

Escape and avoidance conditioning with omission of entertaining material as the aversive event¹

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Fifty-two college Ss were assigned to either an escape or an avoidance conditioning group. The maximum omission interval of the recorded material was 10 sec for both groups. For the escape group, a light was presented for a maximum interval of 3.0 sec immediately following the omission interval. For the avoidance group, the light was presented 3.0 sec prior to the recording omission. A panel depression was the required response. A significant trial blocks effect for number of responses was found in both the escape and avoidance conditioning groups.

The majority of experiments concerned with escape and avoidance conditioning of adult Ss have involved the presentation of such aversive stimuli as electric shock (e.g., Banks, 1965), loud tones (e.g., Porter & Dawley, 1966), and air puff (e.g., Moore & Gormezano, 1961). The onset of loud tones has also been employed as the aversive stimulus event in studies with children (e.g., Penney & Croskery, 1962, Penney & McCann, 1962).

In addition, the interruption of a pleasant or entertaining state of affairs has been demonstrated to be an effective procedure with children in free-operant escape and avoidance conditioning tasks. Jeffrey (1955) has shown that children as young as 3 years of age will learn to respond every 10 sec to continue listening to recorded music with a minimum of interruption. Baer (1960) obtained stable escape and avoidance responses in preschool Ss using the interruption of cartoons as the aversive event. However, the results of discrete-trial instrumental conditioning tasks using this methodology with children has not been as successful. Robinson & Robinson (1961) stated that the interruption of recorded stories and songs, by itself, did not constitute an effective aversive stimulus with preschool children. However, the authors did not state what criteria were used in determining the ineffectiveness of this type of stimulus event. Rainey (1966) investigated discrete-trial instrumental escape and avoidance conditioning in normal and retarded children matched on MA. The aversive event consisted of the interruption in viewing cartoons. The results indicated that, compared to

retarded Ss, normal Ss required fewer trials to condition in the escape task. With regard to the avoidance task, Rainey stated that, while avoidance responses were made by both normal and retarded Ss, the results were indefinite. The inconclusiveness was attributed to the mildness or "tolerability" of cartoon interruption as an aversive event for the Ss.

The purpose of the present study was to investigate the possibility that the interruption of an entertaining stimulus could function as an aversive event in discrete-trial escape and avoidance conditioning with adult Ss.

SUBJECTS

Fifty-two undergraduate Ss were employed in this study. All were enrolled in a summer session at the University of South Dakota and were under 30 years of age.

APPARATUS

The apparatus consisted of a gray wooden box, 8 x 12 x 3½ in. high. A microswitch was mounted in the midline of the top surface of the box, 3½ in. from the edge nearest the S. A hinged 5 x 4½ in. panel, with a green foam-rubber hand pattern centered on it, was placed over the microswitch. A spring, positioned directly in front of the microswitch, prevented activation of the microswitch by the weight of the hinged panel so that the microswitch was activated only when the S exerted a moderate amount of pressure on the panel. A 7½-W red light bulb was mounted 1 in. from the back edge of the top surface of the box.

Four Hunter decade interval timers were used to control the duration of the light signal, the duration of the interruption of the recorded material, the interstimulus interval (ISI), and the intertrial interval (ITI). A Hunter Klockounter was used to record response latencies to the nearest 0.01 sec. The recorded material was taped on a Roberts 770X stereo tape recorder, and was presented to the S on a Channel Master "Keynoter" tape recorder. This latter recorder was modified so that the tape continued to play without sound during the intervals in which the recorded material was interrupted. With this modification, the S actually missed a portion of the recorded material during the omission intervals. The recorded material was presented to the S through Sharpe HA-8 earphones.

The material taped for presentation was selected by two raters from Bill Cosby

record albums (Warner Bros. W1518, W1567, W1606), and was chosen for its humorous content and appropriateness. The 10 selections ranged in time from 0.58 sec to 5.58 min. The total duration of the recorded material was approximately 28 min.

DESIGN

Each S was assigned to either an escape or an avoidance group. Within each group, 13 Ss were male and 13 Ss were female. For Ss in the escape group, the maximum omission interval of the recorded material was 10 sec. Following the maximum omission interval of 10 sec, the light was activated for a maximum interval of 3 sec. The ITI, as measured from end of the maximum light interval to the omission of the recorded material on the next trial, was 10 sec. During the ITI, the recording played continuously. An escape response at any time within the omission interval immediately reinstated the recorded material. A response within the 3-sec interval in which the light was on terminated the light but did not affect the omission or reinstatement of the recorded material.

For Ss in the avoidance group, a delayed conditioning procedure was used in which the offset of the light and the recorded material occurred simultaneously. The maximum light duration was 3 sec. The maximum omission interval of the recorded material was 10 sec. The ITI, as measured from the end of the maximum omission interval to light onset for the next trial, was 10 sec. During the ITI, the recording played continuously. If the S depressed the panel within the 3-sec ISI, the light was terminated and the recorded material played continuously. A response within the 10-sec omission interval following light offset immediately reinstated the recorded material.

PROCEDURE

Each S was tested individually in a normally illuminated room. After the S had been seated in front of the response box, the following instructions were given to the avoidance group: "You will be listening to Bill Cosby recordings. From time to time, the sound will go off. However, this need not happen and you will be able, if you want, to enjoy the recordings without interruptions. This is all that I can tell you." The escape-group instructions were the same as those given to the avoidance group, except that the third sentence was modified to read: "However, this need not happen and you will be able, if you want, to enjoy the recordings with a minimum of interruption."

Following these instructions, the E placed the earphones on the S and allowed

him to make adjustments so that they would fit comfortably. The E then went into a booth and started the tape recorder. A one-way mirror in the booth allowed the E to observe the S. The S was given 20 sec to listen to the recording before the first trial was presented. Sixty trials were administered in a single session. At the end of the session, the S was asked to rate on a 5-point scale the degree to which he disliked or liked the selected recordings.

RESULTS

An escape response was defined as a panel depression occurring within the 10-sec interval between recording offset and light onset. An avoidance response was defined as a panel depression occurring during the 3.0-sec ISI. For both the escape and avoidance groups, the dependent measures were trials to criterion and number of responses. The 60 acquisition trials were divided into 10 blocks of six trials each.

Escape Analyses

The mean number of trials required to reach a criterion of 10 consecutive escape responses was 28.92 and 25.77 for male and female Ss, respectively. This difference was not significant ($t = 0.53$, $df = 24$, $p > .05$).

A two-factor, repeated measures analysis of variance (Winer, 1962) performed on the number of escape responses indicated that the trial blocks main effect was significant ($F = 6.01$, $df = 9/216$, $p < .01$). Table 1 indicates that the greatest performance increment occurred over the first four trial blocks. The main effect for sex and for the Sex by Trial Blocks interaction was not significant ($p > .05$). Of the 26 Ss in the escape group, 3 Ss responded on the majority of the 60 trials to both recording offset and light onset. The remaining 20 Ss responded to both recording offset and light onset on only 35 out of a possible 1,200 trials. No responses were made solely to light onset. That is, responses to the light occurred either in conjunction with responses to recording offset or not at all.

Avoidance Analyses

The mean number of trials to reach a criterion of 10 consecutive avoidance responses was 26.15 and 21.77 for male and female Ss, respectively. This difference was not significant ($t = 0.97$, $df = 24$, $p > .05$).

A two-factor, repeated-measures analysis of variance performed on the number of avoidance responses indicated that the trial blocks main effect was significant ($F = 17.65$, $df = 9/216$, $p < .01$). Table 1 shows that the greatest performance increment occurred over the first four trial blocks. The main effect for sex and for the Sex by Trial Blocks interaction were not significant ($p > .05$). Of the 26 Ss in the avoidance group, 3 Ss failed to make any responses during the session.

The responses on the 5-point scale indicated that 50 of the 52 Ss liked the recorded material.

DISCUSSION

The present study demonstrates that escape and avoidance conditioning can be established and maintained in adult Ss when omission of entertaining material is used as the aversive event in a discrete-trial instrumental conditioning procedure. Three Ss in both the avoidance and escape groups failed to make any responses during the experimental session. This may be attributed to the instructions, which did not state explicitly what response was required. Alternatively, it is possible that the omission of the recorded material was not aversive. However, each of these six Ss rated the recording as being enjoyable.

In addition, three Ss in the escape group responded consistently to the onset of the light as well as to the offset of the recording, even though the former response in no way affected the omission or reinstatement of the recording. The light was presented to the Ss in the escape group as a control to provide evidence that Ss in the avoidance group were not responding to terminate the light, but rather to prevent the omission of the recording. The possibility that Ss were responding only to terminate the light does not appear to be tenable since 20 of the 23 Ss who

responded in the escape group responded primarily to the omission of the recording, and none of the Ss responded only to light onset.

The present procedure offers a methodological alternative to the more common procedure in which the onset of a noxious stimulus (e.g., shock) functions as the aversive event. It is highly unlikely that Ss would experience any physical harm or psychological distress when the aversive event consists of the omission of entertaining material. In addition, this technique should prove to be effective in the study of escape and avoidance conditioning in young children, the mentally retarded, and the aged.

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NOTES

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Table 1
Mean Number of Responses for the Escape and Avoidance Groups Across Trial Blocks

Trial Blocks	1	2	3	4	5	6	7	8	9	10
Escape	2.9	3.7	4.1	4.3	4.3	4.5	4.5	4.6	4.4	4.6
Avoidance	2.3	3.7	4.3	5.1	4.9	5.0	5.1	5.2	5.0	5.2