anagram not solved within that time was counted a failure, a "miss". By the end of the 20 anagrams, it was usually clear whether or not a subject had caught on to the anagram pattern. When it was not clear, the experimenter inquired.

Subjects were then asked to fill out a questionnaire (see Appendix), and to do the MAACL a second time. Debriefing ended the experiment.

(Control Group):

One-fifth of the subjects were randomly assigned to be in the control group. They did not receive any pretreatment, were told the target-shooting apparatus was not working properly, and went directly to the anagrams task. They received the same anagrams instructions as the other subjects, and subsequently filled out the questionnaire (the last two questions only, since the first three dealt with the target-shoot) and the MAACL. They were then debriefed.

RESULTS

The results of the experiment can be subdivided into several parts, corresponding to the kinds of effects that were predicted:

1. Performance on anagrams, the dependent behavioral measure

2. Feelings of helplessness and awareness of noncontingency

3. Attributions and affective responses

Anagram Performance

There were three measures of anagram performance which together comprised the dependent measure. They were (a) latency, the total time (in seconds) to solve all 20 anagrams; (b) misses, the number of anagrams subjects failed to name correctly within 100 seconds; and (c) trials to criterion, the number of anagrams it took for the subject to catch on to the pattern. Performance on these measures is shown in Tables 1, 2, and 3.

Table 1

Anagram Performance - Total Latency, in seconds

		N	Mean	S.D.
Group 1	Negative Contingent (NC)	32	250.53	283.39
Group 2	Negative Noncontingent (NN)	32	385.25	322.66
Group 3	Positive Contingent (PC)	32	214.31	200.24
Group 4	Positive Noncontingent (PN)	32	355.41	366.51
Group 5	Control	32	206.62	170.44
		160		

Table 2

Anagram Performance - Number Missed

		N	Mean	S.D.
Group 1	Negative Contingent (NC)	32	1.09	2.12
Group 2	Negative Noncontingent (NN)	32	1.53	2.21
Group 3	Positive Contingent (PC)	32	0.69	1.42
Group 4	Positive Noncontingent (PN)	32	1.78	3.02
Group 5	Control	32	0.66	1.36
		160		

Table 3

Anagram Performance - Trials to Criterion

		N	Mean	S.D.
Group 1	Negative Contingent (NC)	32	14.72	6.81
Group 2	Negative Noncontingent (NN)	32	17.78	3.93
Group 3	Positive Contingent (PC)	32	12.66	6.40
Group 4	Positive Noncontingent (PN)	32	16.81	5.63
Group 5	Control	32	13.81	7.07
		160		

Bar graphs representing these results are shown in Figures 1 to 9, as follows:

Figure 1 - Total Latency, total sample

Figure 2 - Total Latency, negative and control subjects

Figure 3 - Total Latency, positive and control subjects

Figure 4 - Number Missed, total sample

Figure 5 - Number Missed, negative and control subjects

Figure 6 - Number Missed, positive and control subjects

Figure 7 - Trials to Criterion, total sample

Figure 8 - Trials to Criterion, negative and control subjects

Figure 9 - Trials to Criterion, positive and control subjects

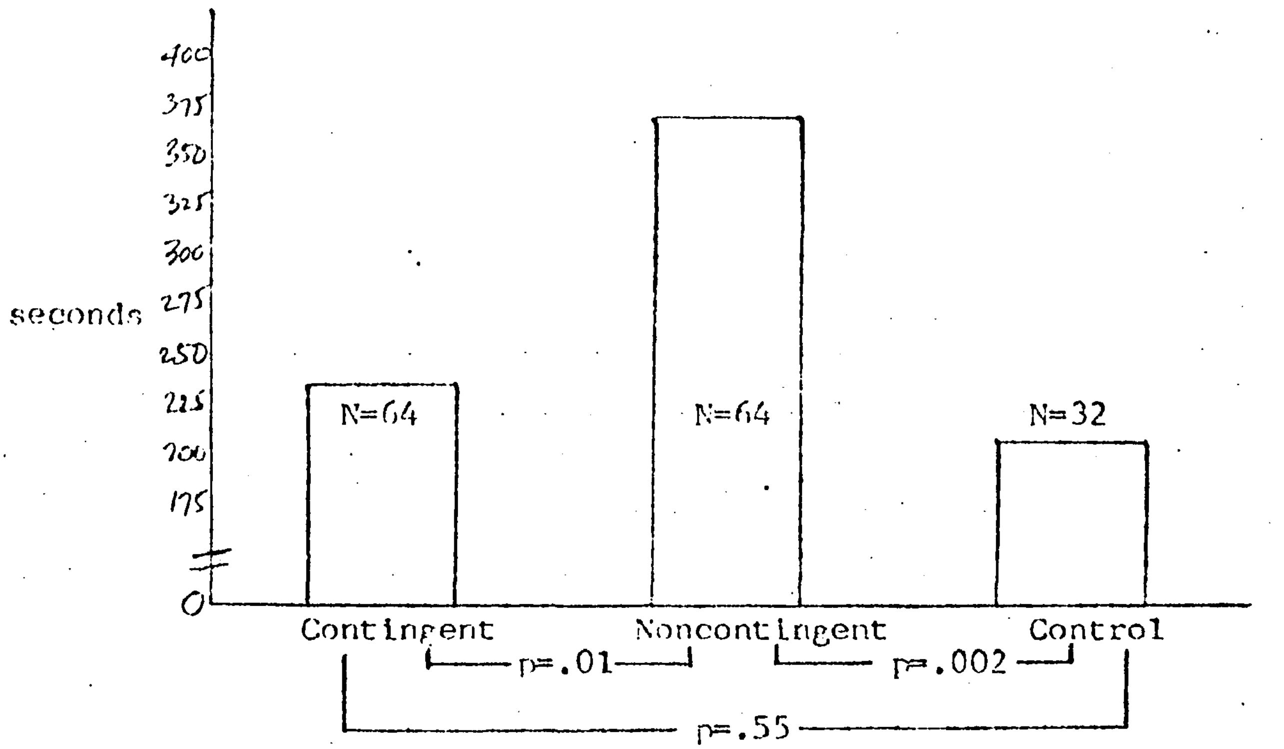

Figure 1 - Total Latency, total sample

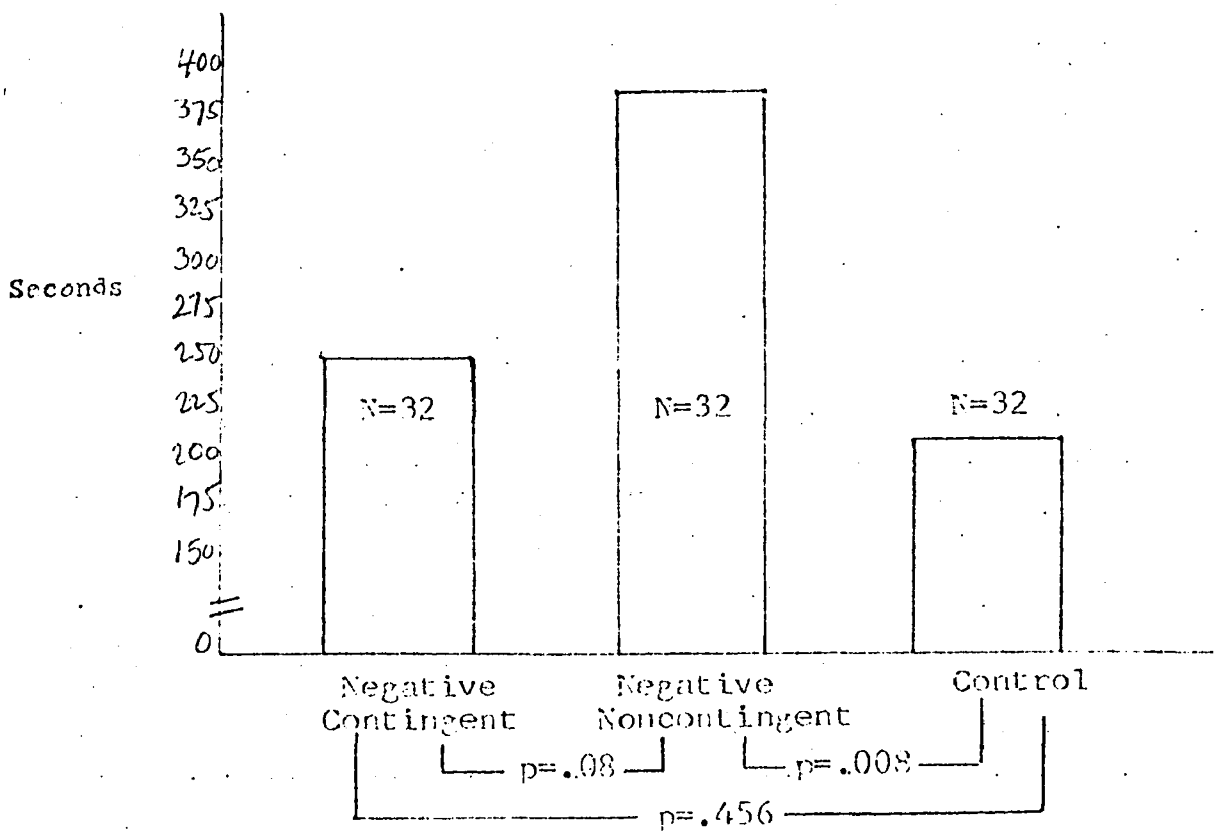

Figure 2 - Total Latency, negative and control subjects

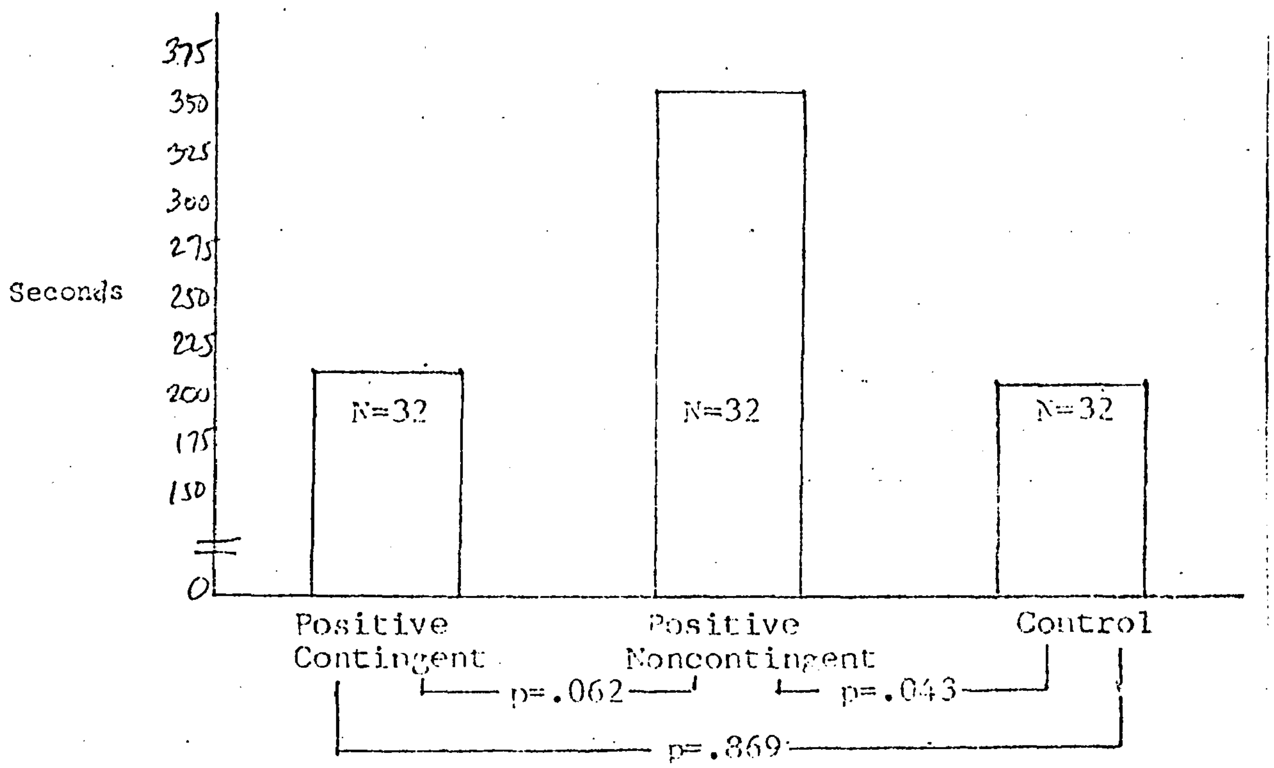

Figure 3 - Total Latency, positive and control subjects

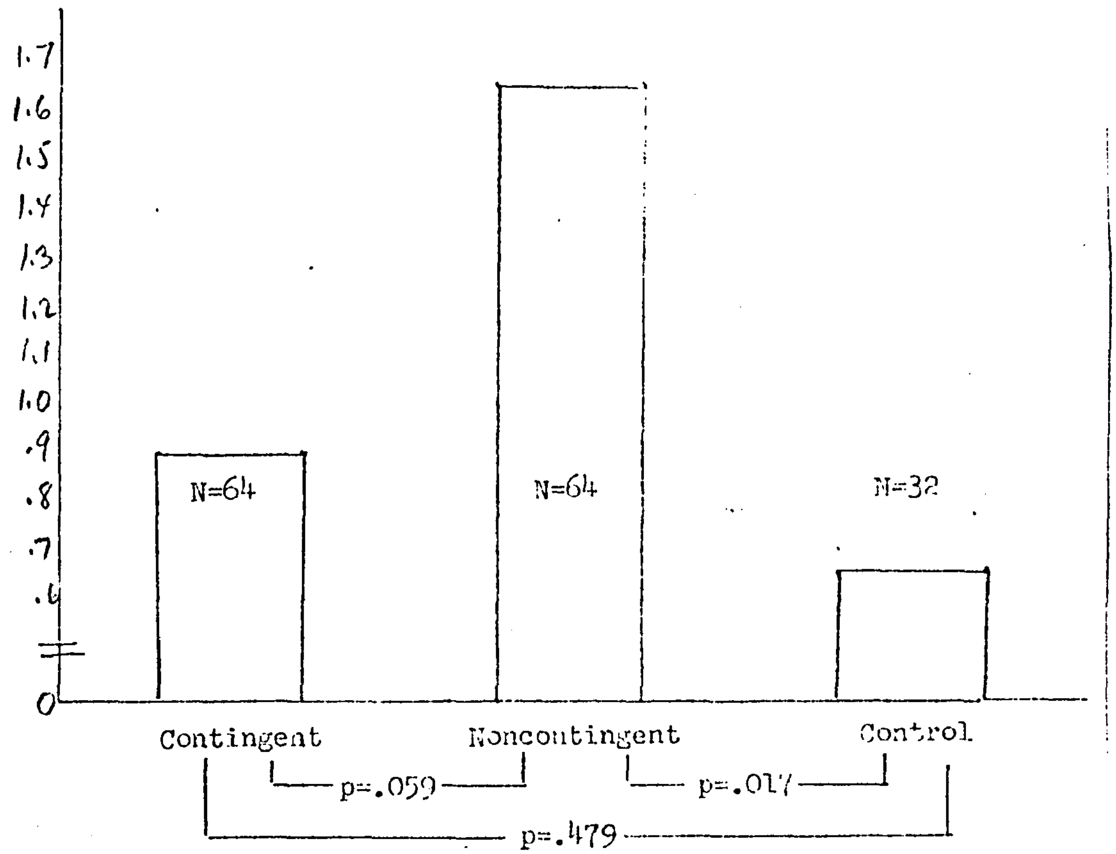

Figure 4 - Number Missed, total sample

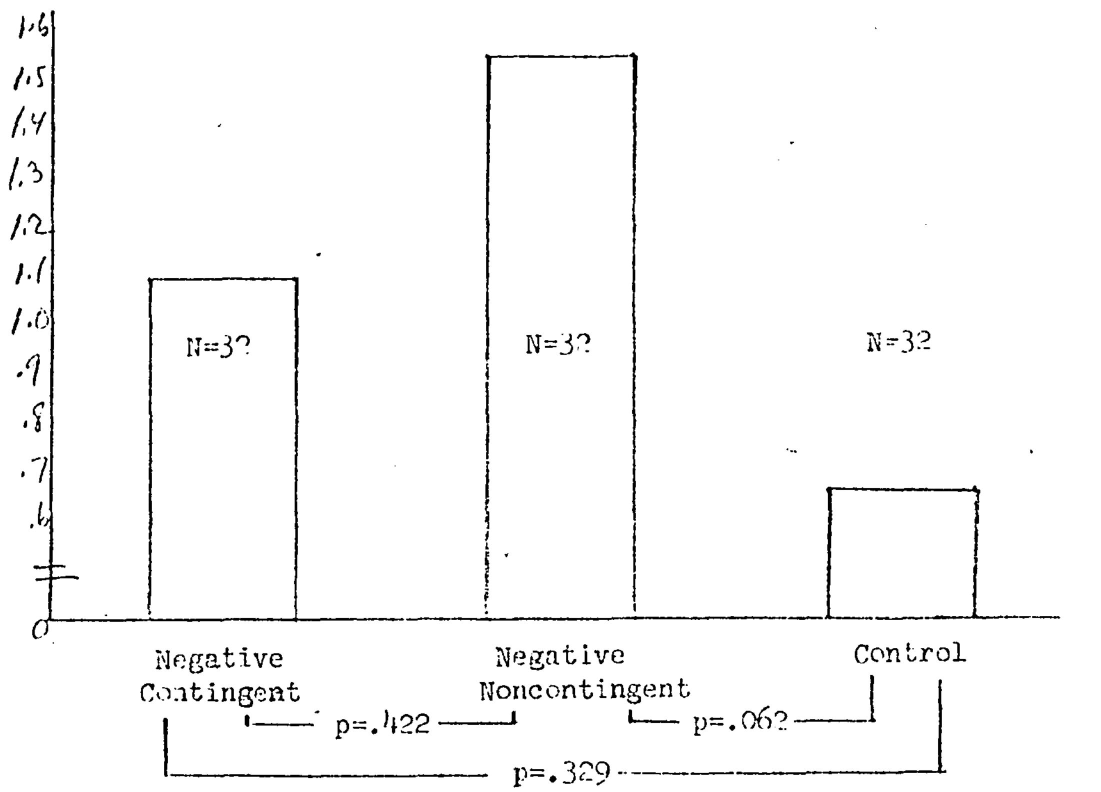

Figure 5 - Number Missed, negative and control subjects

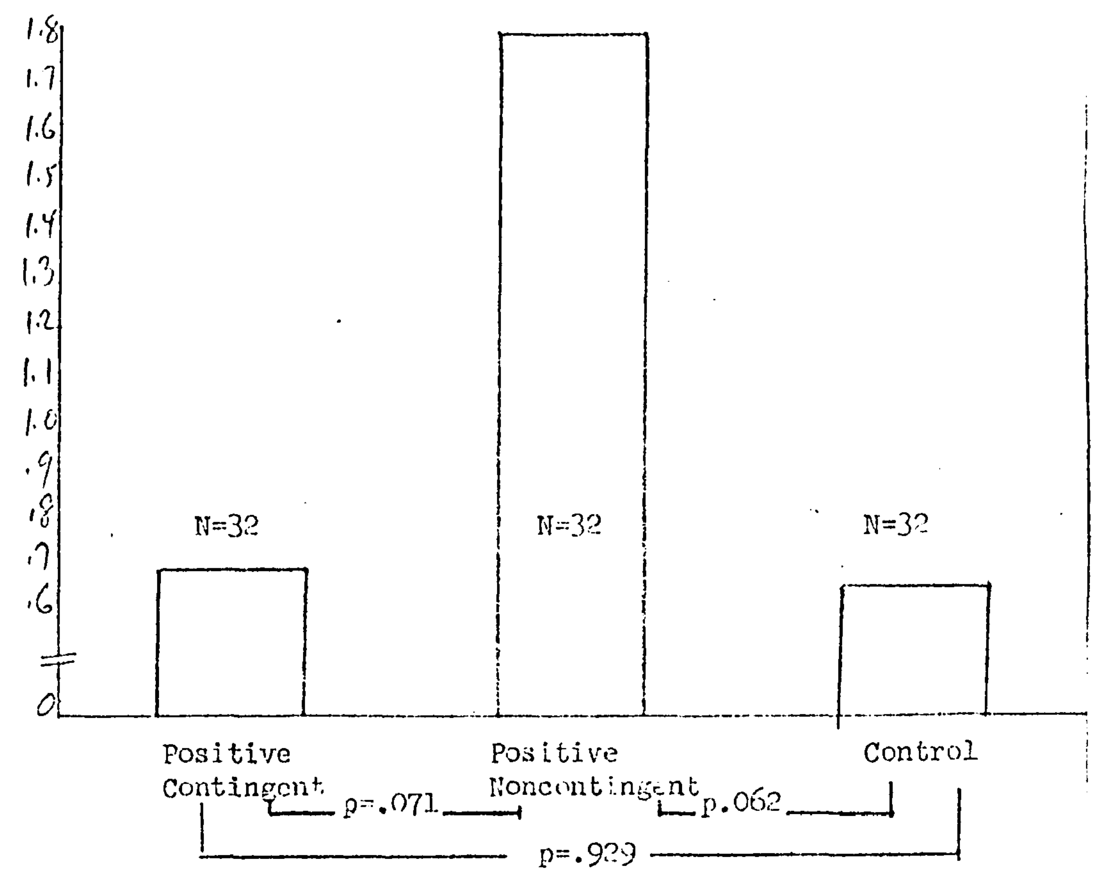

Figure 6 - Number Missed, positive and control subjects

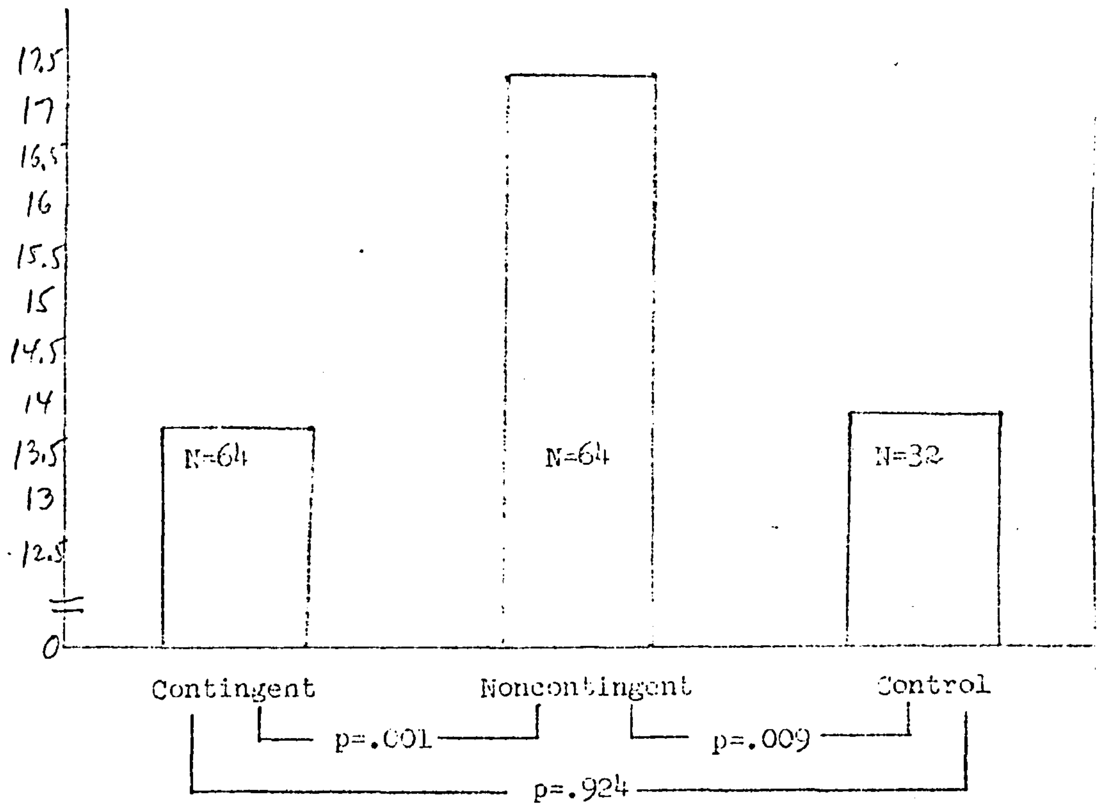

Figure 7 - Trials to Criterion, total sample

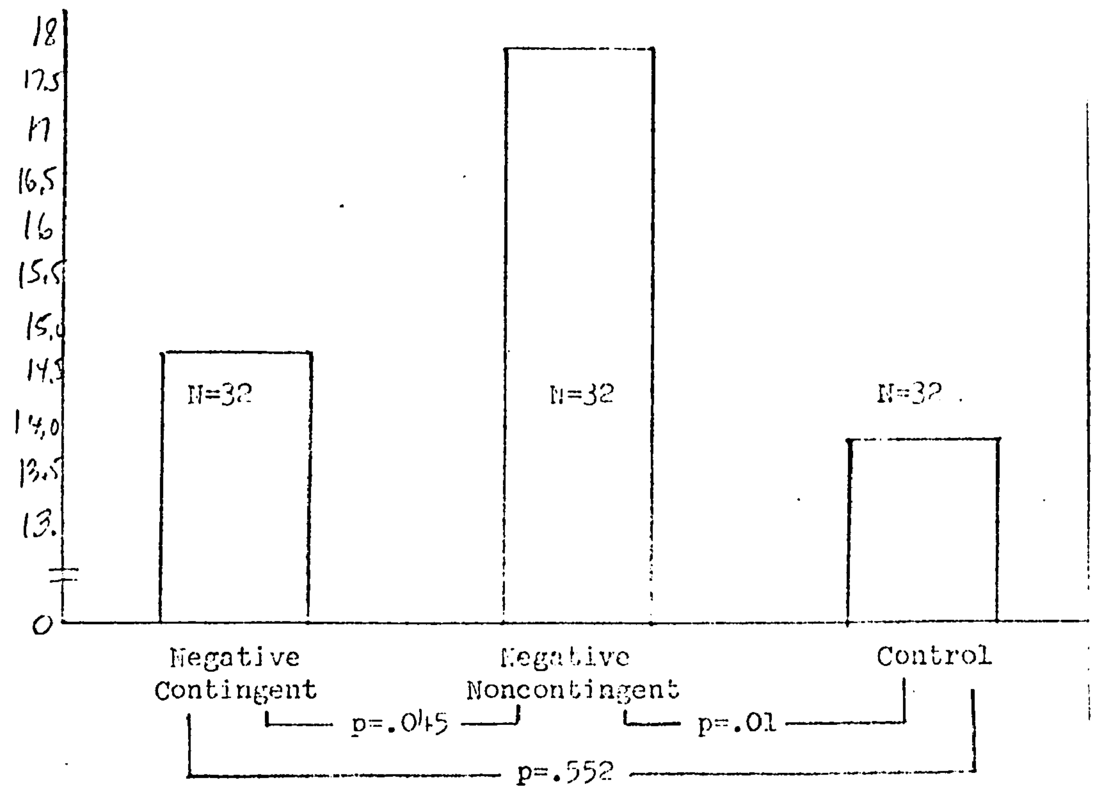

Figure 8 - Trials to Criterion, negative and control subjects

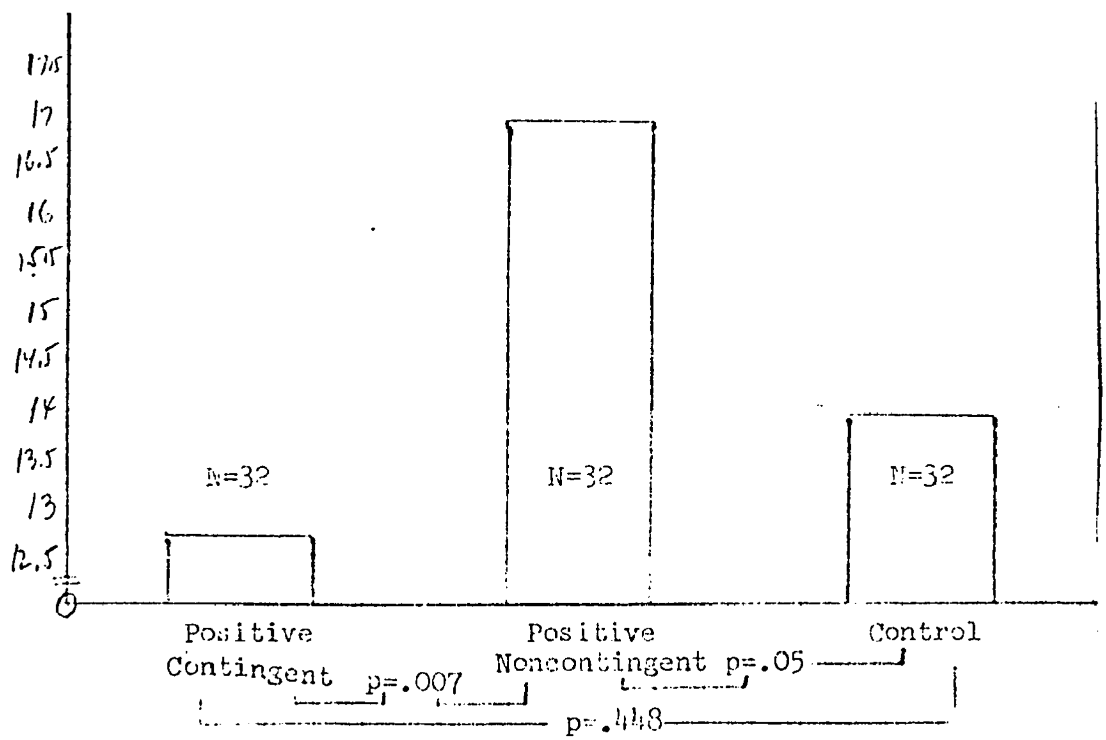

Figure 9 - Trials to Criterion, positive and control subjects

The differences among the groups were evaluated with a one-way analysis of variance. For two of the three dependent measures the overall Fs were significant (p=.0272 for Total Latency and p=.005 for Trials to Criterion). The F ratio for Number Missed approached statistical significance (p=.1327). Overall Fs were not important in this study, however, since the research required the use of preplanned non-orthogonal comparisons; a priori contrasts were used to test specific differences. The results of these comparisons are shown in Tables 4, 5, 6, and 7.

Table 4 presents comparisons on all three dependent measures between noncontingent and control groups on anagram performance, the learned helplessness effect. The first of the trio of comparisons (corresponding to hypothesis A1) looks at total noncontingent versus control groups. The next two comparisons (hypotheses A2 and A3) break down the total noncontingent group into negative and positive groups respectively. Table 5 compares the two noncontinent groups (positive and negative) on all three dependent measures (hypothesis A4). The learned industriousness -- or facilitation -- comparisons (contingent vs. control groups, hypotheses A5 - A7) are presented in Table 6. The comparisons presented in Table 7, contingent versus noncontingent groups, are not concerned with either helplessness or facilitation, but are included for the sake of completeness. These comparisons test hypotheses A8 to A10.

Table 4

t-Tests Comparing Noncontingent and Control Groups Performance on Anagrams, Learned Helplessness

		Hypothesis A1		Hypothesis A2		Hypothesis A3	
		NN & PN	vs. Control	NN vs.	Control	PN vs.	Control
		N=64	N=32	N=32	N=32	N=32	N=32
TOTAL LATENCY	t Value	-3.11		-2.77		-2.08	
	D.F. *	92.0		47.1		43.8	
	Prob.	.002		.008		.043	
NUMBER MISSED	t Value	-2.44		-1.90		-1.92	
	D.F. *	87.8		51.4		43.0	
	Prob.	.017		.062		.062	
TRIALS TO CRITERION	t Value	-2.65		-2.51		-1.98	
	D.F. *	155		155		155	
	Prob.	.009		.01		.05	

* Using Cochran's C to test homogeneity of variance, it was found that, for Total Latency and Number Missed, the group variances were sufficiently different to require the use of separate variance estimates. The degrees of freedom for these measures were therefore fractional, as shown. Cochran's C showed sufficient homogeneity of variance on the Trials to Criterion measure to justify a pooled variance estimate and 155 degrees of freedom.

As far as learned helplessness is concerned, the results shown in Table 4 indicate that anagram performance was significantly worse for the noncontingent groups than for the control groups on all three dependent measures for the total noncontingent group (hypothesis A1). For both the negative noncontingent (hypothesis A2) and the positive noncontingent (hypothesis A3) groups, performance was worse on two of the three measures as compared with the control group. The difference between the groups just misses significance on Number Missed (p=.062 in both cases). Thus, learned helplessness has been demonstrated for positive noncontingent subjects as well as for the negative noncontingent group, as in previous research (e.g. Hiroto and Seligman, 1975), and for the total noncontingent population as well (combining positive and negative noncontingent groups).

Table 5

t-Tests Comparing Positive and Negative Noncontingent Groups Performance on Anagrams

	Hypothesis A4 PN vs. NN N=32 N=32	
TOTAL LATENCY	t Value	-0.35
	D.F. *	61.0
	Prob.	.731
NUMBER MISSED	t Value	.377
	D.F. *	56.8
	Prob.	.707
TRIALS TO CRITERION	t Value	-0.64
	D.F. *	155
	Prob.	.524

* Using Cochran's C to test homogeneity of variance, it was found that, for Total Latency and Number Missed, the group variances were sufficiently different to require the use of separate variance estimates. The degrees of freedom for these measures were therefore fractional, as shown. Cochran's C showed sufficient homogeneity of variance on the Trials to Criterion measure to justify a pooled variance estimate and 155 degrees of freedom.

With respect to the two noncontingent groups, it was found, as predicted in hypothesis A4, and as shown in Table 5, that performance decrement was as great for the positive noncontingent as for the negative noncontingent group, again confirming that debilitation following a helplessness manipulation results from the noncontingency of the situation, and not from its aversive punishment context.

A priori contrasts were further used to test for learned industriousness and for the contingent/noncontingent differences. These further contrasts are not independent of the previous contrasts; therefore, statistically, they are not as rigorous as the first ones. However, such a small number of additional comparisons was involved that the trustworthiness of the results is not likely to have been seriously affected.

Table 6

t-Tests Comparing Contingent and Control Groups Performance on Anagrams, Learned Industriousness

		Hypothesis A5		Hypothesis A6		Hypothesis A7	
		NC & PC vs.	Control	NC vs.	Control	PC vs.	Control
		N=64	N=32	N=32	N=32	N=32	N=32
TOTAL LATENCY	t Value	-0.60		-.75		-.16	
	D.F. *	80.5		50.8		60.5	
	Prob.	.55		.456		.869	
NUMBER MISSED	t Value	-0.71		-.98		-.09	
	D.F. *	76.0		52.9		61.9	
	Prob.	.479		.329		.929	
TRIALS TO CRITERION	t Value	.09		-.60		.76	
	D.F. *	155		155		155	
	Prob.	.924		.552		.448	

* Using Cochran's C to test homogeneity of variance, it was found that, for Total Latency and Number Missed, the group variances were sufficiently different to require the use of separate variance estimates. The degrees of freedom for these measures were therefore fractional, as shown. Cochran's C showed sufficient homogeneity of variance on the Trials to Criterion measure to justify a pooled variance estimate and 155 degrees of freedom.

As predicted in hypotheses A5, A6, and A7, and shown in Table 6, learned industriousness, or the facilitation effect postulated by some researchers (e.g. Eisenberger et al., 1977) is not evident in these results. In 5 out of 6 cases, in fact (comparing the means of positive contingent with control and negative contingent with control on each of three measures, Tables 1-3), anagram performance was slightly worse for contingent subjects than for control subjects, although not at a level of statistical significance.

What we are saying here concerning learned industriousness (and previously, concerning the two noncontingent groups, hypothesis A4) is that there are no differences between specific experimental groups. We are thus "accepting" the null hypothesis. Normally, there are two methods of legitimately doing this. One is to use a statistical power analysis (e.g. Cohen, 1969). The other involves an informal inspection of the data, which, in this case, would show that the power of this experiment was high. We made nine predictions in which we rejected the null hypothesis with respect to learned helplessness (see Table 4). Of the 9, seven were highly significant, and the remaining two were marginally significant ($p=.062$). We would never have gotten these results if the power of the experiment were low. We thus feel justified in "accepting" the null hypothesis when we find no differences between experimental groups.

Table 7 indicates that of the nine tests comparing noncontingent and contingent groups, four were highly significant ($p<.05$), and four more were close to significant ($p<.10$), indicating generally worse performance for noncontingent than contingent groups, as was predicted (hypotheses A8 to A10).

Table 7

t-Tests Comparing Contingent and Noncontingent Groups Performance on Anagrams

		Hypothesis A8: NN & PN vs. NC & PC (N=64, N=64)	Hypothesis A9: NN vs. NC (N=32, N=32)	Hypothesis A10: PN vs. PC (N=32, N=32)
TOTAL LATENCY	t Value	-2.60	-1.77	-1.91
	D.F. *	108.1	61.0	48.0
	Prob.	.01	.081	.062
NUMBER MISSED	t Value	-1.91	-0.81	-1.85
	D.F. *	99.3	61.9	44.1
	Prob.	.059	.422	.071
TRIALS TO CRITERION	t Value	-3.36	-2.02	-2.74
	D.F. *	155	155	155
	Prob.	.001	.045	.007

* Using Cochran's C to test homogeneity of variance, it was found that, for Total Latency and Number Missed, the group variances were sufficiently different to require the use of separate variance estimates. The degrees of freedom for these measures were therefore fractional, as shown. Cochran's C showed sufficient homogeneity of variance on the Trials to Criterion measure to justify a pooled variance estimate and 155 degrees of freedom.

The work of Abramson et al. (1978) and of Miller and Norman (1979) suggested that people whose attributions are internal, stable and general are most debilitated on test tasks. Accordingly, it was predicted (hypothesis A11) that noncontingent subjects who allocate responsibility for their outcomes mainly to their own ability would perform more poorly on the anagrams task.

In order to see whether or not this prediction was borne out, responses to question 3 on the questionnaire, which asked subjects to allocate responsibility for their target-shoot performance, were analyzed. Noncontingent subjects were divided into two groups: those who made ability attributions of 50% or more, and those who made ability attributions of under 50%. Scores on the three dependent measures were compared using t-tests to determine whether the groups differed significantly. These results are presented in Table 8.

Table 8
Anagram Performance of Noncontingent Subjects Making High Versus Low Attributions to Ability

TOTAL LATENCY

Attributions to Ability	N	Mean	S.D.	t Value	D.F.	Prob.
HIGH	9	444.0	401.82			
				.61	9.9	.558
LOW	55	358.27	334.92			

NUMBER MISSED

Attributions to Ability	N	Mean	S.D.	t Value	D.F.	Prob.
HIGH	9	2.0	2.55			
				.43	11.06	.673
LOW	55	1.6	2.66			

TRIALS TO CRITERION

Attributions to Ability	N	Mean	S.D.	t Value	D.F.	Prob.
HIGH	9	18.56	2.19			
				1.46	25.83	.157
LOW	55	17.09	5.13			

Of the 64 noncontingent subjects, 9 made ability attributions of 50% or greater, and 55 made ability attributions of less than 50%. The results shown in Table 8 indicate that although there were differences in performance in the predicted direction, these differences were not significant. Only the difference on the Trials to Criterion measure (18.56 vs. 17.09) approaches significance (p=.157). Making higher attributions to one's own ability than to anything else did not have an impact on anagram performance for these subjects.

Abramson et al. (1978) suggested that the specificity/ generality dimension of attributions has an influence on a person's expectations for future performance. Based on this notion, it was predicted (hypothesis A12) that among noncontingent subjects, being generally "nervous on tests of any kind" would increase the learned helplessness effect.

In order to look at this relationship, the noncontingent sample was divided into those who were "high nervous" on question 4 of the questionnaire (6-7 on a scale of 1-7) and those who were "low nervous" (1-3 on the nervousness scale).

Piloting had suggested it might be productive to look at males and females separately on this measure. A total of 15 noncontingent subjects, 9 males and 6 females, were low on nervousness. Twelve noncontingent people (4 males and 8 females) were at the "high nervous" end of the scale. Their scores on the three anagram measures are presented in Table 9.

An analysis of variance, summarized in Table 10, was made for these data.

As Table 10 indicates, no main effects were found for either nervousness or sex on any of the three dependent measures. However, a significant interaction effect was found, in which performance was better for males low in nervousness and females high in nervousness than for males high and females low on the nervousness scale. This interaction effect can be seen in the scores for all three dependent measures, but only for Total Latency does it reach statistical significance ($p=.029$). Hypothesis A12 was thus found to be true for male subjects only, not for females.

Table 9
Anagram Performance of High Nervous and Low Nervous Male and Female Noncontingent Subjects

	Males N	Males Mean	Males S.D.	Females N	Females Mean	Females S.D.
TOTAL LATENCY						
HIGH NERVOUS	4	410.25	291.62	8	223.0	149.74
LOW NERVOUS	9	274.67	187.77	6	484.83	257.74
NUMBER MISSED						
HIGH NERVOUS	4	2.25	2.22	8	0.75	.89
LOW NERVOUS	9	1.11	1.54	6	2.0	2.10
TRIALS TO CRITERION						
HIGH NERVOUS	4	18.25	2.36	8	16.0	7.43
LOW NERVOUS	9	17.44	5.36	6	20.0	0

Table 10

Summary of Analysis of Variance on Anagram Performance of Noncontingent Subjects, by Nervousness and by Sex

TOTAL LATENCY

		F	Prob.
MAIN EFFECTS			
	Nervousness	.986	.331
	Sex	.237	.631
INTERACTION		5.422	.029

NUMBER MISSED

		F	Prob.
MAIN EFFECTS			
	Nervousness	.078	.783
	Sex	.038	.846
INTERACTION		3.289	.083

TRIALS TO CRITERION

		F	Prob.
MAIN EFFECTS			
	Nervousness	.773	.388
	Sex	.059	.810
INTERACTION		1.285	.269

Although some researchers (e.g. Miller and Norman, 1979) have posited a relationship between how important a particular outcome is perceived to be and the development of learned helplessness, our preliminary pilot work had not turned up evidence of such a relationship. Hypothesis A13 reflected our expectation of no such relationship. To explore this question, subjects were asked (on question 5 of the questionnaire) to indicate how important, on a scale of 1 to 7, it is to do well on tasks such as they were doing that day in the lab.

To look at the relationship between responses on this question and anagram performance, the entire noncontingent sample was broken down into those for whom it was "very important" and those for whom it was not very important.

Again, the data were analyzed separately for males and females. A total of 18 noncontingent subjects (10 males and 8 females) checked off "low importance". Seventeen noncontingent subjects (9 male, 8 female) were on the high end of the scale. Their scores on the three anagram measures are presented in Table 11.

It can be seen that there was a tendency toward an interaction effect, with males high and females low in importance doing better on all three dependent measures. Analyses of variance, however, indicated these relaticnships were not statistically significant. Importance of the task had no significant influence on learned helplessness, as predicted in hypcthesis A13.

Table 11
Anagram Performance of High Importance and Low Importance Male and Female Noncontingent Subjects

TOTAL LATENCY

	MALES N	MALES Mean	MALES S.D.	FEMALES N	FEMALES Mean	FEMALES S.D.
HIGH IMPORTANCE	9	302.22	350.65	8	413.12	364.87
LOW IMPORTANCE	10	478.2	486.57	8	340.50	277.66

NUMBER MISSED

	MALES N	MALES Mean	MALES S.D.	FEMALES N	FEMALES Mean	FEMALES S.D.
HIGH IMPORTANCE	9	1.44	3.36	8	2.0	2.98
LOW IMPORTANCE	10	2.8	3.94	8	1.0	1.41

TRIALS TO CRITERION

	MALES N	MALES Mean	MALES S.D.	FEMALES N	FEMALES Mean	FEMALES S.D.
HIGH IMPORTANCE	9	15.89	6.15	8	19.0	2.83
LOW IMPORTANCE	10	17.40	4.22	8	17.87	4.36

Feelings of Helplessness

Question 1 of the questionnaire was analyzed in order to explore the ways in which the experimental groups differed in their subjective experience of helplessness. This question had asked "During the target-shoot, to what extent did you believe you could be successful?"

The scale of responses ranged from a low of 1 ("definitely not") to a high of 7 ("definitely yes"). It had been predicted (hypothesis B1) that the negative noncontingent group would manifest greater feelings of helplessness as expressed by lower scores on Question 1. Mean scores on this question are presented by group in Table 12.

Table 12

Mean Scores on Question 1 for the Four Experimental Groups

Group	N	Mean	S.D.
Group 1 - NC	32	3.97	1.28
Group 2 - NN	32	4.09	1.03
Group 3 - PC	32	4.47	1.16
Group 4 - PN	32	4.37	1.26

It is clear from Table 12 that the negative noncontingent group (Group 2) did not feel more helpless than other groups, as measured by mean score on Question 1 of the questionnaire.

To look at these data another way, the frequencies with which each group checked off the low points (1-3) and the high points (6-7) on the successfulness scale were compared, and are presented in Table 13. A total of 28 subjects (16 contingent, 12 noncontingent) felt unsuccessful; 18 subjects (7 contingent, 11 noncontingent) felt quite successful. (The remaining 82 subjects were in the middle ranges of feeling successful.)

Using a chi square technique, it was again found that the negative noncontingent group (Group 2) did not differ from the other groups, nor did the two contingent groups differ from the two noncontingent ones. However, a comparison of the combined negative groups (Groups 1 and 2) with the combined positive groups (Groups 3 and 4) yielded a chi square of 3.286, which, for 1 degree of freedom, approaches significance (with 1 df, a chi square of 3.84 is significant at the .05 level). Thus, there is a suggestion that positive subjects, irrespective of contingency or noncontingency, may

Table 13

Number of Subjects Experiencing Low and High Levels of Success on Target-Shoot

	Group 1 NC	Group 2 NN	Group 3 PC	Group 4 PN
LOW (not successful)	10	7	6	5
HIGH (successful)	2	4	5	7

have tended to feel somewhat more successful than negative subjects.

To test hypothesis B2 regarding subjects' awareness of noncontingency, two measures were used: (1) Question 2 of the questionnaire; and (2) attribution to "experimenter control" on Question 3.

Question 2 of the questionnaire asked subjects to recollect the extent to which they believed, as they were doing the task, that hitting the target could or couldn't be done. Scores ranged from a low of 1 ("definitely not") to a high of 7 ("definitely yes"). Mean scores on Question 2 for the four experimental groups are presented in Table 14.

Table 14

Mean Scores on Question 2 for the Four Experimental Groups

Group	N	Mean	S.D.
Group 1 - NC	32	4.28	1.51
Group 2 - NN	32	4.43	1.58
Group 3 - PC	32	4.06	1.58
Group 4 - PN	32	4.12	1.68

A one-way analysis of variance of these data indicated no significant differences between the groups. Consideration of the frequencies with which subjects in the experimental conditions checked off low and high points on the scale likewise yielded nothing approaching significance, either by group, by contingency/noncontingency, or positive/negative.

Attribution to experimenter control was an additional (post hoc) attempt to get at subjects' awareness of noncontingency. The mean percentage attributed to experimenter control by subjects asked to account for their target-shoot performance is shown in Table 15.

Table 15

Mean Percentage Attributed to Experimenter Control by Group

Group	N	Mean	S.D.
Group 1 - NC	32	14.56	18.43
Group 2 - NN	32	19.78	24.22
Group 3 - PC	32	21.31	27.71
Group 4 - PN	32	17.22	19.63

As shown in Table 15, the negative noncontingent group did not attribute more responsibility for their target-shoot performance to experimenter control than did the other groups.

The frequencies with which subjects in the four experimental groups checked off various percentages attributable to experimenter control were also analyzed. The subject population was divided into those who attributed 0% to experimenter control ("low" in experimenter control) and those who attributed 50% or more to experimenter control ("high" in experimenter control). This breakdown is shown in Table 16.

Chi square analysis showed no significant differences in these frequencies, either by group, by contingency/noncontingency, or by positive/negative.

Table 16

Number of Subjects Making Low and High Attributions to Experimenter Control

	Group 1 NC	Group 2 NN	Group 3 PC	Group 4 PN
LOW (0%)	9	6	5	5
HIGH (50%+)	1	4	6	2

These two sets of results together (Question 2 and attribution to experimenter control) lead to the conclusion that awareness of noncontingency did not differ according to experimental condition. Hypothesis B2 was not supported. These data are also evidence that our manipulation was successful -- i.e., that subjects received no feedback other than the tone regarding their success in the target-shoot, and thus could not detect the noncontingency. Only 6 noncontingent subjects (fewer than in the contingent group!) attributed their outcomes to experimenter control.

Attributions and Affective Responses

It was expected (hypotheses C1 and C2) that contingent subjects and positive noncontingent subjects would make proportionately more internal attributions (i.e. ability, effort) for their outcomes than external attributions (task difficulty, luck, experimenter control), compared to negative noncontingent subjects. Negative noncontingent subjects were predicted to attribute a proportionately greater percentage of responsibility for their target-shoot performance to external factors than to ability or effort, compared to contingent and positive noncontingent subjects (hypothesis C3). Table 17 presents the mean percent attribution by each experimental group to each of the five attributional categories. Figure 10 presents these data graphically.

Table 17

Mean Percent Attributed to Each of the Five Attributional Factors by Each Experimental Group

	Group 1 NC		Group 2 NN		Group 3 PC		Group 4 PN	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
ABILITY	26.91	18.52	30.87	16.71	29.37	17.63	23.69	12.35
DIFFICULTY OF THE TASK	16.44	14.18	15.47	12.01	15.00	14.26	18.91	15.54
EFFORT	23.00	17.27	21.44	12.71	22.19	15.55	24.81	20.18
LUCK	19.09	20.35	12.41	9.34	12.09	12.51	15.31	11.68
EXPERIMENTER CONTROL	14.56	18.43	19.78	24.22	21.31	27.71	17.22	19.63

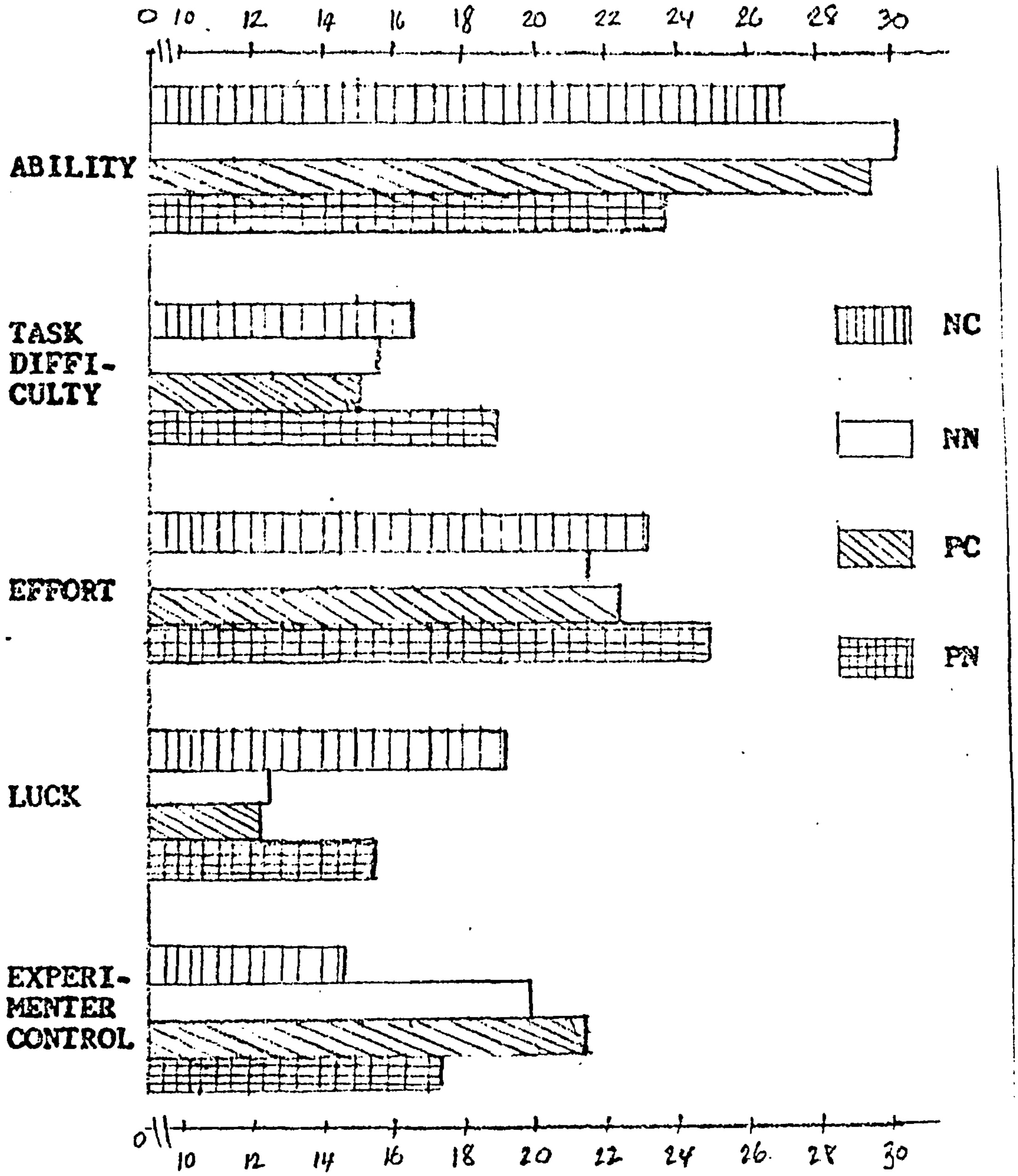

Figure 10 - Percent Attributed to Each of the Five Attributional Factors by Each Experimental Group

The attributions made to each category by the four experimental groups were analyzed by 5 one-way analyses of variance. No significant differences among groups were revealed.

While it is true that contingent and positive noncontingent subjects generally made more internal attributions than external (as predicted by hypotheses C1 and C2), the negative noncontingent subjects did so as well, which was not predicted (see hypothesis C3).

Discriminant analysis of the data yielded no significant attributional patterns which differentiated the experimental groups. That is to say, subjects did not differentially attribute their target-shoot performance according to whether they were contingent or noncontingent, punished or rewarded.

With respect to affective responses, it was predicted that negative noncontingent subjects would be more anxious, depressed, and hostile by the end of the experiment than would other subjects (hypothesis C4). These subjective mood states were assessed by means of the Multiple Affect Adjective Check List (MAACL) administered twice during the experiment. Half the experimental subjects filled out the MAACL before the target-shoot, the other half after the target-shoot. All subjects did the MAACL for the second time at the end of the experiment.

Analysis of variance techniques had shown that there were no differences on these final affect scores according to whether the first MAACL administration had been before or after the target-shoot. All final affect scores are therefore considered together.

Scores on the final MAACL administration are presented in Tables 18, 19, and 20, separately for anxiety, depression and hostility. Piloting had indicated that MAACL scores might usefully be analyzed separately for males and females. Accordingly, Tables 18, 19, and 20 are broken down by sex as well as by experimental condition.

Table 18

Mean Anxiety Scores on the MAACL at the End of the Experiment

(higher scores indicate more anxiety)

Group		N		Mean		S.D.	
(1) Negative Contingent							
Total		32		8.87		3.20	
	Male		16		8.25		3.40
	Female		16		9.50		2.97
(2) Negative Noncontingent							
Total		32		6.84		3.41	
	Male		16		6.62		3.65
	Female		16		7.06		3.26
(3) Positive Contingent							
Total		32		6.72		3.31	
	Male		16		6.87		2.94
	Female		16		6.56		3.74
(4) Positive Noncontingent							
Total		32		7.28		3.78	
	Male		16		7.56		4.15
	Female		16		7.00		3.48
(5) Control							
Total		32		8.09		3.56	
	Male		16		9.00		3.54
	Female		16		7.19		3.45

As can be seen on Table 18, the mean score on anxiety for the total negative noncontingent (Group 2) subjects was not higher than for other subjects. With respect to anxiety, hypothesis C4 was not confirmed.

Other group differences on Table 18 were tested as well. The NN (Group 2) mean of 6.84 was significantly lower than the NC (Group 1) mean score of 8.87 (p=.017). And for males, there was also a difference between negative noncontingent and control groups (NN male mean = 6.62, control male mean = 9.00, p=.063). These differences were in the direction opposite from what had been predicted.

A priori contrast tests showed that for females there was a marginally significant difference in anxiety between the positive and the negative groups taken together: an anxiety mean of 8.28 for the two negative vs. 6.78 for the two positive groups (p=.08). In addition, the NC (Group 1) female mean of 9.50 was significantly higher than the NN (Group 2) mean of 7.06 (p=.045). The Duncan test showed the mean difference between the two contingent groups (9.50 for Group 1 and 6.56 for Group 3) was significant at the .05 level.

With respect to the depression scores as measured by the MAACL at the end of the experiment, a look at Table 19 reveals that, contrary to the hypothesis, the negative noncontingent group was not left feeling more depressed than other groups. An analysis of variance indicated that there were no significant differences on total mean depression scores for the five groups.

Table 19

Mean Depression Scores on the MAACL at the End of the Experiment

(higher scores indicate more depression)

Group	N	Mean	S.D.
(1) Negative Contingent			
Total	32	15.59	5.43
Male	16	15.37	6.49
Female	16	15.81	4.32
(2) Negative Noncontingent			
Total	32	13.75	4.81
Male	16	12.69	5.96
Female	16	14.81	3.15
(3) Positive Contingent			
Total	32	13.69	6.09
Male	16	15.62	5.55
Female	16	11.75	6.15
(4) Positive Noncontingent			
Total	32	14.59	5.84
Male	16	15.06	6.69
Female	16	14.12	5.03
(5) Control			
Total	32	14.93	4.57
Male	16	15.56	4.03
Female	16	14.31	5.11

A priori contrast tests showed that, for males, again contrary to expectation (hypothesis C4), the depression score for Group 2 (12.69) verges on being significantly lower than the average for the other experimental groups (p=.117).

A priori contrast tests for females showed that, as with anxiety, the two negative groups had higher depression scores than the two positive groups (15.31 vs. 12.94, p=.054). Again, as with anxiety, the Duncan test showed that for females the mean difference between Group 1 (15.81) and Group 3 (11.75) was significant at the .05 level; i.e., among contingent females, the positive group was less depressed than the negative.

Table 20 does not reveal higher hostility scores for the negative noncontingent subjects than for others. Analysis of variance did not indicate any significant differences among experimental groups.

Table 20

Mean Hostility Scores on the MAACL at the End of the Experiment

(higher scores indicate more hostility)

Group	N		Mean		S.D.	
(1) Negative Contingent						
Total	32		8.97		3.20	
Male		16		9.31		3.72
Female		16		8.62		2.66
(2) Negative Noncontingent						
Total	32		7.75		3.33	
Male		16		7.12		3.44
Female		16		8.37		3.20
(3) Positive Contingent						
Total	32		8.00		3.95	
Male		16		8.19		4.53
Female		16		7.81		3.41
(4) Positive Noncontingent						
Total	32		8.12		3.63	
Male		16		8.19		4.48
Female		16		8.06		2.69
(5) Control						
Total	32		7.78		3.51	
Male		16		8.94		3.97
Female		16		6.62		2.60

The hostility scores, considered separately by sex, do not reveal any significant differences either, although the patterns of scores are similar to those seen for anxiety and depression. The difference between negative noncontingent females and control females approaches significance ($p=.095$) with noncontingent females more hostile than controls.

Clearly, hypothesis C4 has not been confirmed; the negative noncontingent subjects are not left more anxious, depressed, or hostile than other subjects, as determined by scores on the MAACL taken at the end of the experimental procedure.

Hypothesis C5 predicted unspecified differences between negative noncontingent and positive noncontingent subjects with respect to attributions and/or affective responses. As we have seen, no such differences showed up on the MAACL. Only the two negative groups together differed from the two positive groups, for the female sample, on both anxiety ($p=.08$) and depression ($p=.054$). The differences between the two noncontingent groups were not significant.

Unspecified differences in attributions betweeen the two noncontingent groups were part of the speculations of hypothesis C5 as well. This was mildly true in that negative noncontingent subjects were somewhat more like the contingent in their attributional patterns than were the positive noncontingent (see Table 17). In general, hypothesis C5 was not confirmed.

Summary of Results

A. Test Task Performance (Learned Helplessness)

Worse performance on all three dependent measures for total noncontingent than for control group (Hypothesis A1).

Worse performance on two of the three dependent measures for negative noncontingent vs. control groups (A2) and positive noncontingent vs. control groups (A3). Learned helplessness has thus been clearly demonstrated.

No performance difference between positive noncontingent and negative noncontingent groups (A4).

No performance differences between total contingent and control groups (A5), between negative contingent and control groups (A6), or between positive contingent and control groups (A7). In other words, no evidence of learned industriousness was found.

Worse performance for total noncontingent than total contingent groups on all three dependent measures (A8). For negative noncontingent vs. contingent (A9) and positive noncontingent vs. contingent (A10), performance was significantly worse on the Trials to Criterion measure, and marginally worse on the two other dependent measures.

Contrary to the hypothesis, among noncontingent subjects worse performance was not found for those who made ability attributions than for those who did not (A11).

With respect to the prediction of worse performance for noncontingent subjects acknowledging generalized test nervousness, this result was found for males only, significantly on one dependent measure, marginally on the other two (A12).

Importance of the task had no significant influence on task performance for noncontingent subjects (A13).

B. Feelings of Helplessness

Neither greater feelings of helplessness nor greater awareness of noncontingency were found among negative noncontingent subjects than among other subjects (Hypotheses B1, B2).

C. Attributions and Affective Responses

Contingent subjects (Hypothesis C1) and positive noncontingent subjects (C2) were predicted to make proportionately greater attributions to ability and effort than to luck, task difficulty and experimenter control. The converse was predicted for negative noncontingent people (C3). These predictions were not borne out, however, as all subjects made more internal than external attributions. No attributional patterns differentiated the experimental groups.

There was no greater amount of anxiety, depression or hostility found among negative noncontingent subjects than among the other subjects (C4).

There were no clear differences found between the two noncontingent groups with respect to attributions or emotional responses (C5).

DISCUSSION

The behavioral results of this experiment are consistent with outcomes predicted by the learned helplessness formulation (e.g. Seligman, 1975). The noncontingency of the situation, the lack of relationship between response and feedback, was responsible for the subsequent performance deficit. Aversiveness was not necessary; the debilitation was as great in the positive condition, where subjects received noncontingent reward, as in the negative condition, where subjects received noncontingent punishment.

This result contradicts Miller and Norman (1979) who, in their summary of learned helplessness research, conclude that "noncontingent reinforcement is not a ... sufficient condition for the development of learned helplessness" (p. 98). They imply that aversiveness is necessary as well, an unwarranted conclusion in light of these results.

Miller and Norman present two studies as evidence that "noncontingent positive reinforcement" does not produce the effect. The experiments cited are Benson and Kennelly (1976) and Miller and Gold (unpublished). Both these studies used the standard Levine (1971) concept-formation training task. As discussed earlier, this is problematical, partly because of the definition of "positive", partly because conflicting sources of feedback available to subjects may have caused disbelief or confusion, or worse. It may be that Levine-type concept task cards are intrinsically aversive, engendering frustration under any circumstances. Just having to look at them was debilitating for Hiroto and Seligman's (1975) control group in the cognitive/ cognitive portion of their experiment. And Griffith's (1977) original control group, forced to flip repetitively through the concept-task cards, suffered greater anagram test decrement than either noncontingent group!

In any event, the results of the present research refute Miller and Norman's insistence that aversiveness must be present in the etiology of learned helplessness.

The findings also refute the notion, suggested by Buchwald, Coyne, and Cole (1978), that debilitation in the usual learned helplessness paradigm can be explained as resulting from experiencing failure in the pretreatment phase, without invoking noncontingency as an explanation. In the present experiment, failure was not differential for contingent vs. noncontingent subjects. Noncontingent subjects felt no less successful than contingent ones (according to self-report). It is true that positive subjects (both contingent and noncontingent) tended to feel somewhat more successful than negative (punishment) subjects, as measured by question 1 on the questionnaire. However, there was no significant difference in anagram performance, no behavioral decrement, for negative vs. positive subjects, as the Buchwald et al. position would require.

The results also demonstrate clearly that learned helplessness can occur across modalities. This may be the first experiment in which cognitive test task debilitation (on the anagrams) has followed instrumental helplessness pretreatment under conditions of positive (non-aversive) feedback. Miller and Norman (1979), summarizing some of the literature, conclude that in order for cross-situational generalization to take place two conditions are necessary: (1) pretreatment noncontingency must be prolonged, and (2) instruction must be designed to induce an attribution of task performance to ability. Both of those conditions seem to have been met by the procedures used in this experiment.

One of the most dramatic results of this research has to do with the subjective experience of helplessness. It had been predicted that the negative noncontingent group would acknowledge greater feelings of helplessness as well as greater awareness of noncontingency than all other subjects.

The present research turned up not the slightest tendency in this direction. Sheldon Cohen (1978) had voiced the fear that without an awareness of noncontingency subjects would be "functionally contingent" and would not manifest the behavioral decrement. Clearly, he was mistaken with respect to the subjects in this experiment.

Researchers investigating aspects of non-aversive noncontingency have consistently found that their noncontingent subjects reported more uncontrollability (Roth and Bootzin, 1974; Benson and Kennelly, 1976; Cohen et al., 1976; Hiroto and Seligman, 1976) or more helplessness (Roth and Kubal, 1975; Griffith, 1977) than other subjects. The procedures used in the present research were designed to be deliberately ambiguous, and to make noncontingency difficult or impossible to perceive. In this research, feedback came from only one source -- the apparatus (tone or no-tone). Without conflicting feedback from any other source, subjects were not aware of noncontingency between behavior and (positive or negative) feedback.

Based on attributional notions (e.g. Kelley, 1967) and on the author's cognitivist proclivities, it was hypothesized that the negative noncontingent subjects, making external attributions for negative outcomes, would be more receptive to the noncontingency, and thus somehow more likely to be aware of it than the positive noncontingent group. The manipulation worked so well, however, that no awareness of noncontingency or greater feelings of helplessness was found for any group. Only 6 subjects out of 64 noncontingent (fewer than contingent) suspected the experimenter was controlling things; probably this figure represents an average "suspiciousness quotient".

The predictions linking mental phenomena with behavioral helplessness were not confirmed. Attributions for outcomes were largely to ability and effort, undifferentiated by experimental condition, consistent with what would be expected among a college population trying to perform well on a straightforward laboratory task. With respect to affect, the negative noncontingent group did not end up with greater amounts of anxiety, depression, or hostility than did other subjects, as had been predicted.

Other experiments involving response/outcome independence have produced greater amounts of negative affect for noncontingent subjects (e.g. Roth and Kubal, 1975; Gatchel et al., 1975; Wortman et al., 1976; Griffith, 1977), as well as differential attributions (e.g. Benson and Kennelly, 1976). In all these experiments, however, response/ outcome independence was apparent to subjects. It seems likely that this awareness is necessary in order for the cognitive and/or emotional concomitants of helplessness to be manifest. Thus, because there was no awareness of noncontingency and no helplessness experienced by noncontingent subjects, the lack of results linking cognitive variables with helplessness makes sense. Here perhaps Cohen (1978) is right, but only with respect to mental phenomena: in the absence of awareness of noncontingency, no cognitive and/or emotional effects of the helplessness pretreatment were present.

Traditional learned helplessness theoreticians have generally explained the phenomenon in terms of attributions, motivations, and other cognitive processes (e.g. Seligman, 1975; Maier and Seligman, 1976; Abramson et al., 1978). This viewpoint posits behavioral effects as resulting from cognitions; without awareness of noncontingency, it follows directly from this position that there should be no helplessness effect.

All hypotheses regarding cognitive variables were based on this cognitivist assumption that helplessness derives from these subjective mental events. Hypotheses B1 to C5 were designed to see what kinds of mental phenomena (helplessness feelings, attributions, emotions) are correlated with helpless behavior, and whether the cognitions are different for positive vs. negative outcome subjects.

If the traditional cognitivist view of the learned helplessness phenomenon were correct, the success of this research in eliminating awareness of noncontingency would have wiped out the possibility of producing a helplessness effect (in addition to eliminating the cognition/ helplessness relationship). But there is a strong helplessness effect here, a behavioral deficit without associated cognitions. These results are inconsistent with the traditional view of the learned helplessness phenomenon. How can this be?

One possibility is that the measures used to assess attributions and affect were not sensitive enough to detect the true relationship between helplessness and mental phenomena. However, the measures used here have been used before in learned helplessness research. Many investigators have used questions similar to questions 1 and 2 of the questionnaire to assess the subjective experience of helplessness (e.g. Hiroto and Seligman, 1975; Griffith, 1977). The attribution measure is standard in much research (e.g. Benson and Kennelly, 1976), as is the MAACL, measuring affect (e.g. Gatchel et al., 1975). Many of these investigations used smaller samples than that used in the present research, and all of them turned up some meaningful results differentiating the experimental groups.

Another fact to consider is that the cognitive measures here *were* sensitive enough to show some differences that are logical (e.g. negative females more anxious than positive females) although unrelated to helplessness. So it does not seem likely that the finding of no relationship between behavioral helplessness and the cognitive variables can be attributed to insensitivity of the cognitive measures.

There is another way to look at these data. The behaviorist point of view posits no necessary relationship between cognitive variables and changes in behavior such as those produced by reinforcement (e.g. Dixon & Oakes, 1965; Thaver & Oakes, 1967; Oakes, 1967). Skinner's (1974) position is that all behavior is strictly a function of environmental variables (such as past reinforcement history, stimulus generalization, etc.). Introspective observations are epiphenomena, "collateral products of (environmental) histories" (p. 17), which may or may not go along with the observed behavior, depending on the conditions of the experiment. They are not the cause of the behavior. Behavior is a product of learned environmental contingencies, and nothing more.

If the subject in the learned helplessness paradigm has other sources of feedback in the noncontingent task, he or she may make appropriate attributions and experience cognitive events appropriate to the experience of noncontingency.

Such may well have been the case in those experiments in which subjects trying to solve discrimination problems were being given noncontingent feedback at odds with their experience of the task (e.g. Benson and Kennelly, 1976; Griffith, 1977). These subjects very likely adduced "implicit causal theories" (Nisbett and Wilson, 1977) to explain what was happening to them. The human brain is only too ready to adduce "good" reasons for its behavior, after the fact. Cognitions, rationales, occur so quickly that they seem reasonable precursers of action. The evidence compellingly presented by Nisbett and Wilson, however, suggests that cognitions may truly be by-products, or concomitants, of action, rather than causes. The results presented here support this likelihood.

If there is no other source of feedback so that subjects can't be aware of noncontingency, as in the present research, then they won't make those attributions and they won't have those cognitive experiences. But they may still exhibit learned helplessness, behavioral deficit, as noncontingent subjects did here, and as Griffith's noncontingent success subjects did as well. Griffith's subjects were trying to solve concept formation problems in the noncontingent task, generating hypotheses about what the correct stimulus dimensions were. Being given random feedback must have caused them to formulate more and more complicated hypotheses; the invariable "correct" at the end of each problem very likely confirmed that their more complicated hypotheses were correct. Suspiciousness would not then have been aroused in these subjects, and it is quite likely that they did not take in any extraneous feedback or become aware of noncontingency. The learned helplessness effect was then seen, but <u>without</u> any subjective feelings of helplessness. Without cognitive processing, what could be the mechanism by which this comes about?

Mackintosh (1973) discusses behavioral helplessness as arising from learning to ignore stimuli that signal no change in reinforcement. This "learned irrelevance" can get in the way of subsequently learning to form an association between a stimulus and a reinforcement. Oakes (1980) has derived this learned irrelevance phenomenon from S-S conditioning principles: when a subject experiences zero correlation between two classes of stimuli -- such as, for example, response- produced stimulation from his or her own behavior and the occurrence or non-occurrence of reinforcement -- later learning is hindered when the situation changes so that there is now a non-zero correlation between those classes of stimuli. This effect results from "automatic" conditioning mediated by neurological processes. Thus, in the present research, the experience of noncontingency produced zero correlation between response and (positive or negative) outcomes. Conditioning to this zero correlation retarded later learning, when in the second task the correlation between response and feedback was non-zero.

The fact that this helplessness effect can be demonstrated with rats, dogs, or pigeons (e.g. Seligman, 1975) is evidence that producing it does not require "awareness" or other cognitions. Why should there not be a similar effect with human subjects? We would expect college students to learn as well as rats or pigeons that two stimuli are uncorrelated -- even when we keep them from "cognizing" about the noncontingency by hiding it from them. The zero correlation is still there.

So we seem to have evidence that learned helplessness in humans can be demonstrated without the cognitive phenomena that most theorists have assumed is the causal basis of it. The suggestion is that other researchers (e.g. Hiroto and Seligman, 1976; Griffith's (1977) noncontingent failure group) have obtained the "helplessness" result because their subjects had an extraneous source of feedback on the noncontingent task, which may have produced effects such as antagonism or frustration. "Why should I try?" seems like a perfectly rational response to the realization that the dice are loaded, and that one has no control over events. This can have a variety of possible effects on later performance. Those effects, however, do not fit the definition of learned helplessness (which is performance decrement based on prior experience of independence of behavior and outcomes). Perhaps what is shown in those experiments is a sensible "intentional passivity" or "strategic withdrawal". We would argue, therefore, that such irrelevant effects must be eliminated or controlled for in order for true learned helplessness to be demonstrated. This has been accomplished in the present research. This experiment, and possibly that of Gampel (1976), may be the only actual demonstrations of a genuine learned helplessness effect with human subjects.

APPENDIX

QUESTIONNAIRE

1. During the target-shoot, to what extent did you believe you could be successful?

1	2	3	4	5	6	7
Definitely Not			Moderately or Sometimes			Definitely Yes

2. During the target-shoot, to what extent did you believe hitting the bullseye could or couldn't be done?

1	2	3	4	5	6	7
Definitely Not			Moderately or Sometimes			Definitely Yes

3. During the experiment, you were trying to hit the bullseye as often as possible. To what extent do you feel that each of the factors listed below was responsible for determining your degree of success or failure? Please give your estimates in percentages of the total responsibility attributable to each factor.

Your own ability	_____%
Difficulty level of the task	_____%
Your own effort	_____%
Chance or luck	_____%
Experimenter control	_____%
Total=	100%

4. Compared to most people you know, how nervous are you generally on tests of any kind?

1	2	3	4	5	6	7
Not at All			Moderately or Sometimes			Very Nervous

5. How important is it to you to do well in laboratory tasks of the type we've been doing here today?

1	2	3	4	5	6	7
Not at All			Moderately or Sometimes			Very Important

1 ☐ active
2 ☐ adventurous
3 ☐ affectionate
4 ☐ afraid
5 ☐ agitated
6 ☐ agreeable
7 ☐ aggressive
8 ☐ alive
9 ☐ alone
10 ☐ amiable
11 ☐ amused
12 ☐ angry
13 ☐ annoyed
14 ☐ awful
15 ☐ bashful
16 ☐ bitter
17 ☐ blue
18 ☐ bored
19 ☐ calm
20 ☐ cautious
21 ☐ cheerful
22 ☐ clean
23 ☐ complaining
24 ☐ contented
25 ☐ contrary
26 ☐ cool
27 ☐ cooperative
28 ☐ critical
29 ☐ cross
30 ☐ cruel
31 ☐ daring
32 ☐ desperate
33 ☐ destroyed
34 ☐ devoted
35 ☐ disagreeable
36 ☐ discontented
37 ☐ discouraged
38 ☐ disgusted
39 ☐ displeased
40 ☐ energetic
41 ☐ enraged
42 ☐ enthusiastic
43 ☐ fearful
44 ☐ fine
45 ☐ fit
46 ☐ forlorn
47 ☐ frank
48 ☐ free
49 ☐ friendly
50 ☐ frightened
51 ☐ furious
52 ☐ gay
53 ☐ gentle
54 ☐ glad
55 ☐ gloomy
56 ☐ good
57 ☐ good-natured
58 ☐ grim
59 ☐ happy
60 ☐ healthy
61 ☐ hopeless
62 ☐ hostile
63 ☐ impatient
64 ☐ incensed
65 ☐ indignant
66 ☐ inspired
67 ☐ interested
68 ☐ irritated
69 ☐ jealous
70 ☐ joyful
71 ☐ kindly
72 ☐ lonely
73 ☐ lost
74 ☐ loving
75 ☐ low
76 ☐ lucky
77 ☐ mad
78 ☐ mean
79 ☐ meek
80 ☐ merry
81 ☐ mild
82 ☐ miserable
83 ☐ nervous
84 ☐ obliging
85 ☐ offended
86 ☐ outraged
87 ☐ panicky
88 ☐ patient
89 ☐ peaceful
90 ☐ pleased
91 ☐ pleasant
92 ☐ polite
93 ☐ powerful
94 ☐ quiet
95 ☐ reckless
96 ☐ rejected
97 ☐ rough
98 ☐ sad
99 ☐ safe
100 ☐ satisfied
101 ☐ secure
102 ☐ shaky
103 ☐ shy
104 ☐ soothed
105 ☐ steady
106 ☐ stubborn
107 ☐ stormy.
108 ☐ strong
109 ☐ suffering
110 ☐ sullen
111 ☐ sunk
112 ☐ sympathetic
113 ☐ tame
114 ☐ tender
115 ☐ tense
116 ☐ terrible
117 ☐ terrified
118 ☐ thoughtful
119 ☐ timid
120 ☐ tormented
121 ☐ understanding
122 ☐ unhappy
123 ☐ unsociable
124 ☐ upset
125 ☐ vexed
126 ☐ warm
127 ☐ whole
128 ☐ wild
129 ☐ willful
130 ☐ wilted
131 ☐ worrying
132 ☐ young

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