

# Aversive stimulation and the laughter response

DONALD C. MAIN and RALPH J. SCHILLACE, Oakland University, Rochester, Mich. 48063

*An experiment was performed to demonstrate the efficacy of controlling the laugh response in humans by aversive audiostimulation and to study the immediate aftereffects of suppression of laughter on the laugh response. The findings suggest that audiostimulation occurring after material usually eliciting laughter and in the place of the laughter response, tended to decrease the frequency of occurrence of the response and removal of the aversive stimulation tended to be followed by an accelerated frequency of laughing.*

Few experimental-laboratory investigations of the laugh response in humans have been reported (Hom, 1966; Young & Frye, 1966) despite the apparent importance of this frequent behavior. This dearth of experiments seems to be, in part, a result of the extent to which the nonspontaneous, systematic manipulation of the laughter response results in a distortion of the behavior. The present experiment was conducted to attempt (1) to develop a procedure for producing, suppressing, and recording the laugh response, and (2) to study the immediate aftereffects of suppression of laughter by aversive stimulation on the laugh response.

## Subjects

The Ss were 30 volunteers (males and females, 15 to 65 years old), most of whom were undergraduate students at Oakland University.

## Apparatus

The stimuli used to evoke the laugh response were 12 audio-skits from two Bill Cosby records. The 12 skits used were the highest-rated among 20 skits rated by four independent judges for number of laugh-evoking jokes per sec. The skits were placed on audio-magnetic tapes in a random order. Three tapes were prepared and each consisted of three segments 5 to 10 min long. Each segment contained three to five skits. Aversive stimulation occurred in various segments on the tapes following dialogue which resulted in overt laugh responses. A comparison of the rate of laugh responses with and without the aversive stimulation for each segment constituted experimental and control conditions, respectively. All stimuli were delivered to the Ss individually through earphones. The aversive stimulus was a 30-dB sound of 1 sec duration from an electrical buzzer.

## Procedure

The Ss were randomly assigned to one of three equal and independent groups. The groups were: (1) Experimental group (E) which received the aversive stimuli only in Segment II. Before and after this condition, rates of the laugh response were recorded under standard presentation conditions. (2) Control Group 1 (C1) which received no aversive stimulation in any segment. (3) Control Group 2 (C2) which received aversive stimulation in both Segments II and III.

The laugh response was operationally defined as any sudden expulsion of air associated with pleasant affect revealed by a smile or appropriate verbalizations. The onset through termination of such behavior constituted a single laugh response, regardless of the duration of the behavior.

The tapes were coded for the E for each set of three Ss, to control for E bias. The E observed the behavior of the S while the latter listened to the tapes and the E recorded the laugh response and the time at which it occurred on the tape. Frequency of laugh response per tape per segment was, therefore, obtained. Although the E and S could see each other during the experiment, E was partially shielded so that his recording would not disturb S.

The S was told that he was going to listen to some tapes of skits by Bill Cosby and that he would not be questioned afterward. He was also told that once the tape began he would not be allowed to ask any questions until its end. He was not told about the aversive stimuli on the tape.

## Results and Discussion

The number of laugh responses per S per segment was tallied and converted to rate scores by dividing frequency of responses by the time in seconds per segment. These rates were multiplied by 100 to produce more convenient rate scores which were then averaged per segment for each group. All statistical analyses were done on these scores.

The mean rates per group per segment ranged from 5.40 (Group E, Segment I) to 2.30 (Group C2, Segment III), and their standard deviations ranged from 2.30 (Group E, Segment III) to 1.15 (Group E, Segment II). These means are illustrated graphically in Fig. 1.

A simple analysis of variance among the means for all groups on Segment I revealed no significant differences, suggesting that the base rates of the laugh response for the three groups were essentially equal ( $F = 0.83$ ;  $df = 2,27$ ).

Figure 1 suggests that aversive stimulation during Segment II for Groups E and C2 tended to depress the rate of laughter when compared to the rate for C1 on Segment II. The mean depressive effect is statistically significant between E and C1 ( $t = 3.35$ ,  $p < .01$ ,  $df = 18$ ) and between C2 and C1 ( $t = 3.24$ ,  $p < .01$ ,  $df = 18$ ).

Removal of aversive stimulation on Segment III resulted in a rate of laughter essentially equivalent to the control rate where no aversive stimulation was experienced. This is suggested by the absence of a statistically significant mean difference between E and C1 on Segment III ( $t = 1.60$ ,  $p > .05$ ,  $df = 18$ ). Continued aversive stimulation in Segment III (C2) did not depress the mean rate of laughter significantly below the control condition (C1, Segment III) where no aversive stimulation was presented ( $t = 1.74$ ;  $p > .05$ ,  $df = 18$ ).

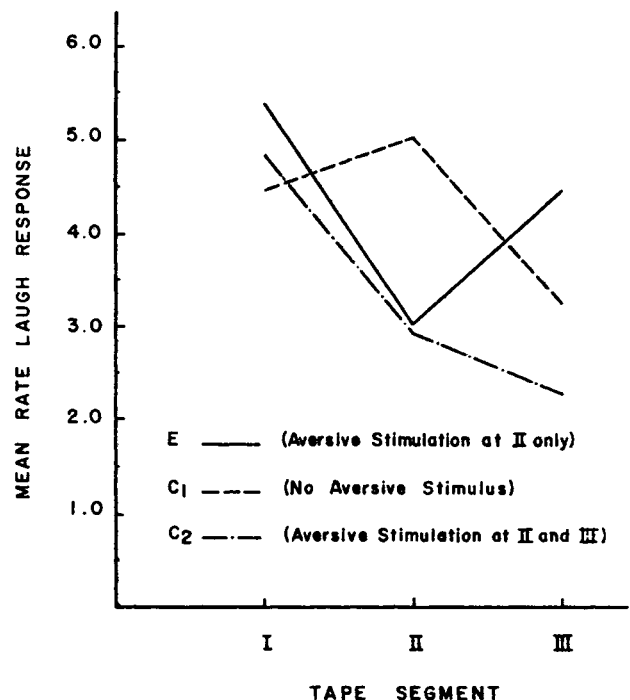


Fig. 1. Mean laugh rates as a function of group and tape segment.

Segment III, without aversive stimulation, tended to elicit less laugh responses than Segments I and II. This drop in responding may have masked the depressive effect of the aversive stimuli in Segment III and the extent to which accelerated responding followed in Segment III after aversive stimulation in Segment II. These suggestions seem reasonable since a statistically significant mean difference was found between Groups E and C2 on Segment III ( $t = 2.92$ ;  $p < .01$ ,  $df = 18$ ). An examination of Fig. 1 suggests that, while both a depressive (C2) and accelerated (E) effect occurred, the latter was more pronounced.

These results clearly support the notion that the laugh response can be systematically manipulated in laboratory investigations. Aversive stimulation following material associated with laughter tended to depress the laugh response. Removal of the aversive stimulation tended to result in a return to a normal mean rate of responding while continued aversive stimulation only mildly depressed the response. There

was also a moderate suggestion that removal of aversive stimulation tended to be followed by an accelerated rate of laughter, suggesting an inhibition-release mechanism.

This latter suggestion would appear to be the most important finding, but it will have to be more reliably established in future experiments. Under the present conditions, the instructions to Ss were such that it is possible to imagine some apprehensive anticipation of future aversive stimulation, following such stimulation on Segment II, therefore causing the laugh response and its full release on Segment III to be somewhat dampened. Future investigations will correct this factor.

#### REFERENCES

- HOM, G. Threat of shock and anxiety in the perception of humor. *Perceptual & Motor Skills*, 1966, 23, 525-538.
- YOUNG, R. D., & FRYE, M. Some are laughing; some are not—why? *Psychological Reports*, 1966, 18, 747-754.