AN ABSTRACT OF THE THESIS OF

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in Psychology presented on December 8, 1982

Title: THE USE OF VERBAL AND CONCRETE POSITIVE

REINFORCEMENT TO INDUCE LEARNED HELPLESSNESS IN ADULTS

Abstract approved: Stephen F. Davis

Since the initial study in 1967, a large amount of research has accumulated demonstrating that after exposure to inescapable aversive stimuli (e.g.,shock, loud noise, etc.) subjects will show performance decrements on subsequent tasks. This "learned helplessness" effect has been induced in a wide variety of species, from goldfish to humans. Only recently, however, has any research been conducted using noncontingent positive reinforcement in a learned helplessness paradigm. While these studies have shown a helplessness effect, to date all of the subjects utilized have been children. Therefore the results cannot be generalized to an adult human population. The present study was undertaken in an effort to demonstrate that noncontingent positive reinforcement can induce a learned

helplessness effect in adults, i.e.,college students. The additional variable of type of reinforcement was included to examine any possible differences between verbal and concrete reward. This was done in an attempt to equate, at least on an elementary level, the learned helplessness research with the educational research on failure.

The subjects were 96 introductory psychology students who were randomly assigned to one of four groups; 100% noncontingent reinforcement, 50% random reinforcement, contingent reinforcement, and the control group, which was not exposed to the treatment phase. These four basic groups were broken down further into either verbal or concrete reinforcement. The treatment phase consisted of matching block designs with the Wechsler Intellegence Scale for Children four color blocks. The performance phase involved a letter/number substitution task.

Analysis of the data showed no significant differences between verbal and concrete reinforcement. Further statistical analysis produced a significant ($\underline{p} < .05$) difference between the four different treatment groups. The Newman-Kuels technique was employed to determine specific group differences, and showed that the 50% and 100% reinforcement groups were statistically equivalent, as were the contingent and control groups. The 50% and 100% groups did, however, display a significantly greater number of errors in the performance task than did the contingent and control groups.

The primary conclusion to be drawn from the above data is that learned helplessness can indeed be induced in adults by exposing them to noncontingent positive reward. It is also of interest that both concrete and verbal reinforcement are equally effective in producing this helplessness effect. Finally, the fact that the 50% and the 100% groups produced equal decrements in performance is curious in light of previous research which usually shows the 100% group as the most debilitating to subsequent learning tasks.

THE USE OF VERBAL AND CONCRETE POSITIVE REINFORCEMENT TO INDUCE LEARNED HELPLESSNESS IN ADULTS

A Thesis

Presented to

the Department of Psychology

EMPORIA STATE UNIVERSITY

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

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by

David G. Lamb

November, 1982

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ACKNOWLEDGEMENTS

I would like to express my sincerest gratitude to Dr. Stephen Davis for the direction, support, and motivation he provided so generously. While his availibility as an extensive storehouse of knowledge and experience made the completion of this thesis possible, it was his energy and humor which made the process enjoyable.

I would also like to thank Dr. David Dungan and Dr. Ray Heath for serving on my thesis committee. In addition, I would like to thank Dr. James Tramill for his assistance in the planning and implementing of the actual data collection.

Finally, I would like to thank my family for all the love and confidence they provided. More specifically, I would like to convey my deepest appreciation for the moral and financial support of my parents and the inspiration and desire to achieve provided by my two older brothers.

TABLE OF CONTENTS

LIST OF FIGURES

Figure | Page

LIST OF TABLES

CHAPTER 1

INTRODUCTION

When humans perceive that they lack the ability to control potential outcomes in a specific situation, a condition known as "learned helplessness" results. The phenomenon of learned helplessness developed from the study of avoidance behaviors in response to aversive stimuli. A typical study of avoidance learning (e.g., Solomon & Wynne, 1953) involves placing a dog in a shuttle box, which consists of two compartments separated by a barrier of moderate height. A conditioned stimulus, e.g., a light, is presented 10 seconds prior to electrifying a wire grid floor. The shock may be terminated by jumping the barrier to the opposite compartment. Eventually, the dog will jump the barrier immediately following the onset of the light and thus <u>avoid</u> the shock. Dogs, and many other organisms (e.g., chinchillas, Carman, 1974; ferrets, Rusiniak, Gustavson, Hankins, & Garcia, 1976; land snails, Siegel & Jarvik, 1974; cockroaches, Willard, 1975; octopuses, Barlow & Sanders, 1974; rainbow trout, Riege & Cherkin, 1976; and desert iguanas, Richardson & Julian, 1974) are able to learn avoidance behavior quite readily.

Subsequently, it has been found that avoidance behavior could be prevented, or severely impaired, by the presentation of several, severe, inescapable shocks administered 24 hours prior to the shuttle box avoidance task (Seligman & Maier, 1967). The response of dogs so treated was to endure the full 60-second duration of the shock during each trial of the shuttle box task. In other words, the dogs had learned to be helpless and failed to acquire the avoidance response.

The same paradigm has been successfully demonstrated in cats (Seward & Humphrey, 1967), fish (Bintz, 1971), birds (Killeen, 1978), mice (Braud, Wepman, & Russo, 1969), rats (Maier, Albin, & Testa, 1973), and humans (Hiroto & Seligman, 1975). Research utilizing subjects of the last type are of particular interest as the present study also involved the use of human subjects. In the study reported by Hiroto and Seligman (1975), college students were initially exposed to an unavoidable loud noise. In the second phase of the experiment the subjects were tested in a finger shuttle box which allowed for the avoidance of the noise. The object of the task was to move the finger from one compartment to the other in order to avoid the aversive stimulus presentation. When compared with control subjects not previously exposed to the inescapable loud noise who quickly learned the correct response, the experimental group failed to acquire appropriate avoidance learning.

There are a number of competing theories which offer alternative explanations for the phenomenon described as learned helplessness. Several of these will be presented below with a countering argument from the helplessness viewpoint.

It should be noted that other alternate theories exist in addition to those presented here. Their exclusion is due to the lack of research to either support or refute their positions.

An objection which immediately comes to mind concerns the possibility that the debilitating effects could be due to the actual physiological trauma of the shock rather than the psychological element of uncontrolability. It was just such a consideration which prompted Seligman and Maier (1967) to develop a "triadic" experimental design which employed three different groups. The first group of dogs was allowed to escape shock by pressing a panel with their noses. The second, "yoked" group received exactly the same number, duration, and pattern of shocks as the first group. Pressing the panel did not effect the shock for the "yoked" dogs. The third group did not receive the pretreatment and therefore served as a control group. When tested in a shuttle box escape task 24 hours after the pretreatment, only the first and third groups showed escape/avoidance behavior, while the "yoked" dogs failed to demonstrate such learning. Therefore, since both the first and second groups received exactly the same shocks, the differences found in the subsequent shuttle box task could not be explained by any physical repercussions resulting from the shock itself.

A second alternate hypothesis (Maier & Seligman, 1976) proposes that the subject adapts to the shock during the pretreatment phase and is thusly not sufficiently motivated by the shocks presented in the escape/avoidance shuttle box task. There are a number of studies which refute this adaptation hypothesis. First, adaptation to intense, repeated shock has not been demonstrated (e.g., Church, LoLordo, Overmier, Solomon, & Turner, 1966). Also, when the avoidance shock level was raised to 6.5mA from the pretreatment level of 4.5mA, there was still no observable alleviation of the interference effects (Overmier & Seligman, 1967). Finally, a review of the above-mentioned helplessness experiment (Seligman & Maier, 1967) reveals that a series of escapable shocks presented in the same apparatus as the inescapable shocks did not produce debilitating effects on escape/avoidance learning while the inescapable shocks of the same pattern, intensity, and duration did. The adaptation theory would predict that the dogs of both groups would adapt to the same level and thus produce no differences between the groups in the later escape/avoidance task.

A third alternative explanation is the incompatable-motor-response theory (Bracewell & Black, 1974). This theory suggests that the rat learns to hold still and/or actually perceives the shock as punishment for movement. Obviously, either of these two reactions to the shock would be incompatable with the motor response necessary to learn an escape task. Research conducted by the proponents of this theory is supportive of their hypothesis (Bracewell & Black, 1974). However, this theory is not necessarily incompatable with the learned helplessness theory, as Maier and Seligman (1976) contend.

> ...the fact that explicit punishment of movement produces a decrement in subsequent escape/avoidance acquisition does not imply that other procedures which produced escape/avoidance decrements do so because they punish movement. Thus the retarding effect of movement punishment does not imply that inescapable shock retards acquisition because it punishes movement. (p.21)

In addition, Maier and Seligman (1976) identify a number of studies which reported data that are inconsistent with the findings of Bracewell and Black (1974). That study (Bracewell & Black, 1974) showed that restraint alone could produce a subsequent escape deficit and that inescapable shock without restraint produced only a small escape deficit. In contrast, Maier et al. (1973) did not find an escape/avoidance decrement with restraint in the absence of shock when using rats as subjects. Nor could Cohen (1970) find an effect on shuttle box escape/avoidance acquisition when restraint alone was used on dogs. Finally, Seligman, Rosellini, and Kozak (1975) demonstrated that unrestrained rats exposed to inescapable shocks subsequently showed large escape deficits.

Another alternate hypothesis (Weiss, Glazer, & Pohorecky, 1975) concerns the physiological response to inescapable shock. The theory suggests that the severe, inescapable shock induces a depletion in the levels of the neurotransmitter, norepinephrine. The depleted levels of norepinephrine, in turn, limit the amount and quality of subsequent motor activity. Such a motor-activation deficit would then interfere with the later shuttle box task. A variety of research led Weiss et al. (1975) to propose this hypothesis. For example, Miller and Weiss (1969) argued that a learned behavior would not dissipate within a period of time as brief as 48 hours and therefore some type of time-dependent physiological alternation must be involved. Also, central catecholamines have been shown to be involved in the mediation of movement (e.g. Herman, 1970). Finally, in a comparison of brain norepinephrine levels following exposure to both escapable and yoked inescapable shock, Weiss, Stone, and Harrell (1970) found that the inescapable shock led to lower levels of norepinephrine in the brain. Maier and Seligman (1976) have offered several rebuttals to this alternative explanation. To begin with, they cite several studies which are inconsistant with the suggestion that learning can not be lost during a 48 hour period (D'Amato, 1973; Spear, 1973). Maier and Seligman (1976) also point out that in experiments conducted by Weiss et al. (1975), a minimum of 20 hours of at least 3.0-mA shock intensity were employed (with the shocks occuring about one per minute) and the norepinephrine levels were assessed immediately after the shock session. In comparison, the learned helplessness studies involved shock levels of 1.0mA during sessions lasting only 1 to 1½ hours and the dependent variable was not measured until 24 hours following the treatment. Such differences in parameters precludes any direct comparison of the two sets of studies. Finally, even if such a comparison was to be made, Seligman and Beagley (1975) demonstrated that rats given inescapable shock failed to learn to escape even seven days following exposure to one session of inescapable shock. Surely one would expect that norepinephrine levels would have returned to normal within seven days.

Glazer and Weiss (1976) went on to propose yet another alternative theory in regard to the interference effect found following long-duration, moderate intensity electric shocks. It has been shown that such treatments can interfere with performance up to a week later. They felt the term "learned inactivity" better described this phenomenon. This descriptive lable was derived from the authors' (Glazer & Weiss, 1976) hypothesis that long-duration, moderate shock allows for the development of a two phase response. Initially the animal will respond to shock with a great deal of activity. As the shock continues, however, the organism becomes less active and by the time the shock terminates has ceased movement altogether. Therefore, the shock termination reinforces inactivity and a simple negative reinforcement schedule is in effect rather than any perception of uncontrollability due to the noncontingent nature of the shock. Using a low activity nose pushing response, a series of experiments were conducted to test this hypothesis. The results showed that rats receiving 60 inescapable, six second shocks on a variable-time, one minute schedule actually showed shorter latencies between the conditioned stimulus and the nose pushing response when compared to the no shock rats. The same result was found when using the nose pushing response with rats yoked to an escape group. In a more recent study specifically designed to test this learned inactivity hypothesis against the learned helplessness explanation, Frank (1977) used a stabilimeter to directly assess inactivity. This measurement was incorporated into a series of four experiments using long duration (six seconds), moderate shock to allow for the two step response proposed by Glazer and Weiss (1976). The author concluded that all four experiments demonstrated performance deficits which supported the learned helplessness theory over that of learned inactivity.

In addition to the above alternate explanations, several theories have been proposed which take into account various cognitive functions in humans not found in animals. Kacher (1978) suggested that the observed performance deficits seen in humans after noncontingent feedback are "a result of the misguiding of the subject away from simple hypothesis testing during the insolvable task." The subject then begins formulating more complex and involved hypothesis, which are inappropriately complicated when the solvable task is presented. The performance deficit results because the subject is trying to apply a complex hypothesis to a simple contingent reinforcement schedule. To test this theory, Kacher (1978) determined the subjects mental state after the insolvable treatment task. If the subject was cognitively inactive, this subject was said to be helpless and should show a performance deficit on the subsequent solvable task. If active, it was further determined whether that cognitive activity took the form of simple or complex hypothesis-testing. This theory would predict that individuals who returned to simple hypothesis-testing would not show a performance deficit, while those using complex hypothesis-testing would demonstrate deficits comparable to the helpless subjects. Neither the simple nor the complex hypothesis-testing groups showed performance deficits, thus supporting the learned helplessness explanation.

Another cognitive alternative theory examines attributional mediators of the learned helplessness phenomenon (Hanusa & Schulz, 1977). The attributional hypothesis predicts that subjects who attributed the task one (the treatment task) failure to a lack of ability should show subsequent performance dificits. The second group, consisting of subjects who attributed task one failure to the difficulty of the task, should not have performance deficits. This theory made no prediction concerning the last group, those attributing the failure to a lack of effort. It was found that the first group, those with the lack of ability attribution, performed better than subjects in either of the other attributional groups. In an attempt to explain this unexpected result, Hanusa and Schulz (1977) cited the work of Wortman and Brehm (1975), who proposed that "subjects exposed to noncontingency attempt to reestablish control and only after repeated unsuccessful attempts do they give up and become helpless." Hanusa and Schulz (1977) hypothesized that subjects who attributed their failures to their lack of ability would be much more likely to feel the need to reestablish their competency than subjects attributing failure to external variables or those with the excuse of not trying. This notion is supported by other research (Wortman, Pancieva, Shusterman, & Hibscher, 1976). These findings, however, are not in direct conflict with learned helplessness theory. In fact, the strength of evidence for attributional mediators in learned helplessness led to the reformulation of the theory (Abramson, Seligman, & Teasdale, 1978). This reformulation agreed that a subject's reaction to an uncontrollable event is determined by the attributions he/she makes about that event. It was further hypothesized that attributions would be predominately made along three different variables; 1) internal/external, 2) stable/unstable, and 3) global/specific. Finally, the reformulated theory predicted that helpless individuals would attribute internal, stable, and global factors to uncontrollable events (i.e. these subjects would attribute the cause of their failures to themselves, which would persist over time, and be prevelent across situations). To control for variance due to such attributions, the present study incorporated a post study questionnaire to determine whether any of these attributions were responsible for any results found.

Since the above theories, and other alternative explanations (Baker, 1976; Black, 1977; Levis, 1976) have yet to produce conclusive empirical evidence which refutes the massive accumulation of research supporting the learned helplessness interpretation, the present study followed the basic assumptions proposed by the learned helplessness theory. A fundamental tenet expounded by the helplessness hypothesis contends that learned helplessness will occur when subjects perceive that their responses have no bearing (i.e. are non-contingent) upon the outcome. In short, when punishment <u>or</u> reinforcement appears to occur regardless of the responses that are made, the subject learns helplessness. To date, with a few exceptions involving appetetive events with animals (Goodkin, 1976; Hulse, 1973; Welker, 1973) and the limited number of studies presented below, the vast majority of research has applied the use of aversive stimuli in this experimental paradigm. In contrast, the present experiment employed noncontingent, positive reinforcement to elicit the learned helplessness effect in humans.

The use of positive reinforcement in the learned-helplessness paradigm has only recently been attempted with human subjects. Nadelman (1978) divided fourth grade children into five groups according to the following reinforcement schedules utilized during the two choice discrimination treatment tasks; 1) contingent reward, 2) random noncontingent reward yoked to group 1, 3) noncontingent 0% reward, 4) noncontingent 100% reward, and 5) the untrained control. As might be expected, in accordance with learning theory , group 1 was significnatly more successful with the contingently rewarded, four choice, concept formation task in comparison to the control group. Also, group 3 (which represents the normal, aversive helplessness situation) did significantly worse on the subsequent task than did the control. Contrary to learned helplessness theory, the second and fourth groups did not differ significantly from each other or the control group. These results are not indicative of all the research with positive, noncontingent reinforcement. For example, Seybert, Wilson, and Vandenberg (Note 1) reported the use of a similar paradigm with children. The treatment variable in this study consisted of 20 block designs to be reproduced by the subjects with four blocks from the Wechsler Adult Intelligence Scale block design subtest. During this task the children were reinforced according to one of three schedules; continuous reinforcement, 50% random reinforcement, or no reward regardless of response. In addition, two control groups were given either contingent reward or were not exposed to the treatment phase. Reinforcement consisted of poker chips which could later be traded for various toys. A pencil-maze-completion task was used to assess the effects of the various pretreatment conditions. The results indicated that the three treatment groups displayed nondifferential, but inferior, performance on the maze task when compared to the control groups. These same general procedures were used in two extended replications. The first of these replications (Seybert, Gilliland, Wilson, McClanahan, & Vandenberg, Note 2) confirmed the findings of the initial study and also found that prior exposure to a controllable event "immunized" the subjects against subsequent noncontingent reinforcement. The second follow-up study examined sex differences in children exposed to noncontingent, positive reinforcement (Seybert, Gilliland, & Attwood, Note 3). Results from this study indicated that boys demonstrated significantly greater debilitation on the maze task than did female subjects. Subsequent research by these authors (Seybert, Note 4) accounted for this sex differnece through the type of toys that were available in exchange for the poker chips. When this variable was controlled (i.e., a wider range of toys with equal appeal to both sexes), the sex differences were eliminated. As can be seen from the above research, learned helplessness can be induced in human children using noncontingent positive reinforcement. The present study was undertaken in an effort to produce this same phenomenon in adult human subjects, i.e., college students.

Furthermore, it certainly appears reasonable to propose the existance of a general relationship between learned helplessness and the educational process, regardless of the age of the student. More specifically, a student who does poorly in school is, in effect, experiencing inescapable emotional shocks due to an inability to respond correctly in school. The resulting helplessness would appear to propagate itself by producing a perceived lack of control over the outcome of one's academic efforts. This conceivably results in a "negative" mental attitude or mental set which, in turn, decreases the likelihood of success, and thus reinforces the development and perpetuation of learned helplessness. Support for this proposed chain of events can be found in the literature (Andrews, 1966; Butkowsky & Willows, 1980). An example with several specific connections to the present study was conducted by Griffith (1977). A control group examined the stimulus cards used in the discrimination treatment task, but did not attempt to solve them. The two noncontingent groups were exposed to the same predetermined schedule at 50% right/wrong feedback, which consisted of the experimenter saying either "correct" or "incorrect". At the end of this task, the noncontingent failure group was given failure feedback on their performance as a whole, while the noncontingent success group was given success feedback on their performance as a whole. The final group was given contingent feedback. On the following anagram task, both noncontingent groups showed performance deficits in comparison to the control and contingent groups. These results indicate that individuals are aware of their performances, and that it is their perception of being unable to control the outcome of their performance which results in further debilitation, regardless of others overall evaluation of their success or failure.

This application of learned-helplessness research and theory may be of particular importance when placed in the context of the special-education environment. Indeed, it is a well documented fact that retarded children are exposed to frequent failures (e.g., Cromwell, 1963; Zigler, 1971). Also, teacher-to-child feedback has been shown to contribute to a helplessness effect seen in retarded children (Dweck, Davidson, Nelson, & Enna, 1978). Other research has produced a helplessness debilitation in retarded children on a variety of learned helplessness measures when they were compared to nonretarded children of equivalent mental age (Weisz, 1979; Weisz, 1981). Of particular relevance to the present study is the fact that many instructors of mentally retarded children attempt to reverse the chronic failure patterns experienced by these children with frequent reinforcement. Such reward is often provided for effort or behavior alone, regardless of the correctness or adequacy of the pupil's responses or answers. This is an analoque of noncontingent positive reinforcement and as such may be responsible for an increased level of inappropriate responding. Testing of just such an hypothesis has, in fact, just been completed (Kleinhammer, Tramill, & Davis, 1982). This study exposed learning-disabled adolescents to concrete, noncontingent positive reinforcement and reported obtaining a significant helplessness effect. Eisenberger, Kaplan, and Singer (1974) also found a helplessness effect by exposing normal children to verbal, noncontingent social approval. The question whether type of reinforcement has an effect on learned helplessness has only recently been asked. Gampel (1976) set out to test whether learned helplessness was reinforcement specific. Using the learned helplessness paradigm, noncontingent positive feedback consisted of either the onset of a light or the experimenter saying "right" and noncontingent negative feedback consisted of the onset of a light or the word "wrong". Subjects who were exposed to the light during the treatment task were given verbal reinforcement during the second task and those given verbal reinforcement first were then exposed to the light. The order was counterbalanced for both positive and negative feedback. From the results found, Gampel (1976) concluded that there was "no effect on learned helplessness from the presence of a different feedback stimulus in the contingent task." Although this study demonstrated that learned helplessness can be induced through the use of both verbal and nonverbal noncontingent feedback, it is questionable whether the onset of a light is a stimulus which is either generalizable or applicable to the human experience. Perhaps a more concrete reinforcement, such as money or material goods, would prove more valuable in more closely reproducing types of reinforcements encounted by most humans in everyday life. In order to bring about a more direct comparison of the roles verbal and concrete reinforcement play in the induction of learned helplessness, these two reinforcement modalities were incorporated as an additional variable in the present study. Also, an effort was made to present these tso types of reinforcement in forms which might be more likely found in the field, i.e. phrases in verbal reinforcement, such as would probably be used in a classroom setting, and poker chips to be exchanged for material goods, to represent a more natural concrete reinforcement.

In summary, the present study, operating within the context of the learned-helplessness theorectical framework, sought to investigate learned helplessness in human adults through the use of noncontingent, positive reinforcement.

Such reinforcement was either verbal or concrete in nature. The learned-helplessness hypothesis would anticipate that subjects receiving either noncontingent concrete, or non-contingent verbal reward would show performance deficits on a subsequent task. Whereas such a debilitating consequence would not be expected by subjects receiving contingent reinforcement (whether it be verbal or concrete) or by control subjects not exposed to the treatment phase at all.

CHAPTER 2

METHOD

Subjects

The subjects were 96 Emporia State University undergraduate students (48 males, 48 females) enrolled in introductory psychology classes. The ages of the subjects ranged from 17 to 24.

Apparatus

In the non-contingent reinforcement situation, Phase 1, the experimental apparatus consisted of 16, 28 cm by 18 cm cards which displayed multicolored block designs. To insure that the subjects perceived a condition of noncontingency, only eight of the 16 block design could be solved using the nine blocks provided. These blocks were taken from the Wechsler Intelligence Scale for Children. Each block was 2.7 cm square with one red, yellow, white, and blue side, and a blue/yellow split side and a red/white split side.

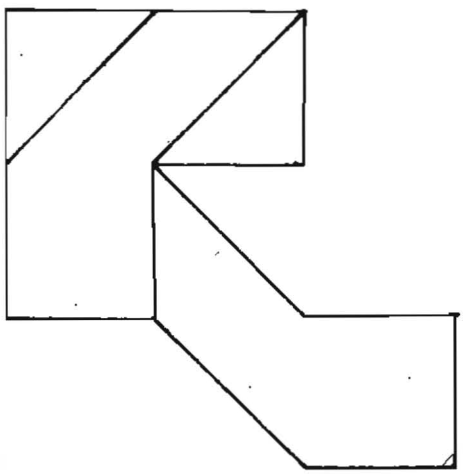
See Figure 1 on following page

The testing phase, or contingent reinforcement situation, involved a digit/letter group coding task. The key consisted

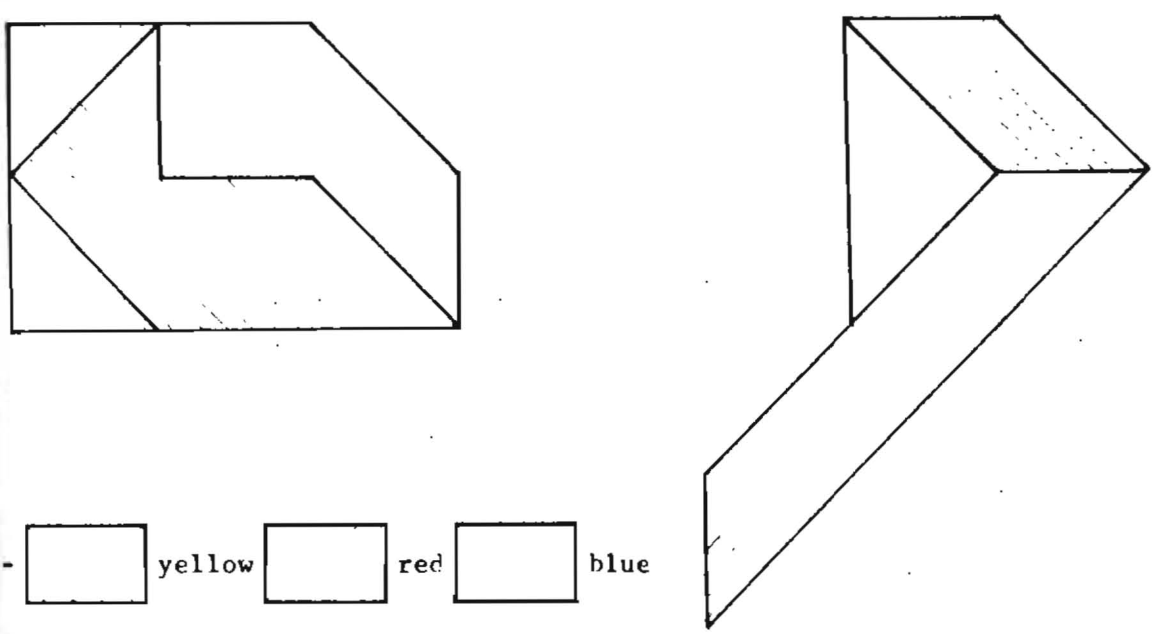
FIGURE 1

Examples of Solvable and Insolvable Block Designs as Presented to Subjects in Phase 1

Solvable Block Designs



Insolvable Block Designs



of 20 letters and the digits one through ten randomly assigned in groups of three, with a letter above and a letter below each number (to see example, refer to Figure 2 below). No sequence was repeated throughout the 12 keys used. The subjects task was to fill in the missing digit/letter for each group of three. The location of the blank space, the group sequence, and the missing digit/letter were all determined at random.

FIGURE 2

Example of the Letter/Digit Coding Task as Presented to Subjects in Phase 2

I. Key

O	M	S	G	T	E	K	L	W	B
4	2	10	9	6	1	7	5	3	8
J	H	N	C	P	R	V	A	F	Z

II. Task

B	C	S	J		1		6		10		E	M	W	
	G	N		K	R	9		M	S	4			F	A
8			4	7		G	P	H		J	1	2		L

Procedure

The experiment consisted of two distinct phases. During Phase 1, a block design task was employed to introduce the treatment variable, which was either contingent or non-contingent reinforcement administered during this cognitive task. Phase 2 consisted of assessing the degree of learned helplessness through performance on a coding task. The subjects were randomly assigned to one of two major conditions, either verbal or concrete reinforcement. Within these conditions, subjects were again randomly selected to receive reinforcement in accordance with one of the following four schedules; 1) reinforcement administered 100% of the time noncontingently, 2) reinforcement administered 50% of the time randomly, 3) reinforcement administered contingently, or 4) the control groups which did not experience Phase 1 testing. Due to previous research (Thorton & Jacobs, 1971) which failed to find a helplessness effect when experimenters, experimental rooms, and tasks where changed between tasks, the present study also took steps to separate the treatment and testing phases in an effort to demonstrate that the learned helplessness effect could transfer across situational and environmental differences. When recruited, the subjects were informed that since two graduate students were conducting studies at the same time, it was requested that they participate in both studies to save them the time and effort of coming twice. Each phase of the experiment was conducted in different rooms by different experimenters. To eliminate possible experimenter confounding, the sex of the experimenters and subjects were counter-balanced. All testing was conducted within a four day period between the hours of 8 am and 5 pm. Verbal reinforcement consisted of one of three phrases used interchangably; "very good", "excellent", or "you do this very well". Concrete reinforcement consisted of poker chips which could be exchanged at the end of each phase for various prizes such as free food, movie passes, free bowling, etc.

Each subject initially reported to a central check-in room. At this time the subjects were directed to one of four testing rooms where an experimenter administered the Phase 1 task. After completion of this task the subject was thanked and sent back to the room to which they had initially reported. If the subject received concrete reinforcement they then exchanged their chips for prizes. Each subject was then directed to the second testing room for Phase 2 testing. After completion of this task, they were again thanked for participating (concrete subjects again traded in their chips). After filling out a short questionnaire to delineate attributional factors, the subjects were allowed to leave.

CHAPTER 3

RESULTS

It will be recalled that during Phase 1, subjects were exposed to either contingent reinforcement, 50% random reinforcement, or 100% noncontingent reinforcement, with the exception of the control group, which did not participate in the Phase 1 task. No data was collected during Phase 1 since it was considered to be the application of the treatment, or independent variable. It will be further recalled that Phase 2 testing consisted of a letter/number substitution task, which had each subject find the missing symbol of a group of three. The total number of errors and omissions were recorded for each subject. The Phase 2 means for the respective groups are presented in Table 1 below.

Table 1

	100%	50%	Contingent	Control
Concrete	68.25	77.58	55.50	59.67
Verbal	67.67	64.58	56.17	52.91
SUMS	135.92	142.16	111.67	112.58

These total scores were further subjected to a 2 x 4 factorial analysis of variance. More specifically, this analysis included two between-subjects factors (Concrete vs. Verbal, and Groups: control, contingent reinforcement, 50% random reinforcement and 100% noncontingent reinforcement). The results of this analysis indicated that there was no significant difference between concrete and verbal reinforcement, $\underline{F}(1,88) = 1.05$, $\underline{p} > .25$. Furthermore, the interaction between type of reinforcement and groups proved to be nonsignificant, $\underline{F}(3,88) = .47$, $\underline{p} > .25$. There was, however, a significant difference between the respective groups, $\underline{F}(3,88) = 2.88$, $\underline{p} < .05$. These results are summarized in Table 2.

Table 2

ANOVA - Phase 2

	ss	df	ms	F
Concrete vs. Verbal (A)	555.04	1	555.04	1.05 n.s.
Groups (B)	4551.38	3	1517.13	2.88 $\underline{p}$ <.05
A x B	746.54	3	248.85	.47 n.s.
Error	46298.00	88	526.11	-
Total	52146.96	95		

The Newman-Keuls procedure was employed to probe the significant group effects and to ascertain specific group differences. The results of this analysis indicated that those subjects receiving the 100% noncontingent reinforcement and those subjects receiving 50% random reinforcement made significantly ($\underline{p} < .05$) more errors than did the control and contingent reinforcement groups. There was no significant difference between either the 100% noncontingent and the 50% random reinforcement groups, or between the control and contingent reinforcement groups.

CHAPTER 4

DISCUSSION

The results clearly indicate that noncontingent, positive reinforcement can induce a learned helplessness effect in human adults (i.e., demonstrate decreased performance on a subsequent task). These findings, however, must be examined in terms of compatibility with alternate explanations. Are the results of this study reconcilible with the previously cited research which proposed alternative theories to explain the learned helplessness phenomenon?

To begin with, this study is obviously in contrast with the alternate theories which involve the effects of electric shock on catecholimine levels (e. g., Weiss et al., 1975; Anisman, Remington, & Sklar, 1979) since it would seem highly questionable that positive reinforcement would lead to lower levels of brain norepinephrine. Furthermore, even discounting the strong evidence of methodological inconsistancies already listed above, these alternatives(Weiss et al., 1975; Anisman et al., 1979) can not even explain the results of other studies using aversive stimuli, such as Hiroto and Seligman (1975), which successfully employed inescapable loud noise to produce a helplessness effect. Finally, even if the above explanations contain some amount of validity, the relevance to humans is rather dubious, It is extremely unlikely that exposure to inescapable shock is an occurrence experienced by even a minute fraction of mankind. While the benefits and importance of comparative experimental psychology are obvious, surely, in light of the voluminous amount of data accummulated concerning learned helplessness, it is time to evaluate the theory in terms of its ability to predict human behavior in a natural environmental setting.

There are several studies which do offer alternative explanations more generalizable to the human experience. First, Langer and Benevento (1978) suggested that the learned helplessness phenomenon was actually "self-induced dependence." They state that when exposed to a learned helplessness paradigm, "an individual erroneously infers incompetence from interpersonal situational factors." Implicit in this notion is the "assumption that people do not carry with them a stable sense of their own abilities. Instead, one's self estimate and consequent performance are dependent on situational factors that may override prior history of success " (p. 887). In a similar vein, Frankel and Snyder (1978) proposed that "giving unsolvable problems to people may lead them to believe not only that outcomes are independent of responses, but also that they have failed their assignment." The authors go on to suggest that a lack of motivation produces the performance deficit and "is the result of motivation to protect self-esteem." They hypothesize that "problem solving ability is pertinent to the self-esteem of most college students' and that failure is first attributed to the person and secondly, this attribution is made relevant to that person's self-esteem." Again, the present study provides evidence which is contrary to both of these hypotheses since it is doubtful that 100% noncontingent reinforcement would produce either a sense of incompetence (Langer & Benevento, 1978) or a loss of self-esteem (Frankel & Snyder, 1978). In summary, the present study not only strongly supports the main component of learned helplessness theory, uncontrolability, but also provides evidence which is in direct opposition with most of the aforementioned alternate theories.

Before continuing further, it should be noted that one finding proved to be inconsistent with prior research. This study found that the 50% random reinforcement group produced a greater deficit in the dependent variable than did the 100% noncontingent reinforcement group. Previous research using positive reinforcement in a learned helplessness paradigm found the opposite results (Seybert et al., Note 1; Seybert et al., Note 2). There are several possible reasons for this inconsistancy. The first may be inherent in the different populations employed. The adults may have been more wary and attributed the 100% noncontingent reinforcement to experimental manipulation, although this is not supported by the results of the post-test questionnaire. Perhaps the cause is of a more elementary nature. Basic learning theory postulates that partial reinforcement promotes stronger learning than does continuous reinforcement. Why this postulate was not in evidence in the previously cited research with children (Seybert et al., Note 1; Seybert et al., Note 2) would require further research. In any case, the difference was not statistically significant and therefore the interest in this isolated finding may be minimal.

A result of perhaps greater interest, and certainly more applicability to real life situations, concerns the second variable of verbal versus concrete reinforcement. This result showed that both the verbal and the concrete noncontingent reinforcement (i.e., the 50% random and the 100% noncontingent groups) produced statistically equivalent numbers of errors and omissions on the subsequent letter/digit substitution task. As suggested above, this variable was of particular relevance to the classroom since most teachers use verbal reinforcement to reward their students, and virtually all the research in learned helplessness using positive reinforcement has employed concrete reward. Therefore, the concurrent comparison of these two reinforcement types made by the present study provides a valuable first link between these two bodies of literature, i.e., learned helplessness and the educational failure research. More specifically, as cited previously, Griffith (1977) produced a performance deficit on a later task by introducing non-contingent verbal feedback, while Seybert et al. (Note 1) demonstrated a similar effect using noncontingent, positive, concrete reinforcement.

In summary, the data produced by the present study definitely support learned helplessness theory as a viable explanation of the observed phenomenon, and as previously stated, also provides evidence which contradicts several of the proposed alternative explanations. Based on the results of the present study, there are several directions future research can take. The first step, of course, is a replication from an independent source. Several possible extended replications might be pursued. For example, it would be of interest to further delineate specific effects within the concrete/verbal variable (e.g., monetary reward vs. prize vs. single verbal feedback vs. multiple verbal feedback, etc.). Another possibility would be to employ different tasks for both the independent and dependent variables (e.g., anagrams and/or pencil mazes). Valuable information could be obtained by research investigating the question of immunization of learned helplessness induced by noncontingent positive reinforcement. If this proved to be the case, a further study examining the task specific nature of such immunization might be productive (e.g., would exposure to a contingent anagram task immunize a subsequent letter/digit coding task against a noncontingent pencil maze task). Experiments designed to answer these, and other similar questions, will aid in determining the limits of the learned helplessness phenomenon as it applies to human experience. Hopefully such research will provide empirical evidence that will aid in the understanding and prediction of the helplessness phenomenon.

REFERENCE NOTES

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1. Seybert, J. A., Wilson, M. A., & Vandenberg, G. L. Appetetive learned helplessness in children. Paper presented at the 86th Annual Meeting of the American Psychological Association, 1978.

2. Seybert, J. A., Gilliland, J. W., Wilson, M. A. McClanahan, L. G., & Vandenberg, G. L. Immunization of learned helplessness in children. Paper presented at the Annual Meeting of the Midwestern Psychological Association, 1980.

3. Seybert, J. A., Gilliland, J. W., & Attwood, D. Reward produced helplessness in children: Effects of sex and the perception of contingency. Paper presented at the Annual Meeting of the American Psychological Association, 1980.

4. Seybert, J. A. Effects of unconditional positive reward (Learned Helplessness) in children. Paper presented at the 1981 Kansas Student's Contributions to Psychology Convention, 1981.

REFERENCES

REFERENCES

Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychology, 1978, 87, 49-74.

Andrews, R. J. The selfcomcept and pupils with learning difficulties. Slow Learning Child, 1966, 13, 47-54.

Anisman, H., Remington, G., & Sklar, L. S. Effect of inescapable shock on subsequent escape performance: catecholaminergic and cholinergic mediation of response initiation and maintenance. Psychopharmacology, 1979, 61, 107-124.

Anisman, H., & Sklar, L. S. Catecholamine depletion in mice upon reexposure to stress: Mediation of the escape deficits produced by inescapable shock. Journal of Comparative and Physiological Psychology, 1979, 93, 610-625.

Baker, A. G. Learned irrelevance and learned helplessness: Rats learn that stimuli, reinforcers, and responses are uncorrelated. Journal of Experimental Psychology: Animal Behavior Processes, 1976, 2, 130-142.

Barlow, J. J., & Sanders, G. D. Intertrial interval and passive avoidance learning in Octopus (vulgairs). Animal Learning and Behavior, 1974, 2, 86-88.

Bintz, J. Between- and within-subject effect of shock intensity on avoidance in goldfish (carassius auratus). Journal of Comparitive and Physiological Psychology, 1971, 75, 92-97.

X Black, A. H. Comments on "Learned helplessness: Theory and evidence" by Maier and Seligman. Journal of Experimental Psychology: General, 1977, 106, 41-44.

Barcewell, R. J., & Black, A. H. The effects of restraint and noncontingent pre-shock on subsequent escape learning in the rat. Learning and Motivation, 1974, 5, 53-69.

Braud, W., Wepman, B., & Russo, D. Task and species generating of the "helplessness" phenomenon. Psychonomic Science, 1969, 16, 154-155.

Butkowsky, I. S., & Willows, D. M. Cognitive motivational characteristics of children varying in reading ability: Evidence for learned helplessness in poor readers. Journal of Educational Psychology, 1980, 72, 408-422.

Carman, J. B. Acquisition and extinction of shuttlebox avoidance in chinchilla (Chinchilla lanigera). Psychological Reports, 1974, 35, 99-105.

Church, R. M., LoLordo, V. M., Overmier, J. B., Soloman, R. L., & Turner, L. H. Cardiac responses to shock in wrarized dogs: Effects of shock intensity and duration, waring signal, and prior experience with shock. Journal of Comparitive and Physiological Psychology, 1966, 62, 1-7.

Cohen, P. S. Interference effects of escapable shock upon subsequent acquisition of escape-avoidance responding. Journal of Comparitive and Physiological Psychology, 1970, 71, 484-486.

Cromwell, R. L. A social learning approach to mental retardation. In N. R. Ellis (Ed.), Handbook of Mental Deficiency. New York: McGraw-Hill, 1963.

D'Amato, M. Delayed matching and short-term memory in monkeys. In G. H. Bower, (Ed.), The Psychology of Learning and Motivation (Vol. 7). New York: Academic Press, 1973.

Dweck, L. S., Davidson, W., Nelson, S., Enna, B. Sex differences in learned helplessness: II. The contingencies of evaluative feedback in the classroom and III. An experimental analysis. Developmental Psychology, 1978, 14, 268-276.

Eisenberger, R., Kaplan, R. M., & Singer, R. P. Decremental and nondecremental effects of noncontingent social approval. Journal of Personality and Social Psychology, 1974, 30, 716-722.

Frank, M. L. A test of learned inactivity as an alternative to learned helplessness. Dissertation Abstracts International, 1977(Nov.), 38(5-B), 2396-2397.

Frankel, A., & Snyder, S. L. Poor performance following unsolvable problems: Learned helplessness or egotism? Journal of Personality and Social Psychology, 1978, 36, 1415-1423.

Gampel, E. S. Learned helplessness and its positive analogue. Dissertation Abstracts International, 1976 (Sep), 37(3-B), 1458.

Glazer, H. I. & Weiss, J. M. Long-term interference effect: An alternative to "Learned Helplessness". Journal of Experimental Psychology: Animal Behavior Processes, 1976, 2, 202-213.

Goodkin, F. Rats learn the relationship between respondind and environmental events: An expansion of the learned helplessness hypothesis. Learning and Motivation, 1976, 7, 382-393.

Griffith, M. Effects of noncontingent success and failure on mood and performance. Journal of Personality, 1977, 45, 442-457.

Hanusa, B. H., & Schulz, R. Attributional mediators of learned helplessness. Journal of Personality and and Social Psychology, 1977, 35, 602-611.

Herman. Z. The effects of noradrenaline on rat's behavior. Psychopharmacologia, 1970, 16, 369-374.

Hiroto, D. S., & Seligman, M. E. P. Generality of learned helplessness in man. Journal of Personality and Social Psychology, 1975, 31, 311-327.

Hulse, S. H. Patterned reinforcement. In G. H. Bower (Ed.), The Psychology of Learning and Motivation: Advances in Research and Theory: VII. New York, N. Y.: Academic Press, 1973.

Kacher, D. A. Learned helplessness: Cognitive, behavioral, and emotional outcomes of exposure to insolvable problems. Dissertation Abstracts International, 1978 (Jun.), 38(12-B), 6119-6120.

Killen, P. R. Superstition: A matter of bias, not detectability. Science, 1978, 199, 88-90

Kleinhammer, P. J., Tramill, J. L., & Davis, S. F. Learned helplessness in learning disabled adolescents as a function of non-contingent reinforcement. Learning Disabilities Quarterly, in press.

Langer, E. J., & Benevento, A. Self-induced dependence. Journal of Personality and Social Psychology, 1978, 36, 886-893.

Levis, D. J. Learned helplessness: A reply and an alternative S-R interpretation. Journal of Experimental Psychology: General, 1976, 105, 47-65.

Maier, S. F., Albin, R. W., & Testa, T. J. Failure to learn to escape in rats previously exposed to inescapable shock depends on nature of escape response. Journal of Comparative and Physiological Psychology, 1973, 85, 581-592.

Maier, S. F., & Seligman, M. E. P. Learned helplessness: Theory and evidence. Journal of Experimental Psychology: General, 1976, 105, 3-46.

Nadelman, A. S. Effects of uncontrollable reward on children's behavior on cognitive tasks. Dissertation Abstracts International, 1978 (Jul), 39(1-B), 391.

O'Rourke, T. M. Depression and positive reinforcement: Learned helplessness and behavioral hypothesis' compared. Dissertation Abstracts International, 1978 (Jun), 38(12-B), 6167-6168.

Overmier, J. B., & Seligman, M. E. P. Effects of inescapable shock upon subsequent escape and avoidance learning. Journal of Comparative and Physiological Psychology, 1967, 63, 23-33.

Richardson, A. M., & Julian, S. M. Avoidance learning in the lizard (Dipsosaurus dorsalis). Psychological Reports, 1974, 35, 35-40.

Riege, W. H., & Cherkin, A. Memory performance after flurothyl treatment in rainbow trout. Psychopharmacologia, 1976, 12, 31-35.

Rusiniak, K. W., & Gustavson, C. R., Hawkins, W. G., Garcia, J.. Prey-lithium, aversion: II. Laboratory rats and ferrets. Behavioral Biology, 1976, 17, 73-85.

Seligman, M. E. P. & Beagley, G. Learned helplessness in the rat. Journal of Comparative and Physiological Psychology, 1975, 88, 534-541.

Seligman, M. E. P., & Maier, S. F. Failure to escape traumatic shock. Journal of Experimental Psychology, 1967, 74, 1-9.

Seligman, M. E. P., Rosellini, R. A., & Kozak, M. Learned helplessness in the rat: Reversibility, time course, and immunization. Journal of Comparative and Physiological Psychology, 1975, 88, 542-547.

Seward, J. P., & Humphrey, G. L. Avoidance learning as a function of pretraining in the cat. Journal of Comparative and Physiological Psychology, 1967, 63, 338-341.

Siegel, R. K., & Jarvik, M. E. Learning in the land snail (Helix aspersa Muller). Bulletin of the Psychonomic Society, 1974, 4 (5-H), 476-478.

Solomon, R. L. & Wynne, L. C. Traumatic avoidance learning: acquisition in normal dogs. Psychological Monograms, 1953, 67, No. 354.

Spear, N. E. Retrieval of memory in animals. Psychological Review, 1973, 80, 163-194.

Thorton, J. W. & Jacobs, P. D. Learned helplessness in human subjects. Journal of Experimental Psychology, 1971, 87, 369-372.

Weiss, J. M., Glaser, H. I., & Pohorecky, L. A. Coping behavior and neurochemical changes: An alternative explanation for the original "learned helplessness" experiment. In G. Serban & A. Kling (Eds.), Animal Models in Human Psychobiology. New York: Plenum Press, 1976.

Weiss, J. M., Stone, E. A., & Harrell, N. Coping behavior and brain norepinephrine in rats. Journal of Comparative and Physiological Psychology, 1970, 72, 153-160.

Weisz, J. R. Perceived control and learned helplessness among mentally retarded and nonretarded children: A developmental analysis. Developmental Psychology, 1979, 15, 311-319.

Weisz, J. R. Learned helplessness in black and white children identified by their schools as retarded and nonretarded: Performance deterioration in response to failure. Developmental Psychology, 1981, 17, 499-508.

Welker, R. E. "Learned laziness": A replication and extension. Unpublished doctoral dissertation, University of Colorado, 1974.

Willard, S. P. Effects of physostigmine on avoidance conditioning and retention in the isolated cockroach (ganglion). Dissertation Abstracts, International, 1975, 36 (3-B), 1485.

Wortman, C. B. Some determinants of perceived control. Journal of Personality and Social Psychology, 1975, 31, 282-294.

Wortman, C. B., Panciera, L., Shusterman, L., & Hibscher, J. Attributions of causality and reactions to uncontrollable outcomes. Journal of Experimental Social Psychology, 1976, 12, 301-316.

Zigler, E. The retarded child as a whole person. In H. E. Adams and W. K. Boardman (Eds.), Advances in experimental clinical psychology. Elmsford: New York: Pergammon press, 1971.