Journal of Personality and Social Psychology
1975, Vol. 31, No. 2, 311–327

Generality of Learned Helplessness in Man

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Learned helplessness, the interference with instrumental responding following inescapable aversive events, has been found in animals and man. This study tested for the generality of the debilitation produced by uncontrollable events across tasks and motivational systems. Four experiments with college students were simultaneously conducted: (a) pretreatment with inescapable, escapable, or control aversive tone followed by shuttlebox escape testing; (b) pretreatment with insoluble, soluble, or control discrimination problems followed by anagram solution testing; (c) pretreatments with inescapable, escapable, or control aversive tone followed by anagram solution testing; (d) pretreatments with insoluble, soluble, or control discrimination problems followed by shuttlebox escape testing. Learned helplessness was found with all four experiments: Both insolubility and inescapability produced failure to escape and failure to solve anagrams. We suggest that inescapability and insolubility both engendered expectancies that responding is independent of reinforcement. The generality of this process suggests that learned helplessness may be an induced "trait."

Inescapable aversive events presented to animals or to men result in profound interference with later instrumental learning (e.g., Hiroto, 1974; Overmier & Seligman, 1967; Seligman & Maier, 1967; Thornton & Jacobs, 1971). If a subject can escape the aversive event, later instrumental behavior remains normal. This phenomenon has been interpreted as learned helplessness (Maier, Seligman, & Solomon, 1969; Seligman, Maier, & Solomon, 1971). This interpretation claims that organisms learn that responding and reinforcement (e.g., shock termination) are independent when shock is inescapable. Such learning undermines the motivation for initiating instrumental responses.

Is learned helplessness a specific state which only impairs performance in situations similar to original training, or does it impair a broad range of behavior? It is possible that specific environmental cues of training mediate the interference. In contrast, Hiroto (1974) and Miller and Seligman (1973) hypothesized that expectancy of independence is an internal state of the organism that is broadly transferred.

If interference with learning occurs following uncontrollable events from very different response and stimulus modalities, learned helplessness would seem to be a stable and pervasive process. To put it loosely, is learned helplessness a state or trait? This question is of particular interest since learned helplessness has been postulated as underlying human depression (Seligman, 1973, in press a; Seligman, Klein, & Miller, in press).

Hiroto (1974) reported results which demonstrated parallel behaviors between animals and man in a learned helplessness paradigm. One group received aversive loud noise which it could escape by button pressing. A second group received inescapable noise, and a third group received no pretreatment. All groups then received controllable noise in a two-way shuttlebox. As with animals, the inescapable group tended to sit and take the noise without responding, while the escape and no-pretreatment groups escaped readily. A personality measure, external control of reinforcement (Rotter, 1966), as well as the instructions of chance both produced passivity similar to the effects of inescapability. Hiroto

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The research reported in this article was conducted while the first author was a Postdoctoral Fellow at the University of Pennsylvania. This research was supported, in part, by National Institute of Mental Health Grant MH53982.

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This study is part of a program of research at the University of Pennsylvania supported, in part, by National Institute of Mental Health Grant MH19604 to Martin E. P. Seligman.

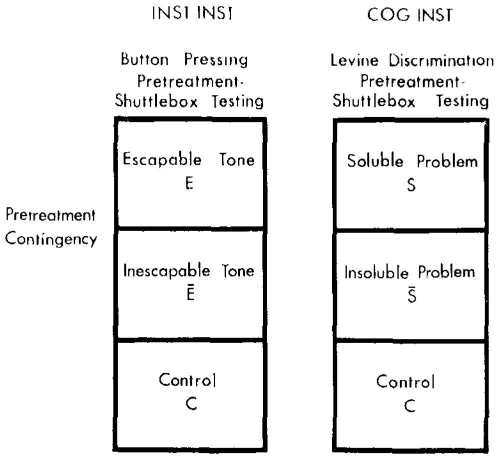

FIGURE 1. Designs of experiments. (Inst. refers to instrumental; Cog. refers to cognitive.)

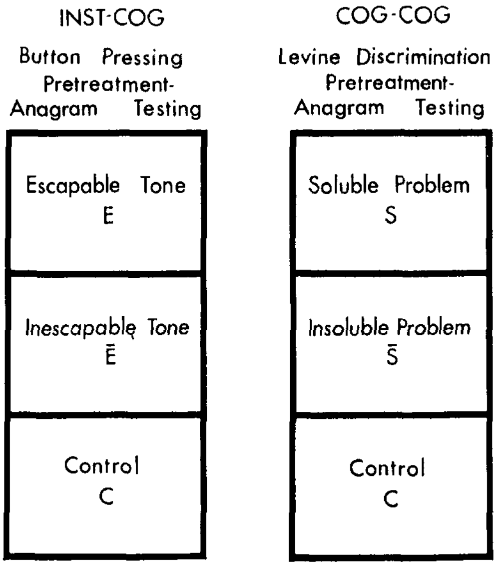

FIGURE 2. Designs of experiments. (Inst. refers to instrumental; Cog. refers to cognitive.)

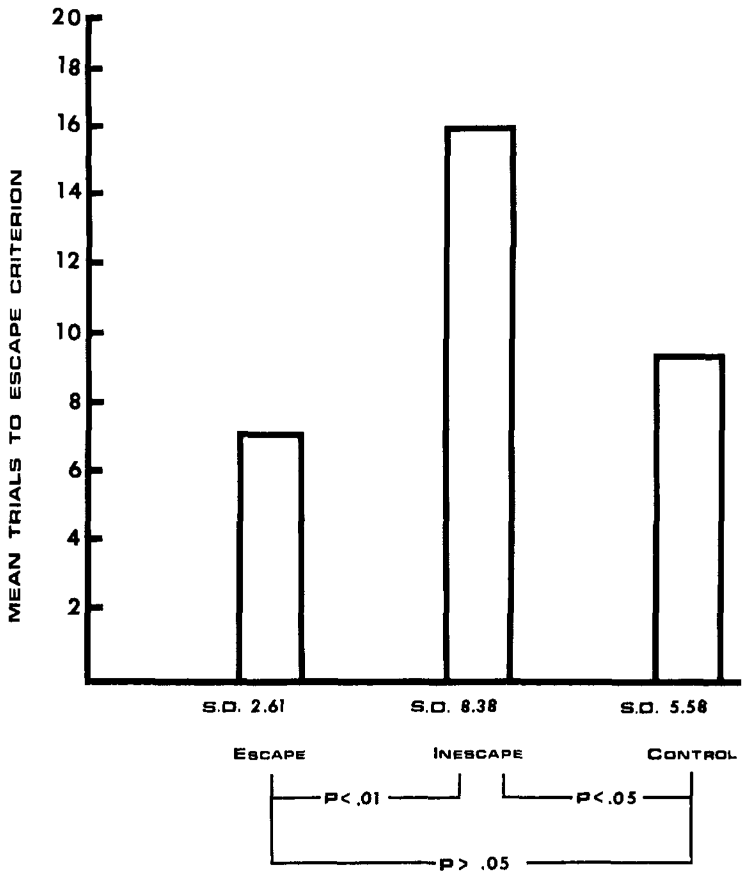

FIGURE 3. Group means, standard deviations, and significance levels of three dependent variables for the instrumental pretreatment-instrumental test for helplessness experiment: mean trials to criterion for escape acquisition.

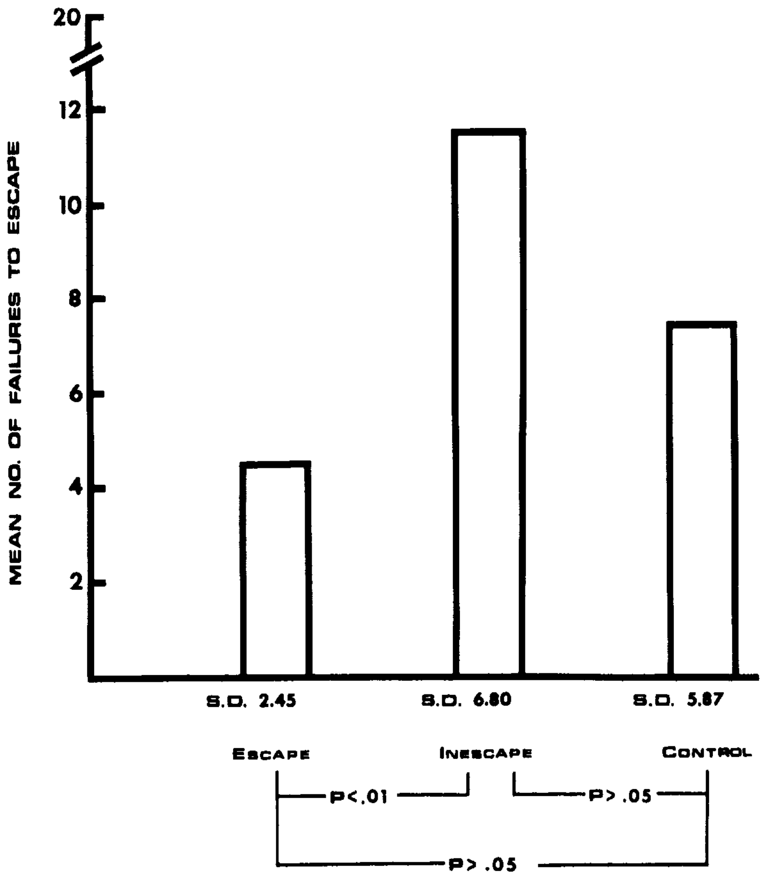

FIGURE 4. Group means, standard deviations, and significance levels of three dependent variables for the instrumental pretreatment-instrumental test for helplessness experiment: mean number of failures to escape.

concluded that all three variables—inescapability, externality, and chance instructions—engender a similar state, that is, the expectancy that reinforcement is independent of responding.

The Hiroto study, like most others in the helplessness literature, tested its subjects in a situation similar, but not identical, to the one in which helplessness is trained: Both training and testing used aversive loud noise and an instrumental problem. The study we report trains its subjects in either instrumental helplessness with loud noise or insoluble cognitive problems and then tests them in both new instrumental or cognitive problems which are soluble. It should be pointed out that insolubility in a cognitive task is formally analogous to inescapability, since in both the probability of reinforcement (correct or incorrect, or shock or no shock) is independent of responding. So we determine whether instrumental helplessness or mastery transfer to cognitive task and whether cognitive helplessness or mastery transfer to instrumental tasks.

METHOD

Overview

The study consisted of four independent, but simultaneously conducted, experiments. Two of the four experiments used an instrumental (Inst.) or cognitive (Cog.) pretreatment followed by an instrumental test for helplessness (Inst.-Inst., Cog.-Inst.). The other two experiments used an instrumental or cognitive pretreatment followed by a cognitive test for helplessness (Inst.-Cog., Cog.-Cog.). Each experiment consisted of three groups which received escapable (soluble), inescapable (insoluble), or a control pretreatment prior to the test for helplessness. Figure 1 presents the design for the Inst.-Inst. and Cog.-Inst. experiments, and Figure 2 presents the design for the Inst.-Cog. and Cog.-Cog. experiments.

Subjects

Ninety-six undergraduate students, consisting of 51 men and 45 women, at the University of Pennsylvania participated in the study. They responded to advertisements for a study in noise pollution and were advised prior to their participation that they might be exposed to a "slightly unpleasant" tone. Two women refused to participate and were replaced. None of the subjects had previously participated in an experiment using an aversive stimulus. Each subject was paid $2.00 at the end of the experiment and debriefed.

Apparatus

Instrumental pretreatment. The apparatus was a spring-loaded button in the center of a 12-in. (30 cm.) circular base. Symmetrically on each side of the button were two 24-V dc lights. In the escapable condition, pressing the button four times terminated the tone. In the inescapable condition the button had no effect on the tone.

Cognitive pretreatment. A series of four-dimensional stimulus patterns used in previous discrimination learning studies (Levine, 1966, 1971) was the cognitive task. Each of the four dimensions had two associated values: (a) letter (A or T); (b) letter color (black or white); (c) letter size (large or small); (d) border surrounding letter (circle or square). In the soluble condition, one value of one of the dimensions, for example, square border, was always correct. In the insoluble condition, no value was consistently correct. Levine (1971) provides a detailed description of the patterns. Each pattern was on a 4 × 6-in. (10 × 16 cm.) "wire-index" card.

Soluble instrumental test task. The apparatus was a modified Turner and Solomon (1962) human shuttlebox. Moving a knob from one side to the other escaped and avoided the tone. Specifications of the manipulandum have been described elsewhere (Hiroto, 1974).

The aversive stimulus in both instrumental tasks was a 3,000 hertz tone emanating from an Eico audio generator (Model 377). The tone was presented to the subject at 90 decibels through cali-

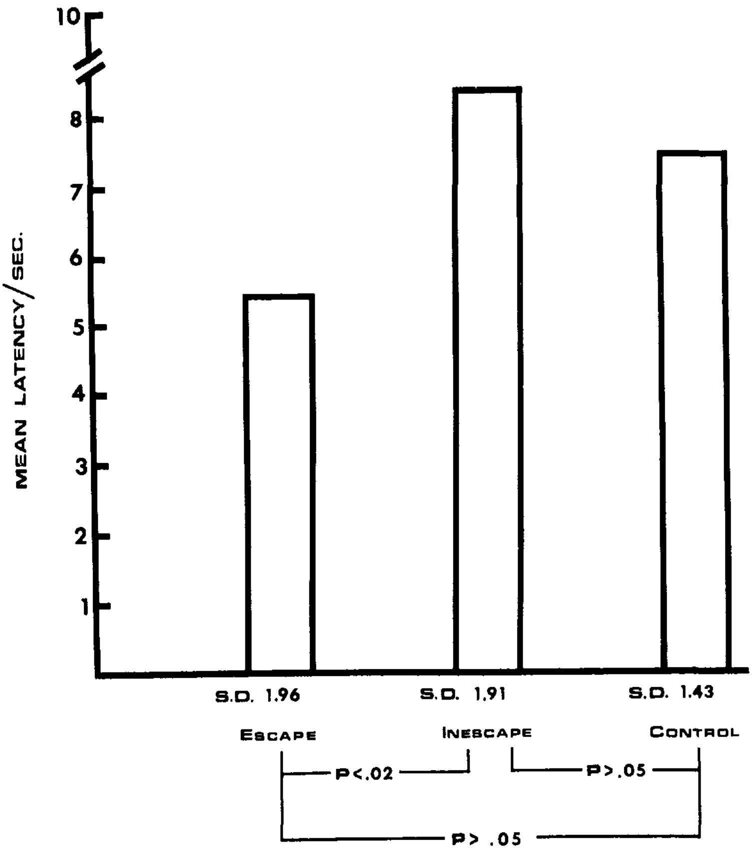

FIGURE 5. Group means, standard deviations, and significance levels of three dependent variables for the instrumental pretreatment-instrumental test for helplessness experiment: mean response latency.

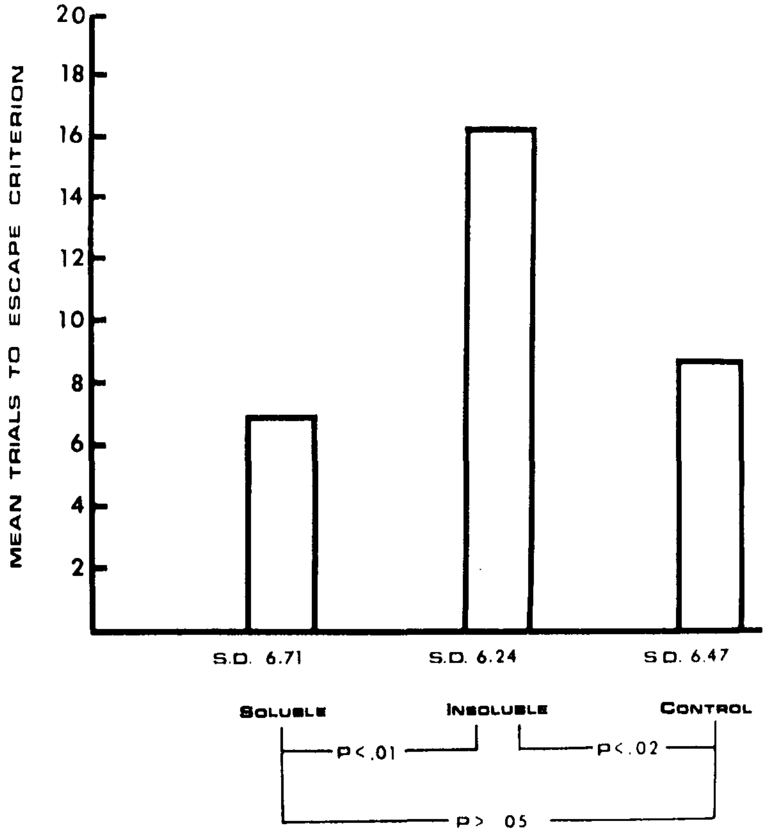

FIGURE 6. Group means, standard deviations, and significance levels of three dependent variables for the cognitive pretreatment-instrumental test for helplessness experiment: mean trials to criterion for escape acquisition.

brated Grason-Stadler earphones (Model TDH-39), and as we see the tone was generally judged "moderately aversive."

Soluble cognitive test task. A series of 20 anagrams taken from a list of five-letter anagrams (Tresselt & Mayzner, 1966) was used as the cognitive test task. The anagrams were placed individually on 4 × 6-in. (10 × 16 cm.) wire-index cards and composed of $\frac{1}{4}$ in. (.64 cm.) letters spaced $\frac{3}{16}$ in. (.48 cm.) apart. Examples of the anagrams were: (a) I A R D T; (b) B I A T H; (c) U L A T F; (d) E R L K C. The letter order for all anagrams was 3-4-2-5-1. This enabled us to look at both the time to solution of each anagram and trials to catching on to the pattern.

Communication between subject and experimenter was conducted with a two-way intercom. Controlling circuitry was located in an adjacent room separated by a one-way mirror. All response variables were measured by (1/100-sec.) times for the instrumental tasks and a (1/100-min.) stopwatch for the cognitive tasks.

Procedure

The subjects were assigned into 1 of the 12 possible groups generated by the four experiments each with the three pretreatment contingencies. The first study used an instrumental pretreatment (button press) followed by a second instrumental task (shuttlebox) to test for helplessness. The second study used a cognitive task (Levine discrimination problems) for the pretreatment followed by the instrumental task. The third and fourth studies used an instrumental and cognitive pretreatment task, respectively, and followed by the cognitive test task. There were 24 subjects in each experiment.

The three groups pretreated with the instrumental task were: (a) escapable (E) subjects who received 45 trials of unsignaled escapable noise; (b) inescapable yoked (Ē) subjects who received the identical 45 trials of unsignaled inescapable loud noise; and (c) control (C) subjects who passively listened to the identical number and duration of tones as E and Ē subjects. The C group differed from Ē group in that C was instructed merely to sit and listen to the tones, while Ē was instructed to try to terminate the tones (see "Instructions," below). Both C and Ē received identical patterns of tones, since we deemed it important that the inescapable group differ from the control group not in habituation to tone, but only in perceived inescapability (Geer, Davison, & Gatchel, 1970; Glass, Singer, & Friedman, 1969). The groups pretreated with the cognitive task were: (a) soluble (S) which received three soluble concept identification problems; (b) insoluble (S̄) which received three identical concept problems but with no consistent correct values; (c) control (C) which inspected the three problems but like the instrumental control group received no instructions to solve the problems and no feedback.

Instructions for instrumental pretreatment. The button press-shuttlebox and button press-anagram groups were pretreated with the same instrumental button pressing task. Each subject was initially informed that the study involved listening to noise and was given the option of leaving after listening to brief samples of the tone. The control groups were told only "From time to time a loud tone will come on for awhile. Please sit and listen to it." The E and Ē groups were told "From time to time a loud tone will come on for awhile. When that tone comes on there is something you can do to stop it." The function of the two lights on the apparatus was next described, but only to E and Ē groups.

> There are two lights located on this base. The lights will tell you how the noise on each trial was controlled. If you find the way to stop the noise then the green light marked '*S*-out' will momentarily flash on after each time you stop the loud tone. If you don't stop the tone then the red light marked 'time out' will flash when the tone stops. Remember, when the green light flashes on this means that you have stopped the tone. But if the red light flashes this means you did not stop the tone but that it stopped auto-

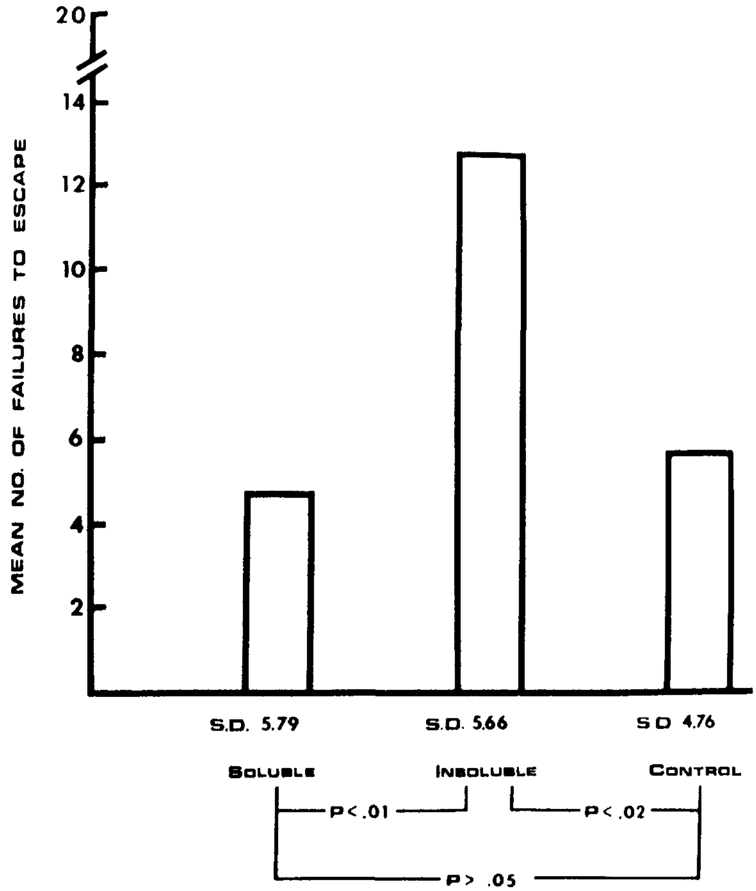

FIGURE 7. Group means, standard deviations, and significance levels of three dependent variables for the cognitive pretreatment-instrumental test for helplessness experiment: mean number of failures to escape.

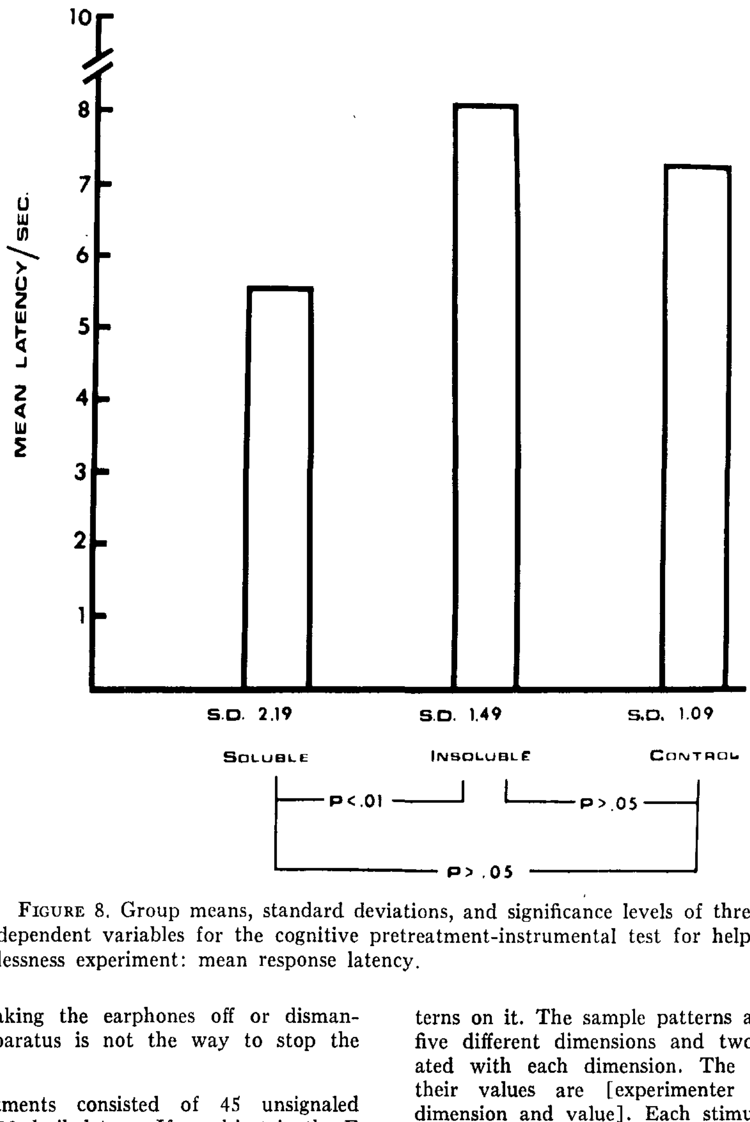

FIGURE 8. Group means, standard deviations, and significance levels of three dependent variables for the cognitive pretreatment-instrumental test for helplessness experiment: mean response latency.

matically. Taking the earphones off or dismantling the apparatus is not the way to stop the noise.

The pretreatments consisted of 45 unsignaled trials with the 90-decibel tone. If a subject in the E group failed to terminate the tone it lasted for 5 secs. The onset of the red (failure) light was correlated with the end of the 5-sec. interval. The onset of the green (success) light was correlated with subject's termination of the tone. The intertrial interval (*ITI*) ranged from 10 to 25 secs. with a 14-sec. mean *ITI*. Triads of subjects in all groups received identical, yoked durations of tone. At the conclusion of the pretreatments subjects rated the aversiveness of the tone.

Instructions for cognitive pretreatment. The Levine discrimination-anagram and Levine discrimination-shuttlebox groups received the following instructions to introduce the cognitive task:

In this experiment you will be looking at cards like this one. Each card has two stimulus patterns on it. The sample patterns are composed of five different dimensions and two values associated with each dimension. The dimensions and their values are [experimenter described each dimension and value]. Each stimulus pattern has one value from each of the five dimensions.

Here the C instructions ceased and the rest of the instructions were given to S and $\bar{S}$ groups.

I have arbitrarily chosen one of the ten values as being correct. For each card I want you to choose which side contains this value, and I will then tell you if your choice was correct or incorrect. In a few trials you can learn what the correct value is by this feedback. The object for you is to figure out what the answer is so you can choose correctly as often as possible.

Five sample trials of a single five-dimension problem was first presented. This clarified the task of finding the "correct" value. The C group was merely shown the sample trials without any clarifying instructions. All subjects were asked if there were any questions. No subject asked if the experimental problems were soluble or insoluble.

The experimental stimulus patterns were composed of four dimensions. Three different problems were presented in blocks of 10 trials each. At the end of each 10-trial problem S and S̄ groups were asked for the correct answer. The criterion for acquisition was subject identifying the correct value after each 10-trial block. Six subjects were discarded for not meeting criterion on all of the three problems and were subsequently replaced. The S̄ group received a predetermined schedule of "correct" and "incorrect" regardless of what value was guessed. In this manner reinforcements were independent and not contingent on the S̄ groups responding. The schedule of reinforcements were: (a) C-I-I-C-C-I-I-C-C-I for the first problem; (b) I-C-I-C-C-I-C-I-C-I for the second; and (c) I-C-I-C-I-C-C-I-C-I for the last problem. In addition, the S̄ group was told "that's the wrong answer" when subject tried to guess the correct value after each problem.

Instructions to the S and S̄ groups were "We are now starting a new problem. You do not know at this point if I have chosen a different value for this problem. I will continue telling you if you are correct or incorrect."

The C group was instructed to "Please continue studying each stimulus pattern carefully and turn each card when I ask you to."

The S and S̄ groups were allowed 10 secs. to make a decision before the experimenter warned them that a decision must be made within 5 secs. In other words, a trial could never be longer than 15 secs., but no subject took longer than 10 secs. on any trial.

Instructions for instrumental test trials. The instrumental test trials were conducted at a different location but within the same experimental room as the pretreatments. The manipulandum was covered until subject received the following instructions:

> You will be given some trials in which a relatively loud tone will be presented to you. Whenever you hear the tone come on there is some-

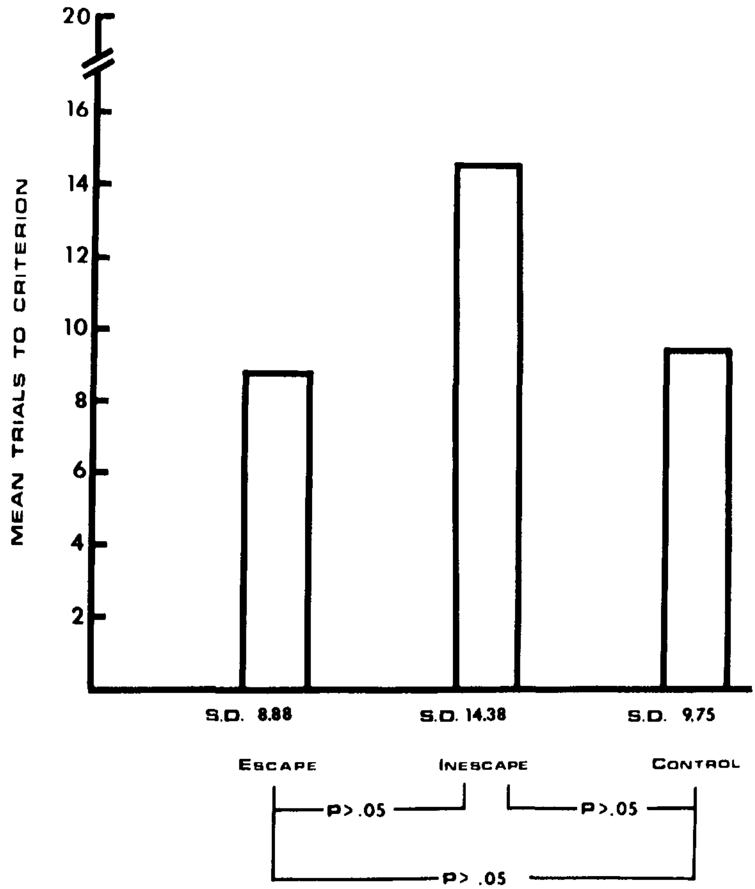

FIGURE 9. Group means, standard deviations, and significance levels of three dependent variables for the instrumental pretreatment-cognitive test for helplessness experiment: mean trials to criterion for anagram solution.

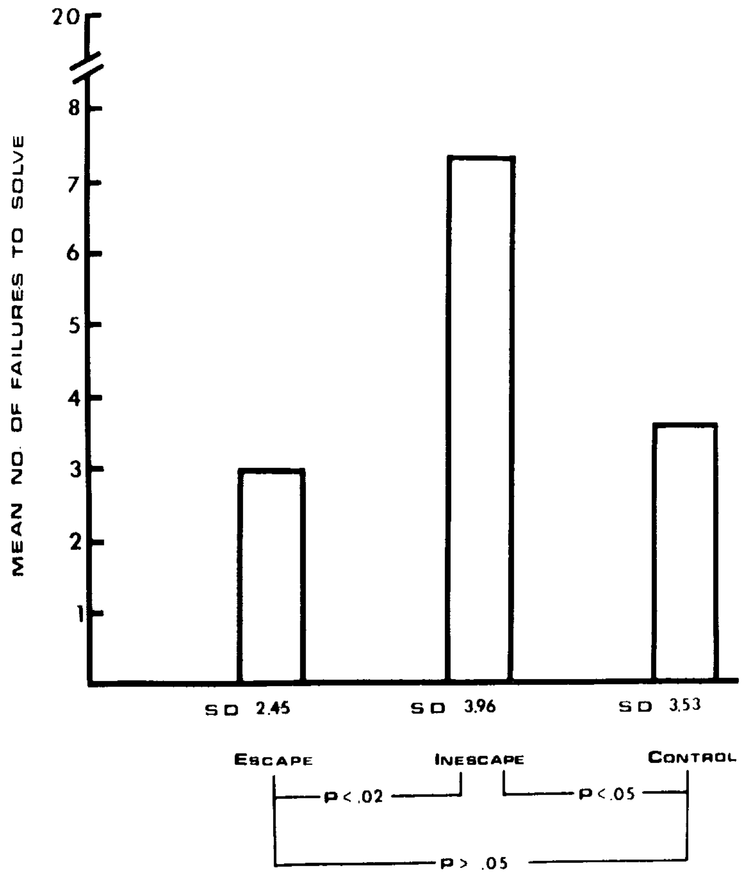

FIGURE 10. Group means, standard deviations, and significance levels of three dependent variables for the instrumental pretreatment-cognitive test for helplessness experiment: mean number of failures to solve.

thing you can do to stop it. Taking the earphones off or dismantling the apparatus is not the way to stop the noise. I'll answer all questions and pay you for your time at the completion of the study. Uncover the apparatus and we'll begin.

The sliding knob was always located at the midpoint of the manipulandum such that the subject could slide the knob with equal ease to either the left or right end of the box. A 24-V dc warning light at the midpoint of the manipulandum cover was on for 5 secs. before and terminated when the 5-sec. tone began. The test phase consisted of 20 signaled 10-sec. trials with the *ITI* ranging from 10 to 45 secs. and a mean *ITI* of 21 secs.

The appropriate response was moving the knob to one side of the manipulation to throw the microswitch controlling the stimulus light or noise. On the next trial, moving to the opposite side escaped or avoided the noise. The instructions specified escape contingencies only, but an avoidance response was possible by sliding the knob to the appropriate side before the noise began. A response latency under 5 secs. terminated the warning light and avoided the tone. If the subject did not terminate the light (latency less than 5 secs.) or escape the tone (between 5 to 9.99 secs.) a latency of 10 secs. was given for that trial. At the completion of the test phase subjects rated the unpleasantness of the 3,000 hertz tone and completed questionnaires relating to the pretreatment and test trials.

Instructions for cognitive test trials. The cognitive test was located in the same location as the instrumental test task. The following instructions introduced the trials:

You will be asked to solve some anagrams. As you know anagrams are words with the letters scrambled. The problem for you is to unscramble the letters so they form a word. When you've found the word tell me what it is over the intercom system. Now [subject's name], there could be a pattern or principle by which to solve the anagrams. But that's up to you to figure out. I can't answer any questions now. After the experiment is over I'll answer all questions and pay you for your time.

All 20 anagrams were soluble and had the same letter sequence. The anagrams could be solved individually; but the easiest method was to learn to use the letter sequence. The anagrams were selected such that only one word could be arranged with each anagram. But there were two instances in which subjects found additional words. The anagram B L O E N ("noble") was rearranged as "Nobel" by three subjects, but experimenter disqualified this answer since it was a proper name. On these occasions subject was asked to try again, and each subject eventually found the acceptable word. The anagram U N A T J ("jaunt") was seen as "junta" by three different subjects and scored as acceptable answers (experimenter was tempted to award these subjects a medal). In cases in which subject gave a nonsense word experimenter replied, "that's not a word, please try again."

Three dependent variables were analyzed on the instrumental and cognitive test tasks. The instrumental measures were: (a) trials to criterion for escape acquisition, defined as subject completing three consecutive escape responses; (b) number of failures to escape, defined as the number of trials with latencies of 10 secs.; and (c) the mean latency for the 20 trials. Three analogous measures were analyzed for the cognitive test task: (a) trials to criterion for anagram solution was defined as subject solving three consecutive anagrams in less than 15 secs. each. (Reaching this criterion meant that subject recognized the principle of fixed-letter sequence. The definition, although arbitrary, was highly reliable. When subject "caught on" to the anagram construction, latencies dropped dramatically from an average of 45 secs. to well below 15 secs.); (b) number of failures to solve, defined as the number of trials with latencies of 100 secs., the point at which the trial ended; (c) mean response latency for the 20 anagrams. The last two measures for the instrumental and cognitive tests parallel the indices reported in the human and animal learned helplessness literature.

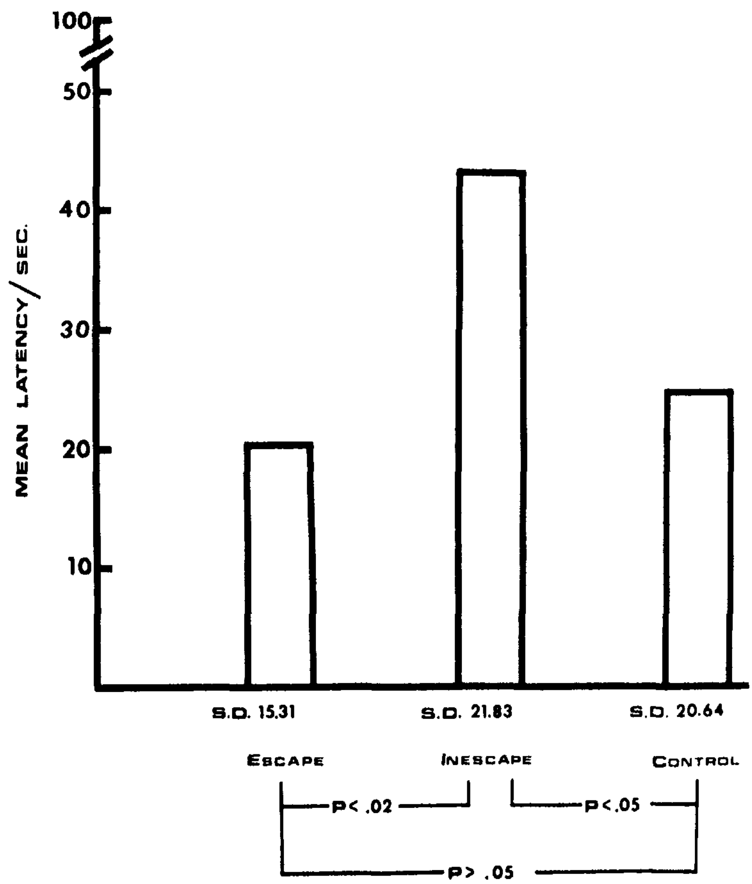

FIGURE 11. Group means, standard deviations, and significance levels of three dependent variables for the instrumental pretreatment-cognitive test for helplessness experiment: mean response latency.

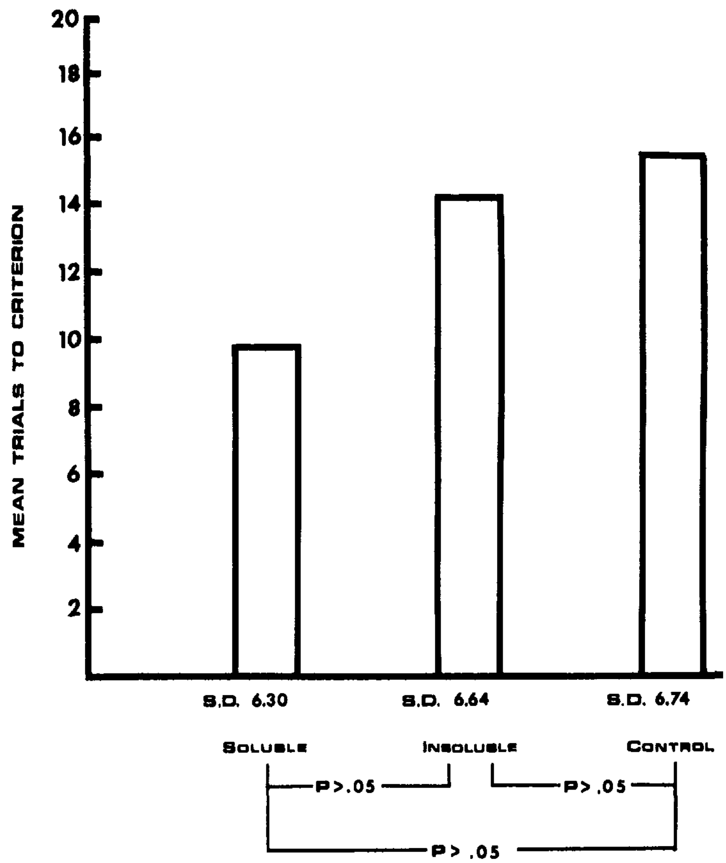

FIGURE 12. Group means, standard deviations, and significance levels of three dependent variables for the cognitive pretreatment-cognitive test for helplessness experiment: mean trials to criterion for anagram solution.

RESULTS

Overall, interference was produced by inescapability and insolubility in three of the four experiments: Inst.-Inst.; Inst.-Cog., Cog.-Inst. The Cog.-Cog. experiment did not show significant effects although the results were in the predicted direction.

Pretreatment Trials

All subjects who received the escapable or soluble pretreatments performed appropriately to the relevant contingencies during pretreatment. No significant differences in the number of trials to escape the tone by button pressing were found between the button-press escapable group followed by the instrumental task and the button-press escapable group followed by the cognitive test. Likewise, no differences appeared in solution of the Levine discrimination pretreatment between the soluble group followed by the cognitive test and the soluble group followed by the instrumental test (all ps $> .05$). All subjects in the escapable and soluble pretreatments reached the criteria of learning in pretreatment.

A check on the pretreatment manipulation was conducted to assess the effectiveness of the inescapability and insolubility manipulations. The subjects in the helplessness-induction groups (i.e., $\bar{E}$ and $\bar{S}$) believed they had no control over solution. Two items from a questionnaire relating to controllability in the pretreatment provided the relevant information. The items were worded to determine if subject attributed uncontrollability to himself or to the task. Question 1 asked if subject believed "you couldn't solve the problem" while the second asked if subject believed the "problem was unsoluble—that it couldn't be solved." Answers were recorded on a 7-point scale with higher scores denoting greater insolubility. All $\bar{E}$ and $\bar{S}$ groups believed they lacked the ability to solve their respective tasks relative to E and S groups. Subjects in the $\bar{E}$ groups had a mean rating of 4.4 on Question 1 and the $\bar{S}$ groups a rating of 4.9. This compares with a rating of 2.25 for the E groups. The difference between the pooled $\bar{E}$ and $\bar{S}$ groups versus pooled E and S groups was significant, $F(1, 62) = 43.54$, $p < .001$. In addition, the $\bar{E}$ and $\bar{S}$ groups believed the problem was unsolvable. The mean rating for $\bar{E}$ groups on Question 2 was 4.63 while the mean rating for $\bar{S}$ groups was 4.31; the E groups had a rating of 2.37 on the same question and S groups rated the question at 1.56. The difference between the pooled $\bar{E}$ and $\bar{S}$ versus pooled E and S groups was significant, $F(1, 62) = 5.13$, $p < .001$.

Helplessness Test Trials [1]

Inst.-Inst. The group pretreated with inescapable tone in button pressing escaped significantly more poorly in the shuttlebox than the escapable and control pretreated groups on all measures. Figures 3, 4, and 5 present these results and significance levels for trials

[1] Since it was predicted that groups pretreated with inescapability (insolubility) would demonstrate an interference to learning relative to groups without such pretreatments, the following statistical tests were one-tailed: E versus $\bar{E}$, $\bar{E}$ versus C, S versus $\bar{S}$, and $\bar{S}$ versus C; tests between escapable (soluble) and control pretreated groups were two-tailed: E versus C and S versus C.

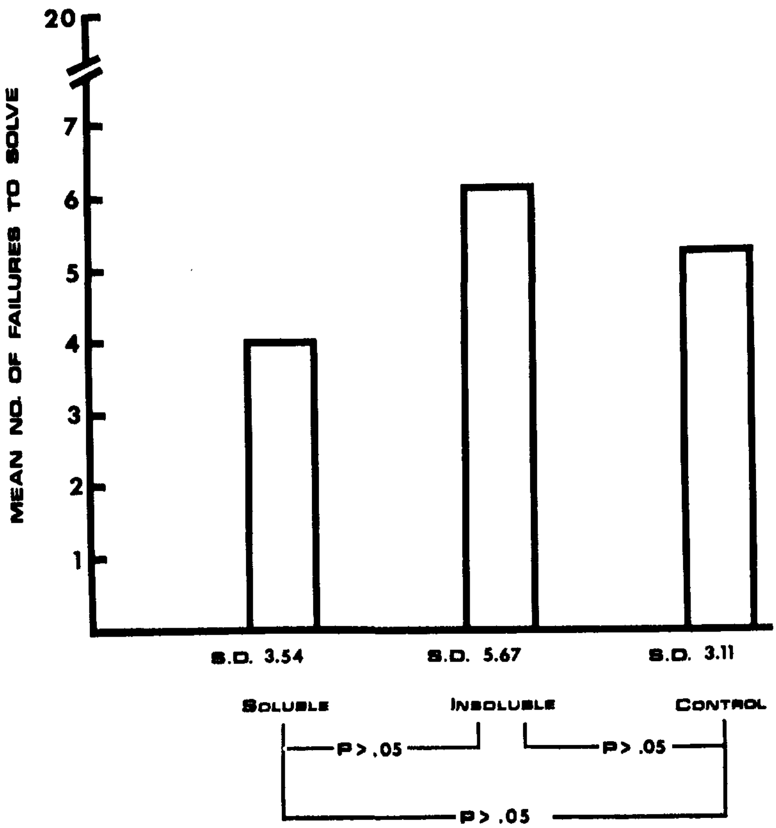

FIGURE 13. Group means, standard deviations, and significance levels of three dependent variables for the cognitive pretreatment-cognitive test for helplessness experiment: mean number of failures to solve.

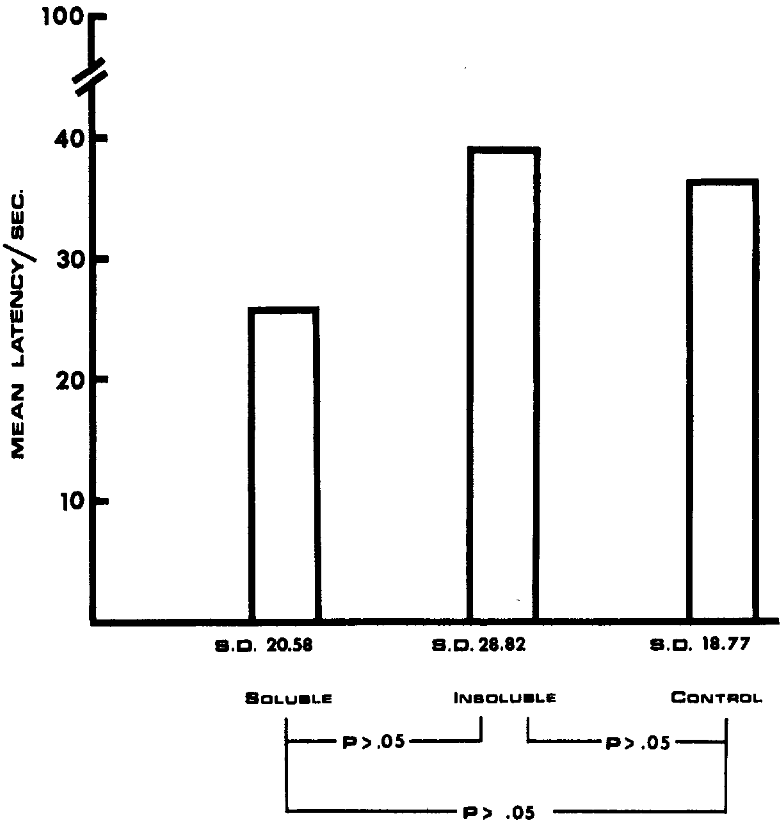

FIGURE 14. Group means, standard deviations, and significance levels of three dependent variables for the cognitive pretreatment-cognitive test for helplessness experiment: mean response latency.

to escape criterion, number of failures to escape, and mean latency.

Cog.-Inst. The group pretreated with insoluble discrimination problems did significantly worse on shuttlebox escape than the soluble and control pretreated groups in the shuttlebox. Figures 6, 7, and 8 present these results and significance levels for trials to escape criterion, number of failures to escape, and mean latency.

Inst.-Cog. The group pretreated with inescapable tone in button pressing generally was worse at solving anagrams than the soluble or control pretreated groups. Figures 9, 10, and 11 present these results and significance levels for trials to criterion for anagram solution, number of failures to solve, and mean latency.

Cog.-Cog. No significant differences were found on anagram performance following insoluble, soluble, or control discrimination problems. Figures 12, 13, and 14 present the trials to criterion for anagram solution, number of failures to solve, mean latency, and significance levels for anagram solution.

Questionnaire scores. The subjects pretreated with inescapable tone were yoked to subjects pretreated with escapable tone such that density, frequency, and duration of tone were equated. It is possible that differential subjective aversiveness of tone have produced the subsequent retarded performance. However, all subjects rated the pretreatment tone as moderately unpleasant on a 7-point scale. The pretreated E groups rated the tone at 3.91, while $\bar{E}$ groups rated the stimulus at 3.70. The C groups who passively listened to the 3,000 hertz tone rated the same stimulus somewhat lower at 3.14. These differences were not significant, $F(2, 45) = 1.02$, $p > .05$.

Additional post hoc comparisons on the questionnaires were conducted. There were no differences in "amount of trying" between pretreated groups in either the pretreatment or test trials ($p > .10$), nor did they change in amount of trying from pretreatment to test trials ($p > .10$). All subjects were asked if they felt "frustrated" during any part of the experiment. The $\bar{E}$ and $\bar{S}$ groups rated the pretreatment as more frustrating than the pooled E and S groups (4.5 vs. 2.2, respectively), $F(1, 62) = 42.3$, $p < .001$. Within the helplessness-induction groups two $\bar{S}$ pretreated groups indicated greater frustration than the two $\bar{E}$ pretreated groups (5.3 vs. 3.6, respectively), $F(1, 62) = 6.96$, $p < .018$.

Since only the cognitive pretreated group tested with anagrams failed to show helplessness, we repeated the Cog.-Cog. procedure with four insoluble Levine discrimination problems rather than three. The subjects, apparatus, and procedures were identical to the Cog.-Cog. experiment reported above, except that the $\bar{S}$ group ($n = 8$) received four 10-trial block insoluble problems, the S group ($n = 8$) received four soluble problems, and the C group ($n = 8$) looked passively at four 10-trial block problems without attempting solution.

When four insoluble problems were used interference with anagram solution was found. Figures 15, 16, and 17 present the trials to solution criterion, number of failures to solve, and mean latency to solution as well as significance levels for anagram performance of the three pretreated groups.

Discussion

There were three main findings of the experiment: (a) a group pretreated with an inescapable aversive tone showed greatly debilitated tone-escape performance in a shut-

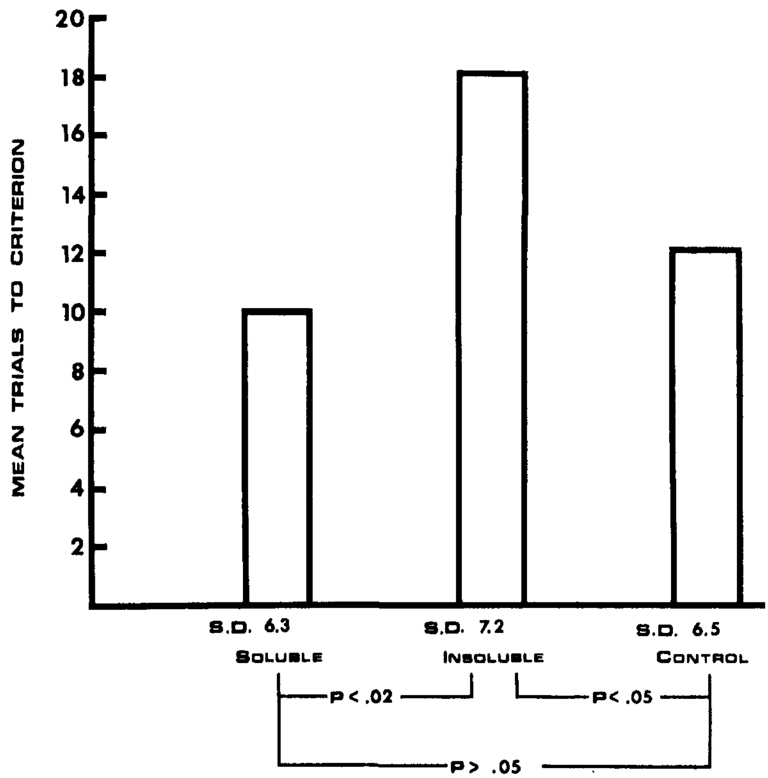

FIGURE 15. Group means, standard deviations, and significance levels of three dependent variables for the revised cognitive pretreatment-cognitive test for helplessness experiment: mean trials to criterion for anagram solution.

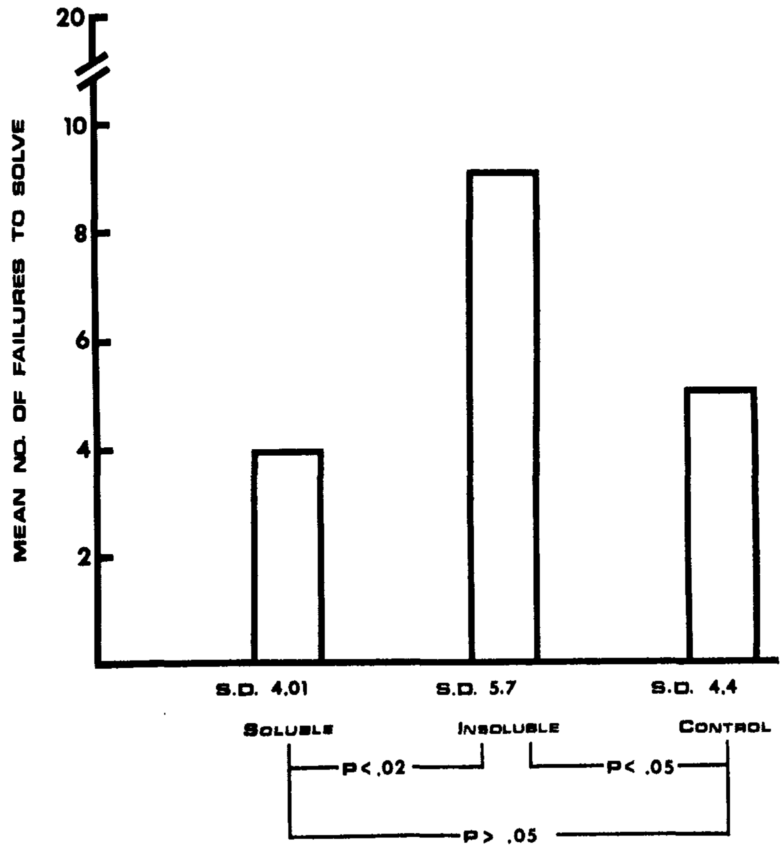

FIGURE 16. Group means, standard deviations, and significance levels of three dependent variables for the revised cognitive pretreatment-cognitive test for helplessness experiment: mean number of failures to solve.

tlebox; a control group and an escapable pretreated group performed well in shuttlebox escape. This replicates the findings of Hiroto (1974) and again demonstrates a learned helplessness phenomenon in man, directly parallel to learned helplessness in dogs, cats, and rats (cf. Seligman, in press b, for a cross-species review). (b) A group pretreated with four insoluble discrimination problems was debilitated at solving later anagrams relative to a control and soluble pretreated groups. This demonstrates that learned helplessness can be produced within cognitive tasks, without aversive unconditioned stimuli or instrumental components. (c) Cross-modal helplessness was also found. A group pretreated with insoluble cognitive problems was debilitated at instrumental escape. Interestingly, this group was just as debilitated as the group pretreated with instrumental inescapability. In addition, a group pretreated with inescapable tone was debilitated at anagram solution to the same extent as the group pretreated with four insoluble discrimination problems.

The finding of cross-modal helplessness is of considerable theoretical interest. Initially, critics of the animal helplessness findings argued that failure to escape in a shuttlebox following inescapable shock might have resulted from a competing motor response, rather than a more general "organismic" debilitation (e.g., Miller & Weiss, 1969). Maier (1970) and Seligman and Maier (1967) disconfirmed this peripheral interpretation by using very different training and testing situations. These situations, however, were similar at least in the fact that pretreatment and testing both involved the same unconditioned stimulus-shock-and instrumental re-

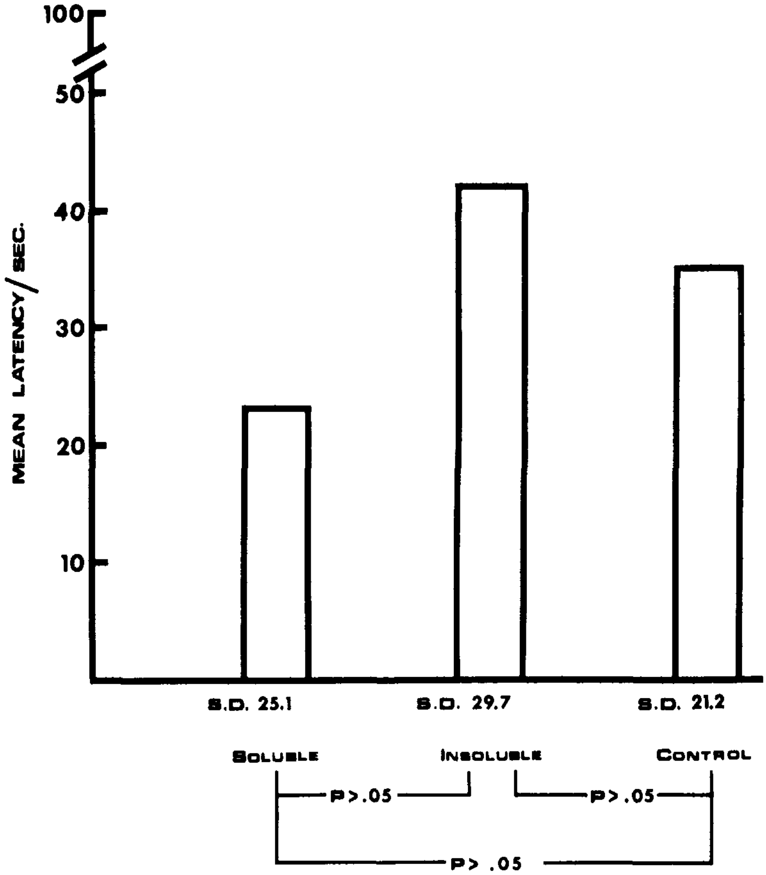

FIGURE 17. Group means, standard deviations, and significance levels of three dependent variables for the revised cognitive pretreatment-cognitive test for helplessness experiment: mean response latency.

sponding. Our present findings provide the coup de grace against any peripheralist interpretation. No competing motor response could generate cognitive interference from instrumental inescapability or instrumental interference from cognitive insolubility.

Alternatively, neither frustration, differential aversion of tone, nor demand characteristics (Orne, 1962) seem able to account for these differences. Frustration was experienced to a greater extent in the inescapable and insoluble pretreatments than in the soluble, escapable, or control pretreatment groups. Frustration is usually interpreted as energizing, rather than deenergizing, motivation (e.g., Amsel & Roussel, 1952). One can choose to interpret frustration post hoc as rigidifying rather than energizing responses, but then the explanation becomes difficult to differentiate from learned helplessness, which is not post hoc (e.g., Schmeck & Clements, 1971; Schmeck & Ribich, 1969). Since the groups all reported similar levels of aversiveness to the tone, this variable does not explain the findings. Finally, during our debriefing no subject gave evidence of having detected the purpose of the study or what was predicted of him.

One limitation on the generality of these effects should be mentioned. The subjects clearly perceived both tasks, as different as they are, as part of the same experiment. We do not know whether any learned helplessness was carried out of the laboratory. Future research with unobtrusive tests should determine the extraexperimental generality of our effects.

What is the process of learned helplessness, then? If the interference produced was both short-lived and highly specific to the conditions of training, we might call it a transient and peripheral "state." Since it is general across motivations and tasks, however, we suggest that the process induced by uncontrollability may be the rudiment of a "trait." Further research on the long-livedness of this process in humans may bear this out. At any rate the expectancy that responding and reinforcement are independent generalizes widely.

Seligman (1973, in press a) and Seligman et al. (in press) proposed that learned helplessness is a model for depression in man. This speculation entails the consequence that our procedure for producing debilitation should also produce those symptoms associated with mild depression: self devaluation, psychomotor retardation, feelings of sadness, etc. Future research should answer these questions.

In conclusion, we have produced learned helplessness in humans. The process engendered debilitates performance well beyond the condition under which helplessness is first trained. We suggest therefore that learned helplessness may involve a trait-like system of expectancies that responding is futile.

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(Received July 31, 1973)