The effect of social reinforcement on the performance of 1-year-old children*

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The effect of social reinforcement on the rate of occurrence of a panel-pushing response was investigated with 34 1-year-old children. Panel pushing was recorded in a 2-min basal period, a 4-min conditioning period, and a 2-min extinction period. During conditioning, social approval was contingent on panel pushing for half the Ss; for the other half, it was not. Of Ss with a low basal rate, those who received contingent social approval showed a greater increase in panel pushing during conditioning and a higher level of performance in extinction than did those who received noncontingent approval. Social reinforcement had no appreciable effect on the performance of Ss with a high basal rate, most of whom were boys. When basal rate alone was considered for all Ss, boys were found to be more active panel pushers than girls.

The present research was designed to investigate whether social reinforcement in the form of approval was effective with children 1 year of age. Various investigators have demonstrated that the social behavior of an adult can act as a reinforcer for young infants and older children (Horowitz, 1967). At present, however, there is very little information regarding the effectiveness of social behavior as a reinforcer for children around the age of 1 year. This age is of particular interest because it is a time when children are becoming increasingly mobile and parents are becoming increasingly concerned with controlling their behavior. Since approval and disapproval are among the major forms of control attempted by parents, the present research was concerned with whether or not social approval functions as a reinforcer for children of this age. Specifically, the present study was designed to investigate the effect of social approval on the rate of occurrence of a simple panel-pushing response such as that used by Lipsitt (1963). For one group of 1-year-olds, social approval was contingent on panel pushing, while for another it was not. As it was possible that at this age the children might be fearful of strangers, e.g., the E, a measure of fear of strangers was also taken.

SUBJECTS

The Ss were 34 children, 21 boys and 13 girls, with a mean age of 11.8 months and a range of 11.0-12.7 months. Ss were assigned randomly to the contingent and noncontingent conditions, such that there were 17 in each, 13 boys and 4 girls in the contingent and 8 boys and 9 girls in the noncontingent condition.

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APPARATUS

A wooden response unit painted flat black with a sloping section, 18 x 12 in., was located on a table facing S who sat in a standard high chair with the tray removed. In the middle of the sloping section was an 8 x 9 in. response panel. A circular area, 3 in. in diam, was cut out of the center of this panel and was replaced by a translucent screen, behind which were two pairs of small flickering bulbs. Both pairs were controlled by a Lafayette flicker fusion apparatus with one pair flickering independently of the other. Thus, the child faced a response panel, the center of which contained a pattern of light which was constantly changing. This served to direct S's attention and hands toward the response panel, although the lights did not vary in any way with S's panel-pushing behavior.

Depression of the response panel by .5 in. closed a microswitch and activated a small light and a standard Gerbrands cumulative recorder. The light, which signaled to E that a response had occurred, could not be seen by S, as it was mounted on a panel at the back of the response unit. Each administration of social approval was also recorded on the cumulative record by means of a hand switch operated by E. The cumulative recorder was located in an adjacent room in order to minimize any auditory cues that it might provide.

PROCEDURE

The testing procedure was conducted by a female E in a small testing room, 9 x 9.5 ft. When the child and his mother entered the testing room, they were seated by E in one corner, and the procedure for assessing fear of strangers, as described by Schaffer & Emerson (1964), was immediately initiated. Following this,

E played with S a few minutes in order to establish a friendly relation with S. Then S was placed in the high chair facing the table and response panel, with his back to his mother. A seat belt prevented S from falling out of the chair. The E sat behind the response panel facing S. The mother was given a letter to read which described the research and was asked to sit quietly during the testing, which began immediately.

Testing was divided into a 2-min basal period, a 4-min conditioning period, and a 2-min extinction period, all of which were timed by E with a stopwatch. During the basal period, all panel-pushing behavior was recorded, but no social approval was administered. Throughout this time, E sat with her head slightly averted, looking at her record sheets. During the conditioning period, the social approval administered by E consisted of smiling and saying, "Good," or, "Good boy (girl)." For Ss in the contingent condition, this was administered each time S pushed the panel. For Ss in the noncontingent condition, this was administered at times when S was not pushing the panel. Each S in the noncontingent condition was matched with an S in the contingent condition with respect to the number of times that social approval was administered. Each pair was also roughly matched with respect to basal response rate. At the end of the conditioning period, the extinction period was initiated without comment from E. During this time, no social approval was administered, and E sat quietly, as in the basal period.

Subsequent to testing, E interviewed the mother regarding S's attachment behavior. These data, however, are not reported here.

The data abstracted from the cumulative records were analyzed in terms of the number of panel-pushing responses occurring in each ½ min of the basal, conditioning, and extinction periods. Separate analyses of variance involving one independent factor, contingency, and one repeated factor, ½-min intervals, were performed for each of these periods. Since rate of panel pushing during the basal period varied greatly, the results for Ss with low response rates were analyzed separately from those with high response rates. A group of 20 Ss emitting 16 or fewer responses during the basal period was defined as the low basal group, and a group of 14 emitting between 21 and 182 responses was defined as the high basal group. In each of these groups, Ss were evenly divided between the contingent and noncontingent conditions, with Ss in the two conditions matched according to the number of times that social approval was administered.

Fig. 1. Effect of contingent and noncontingent social approval on the panel-pushing responses of Ss in the low basal group.

RESULTS

Low Basal Group

The group that received contingent social approval showed a greater increase in panel pushing during conditioning and a higher level of performance during extinction than did the group that received noncontingent social approval. The mean number of responses per S for each consecutive ½-min interval during the basal, conditioning, and extinction periods is presented in Fig. 1 for the 10 Ss, 6 boys and 4 girls, in the contingent condition and for the 10 Ss, 4 boys and 6 girls, in the noncontingent condition in the low basal group.

During the basal period, there were no significant differences between the contingent and noncontingent groups, nor were there any significant changes over this period. The mean total number of responses emitted by Ss from both groups was 5.0.

During the conditioning period, however, the group receiving contingent social approval showed a significantly greater increase in panel pushing over the eight ½-min intervals than did the group receiving noncontingent social approval, as indicated by a significant Contingency by Intervals interaction ($F = 3.06$, $df = 7/126$, $p < .01$). The overall contingency effect was also significant ($F = 7.12$, $df = 1/18$, $p < .025$), but the overall effect of intervals was not.

During extinction, the group receiving contingent social approval

also showed significantly more panel-pushing behavior, as indicated by a significant main effect of contingency ($F = 7.93$, $df = 1/18$, $p < .025$). Though there appeared to be some decrement in response during extinction, none of the other effects was significant.

High Basal Group

The group receiving contingent social approval ($N = 7$) did not differ from that receiving noncontingent social approval ($N = 7$) during any of the three periods, although both groups showed an increase in panel pushing during the basal period and a decrease during the conditioning period. During the basal period, when no social approval was administered, both groups showed a significant increase in panel pushing, as indicated by a significant effect of intervals ($F = 4.71$, $df = 3/36$, $p < .01$). The mean total number of responses made by Ss from both groups during the basal period was 66.1. During the conditioning period, both groups showed a significant decrease in panel pushing, as indicated again by a significant main effect of intervals ($F = 3.25$, $df = 7/84$, $p < .01$). None of the effects involving contingency, however, was significant. There were no significant effects during extinction. Inspection of the data indicates that by the end of the extinction period, the response rate of these Ss had returned to a level comparable to that recorded at the onset of the basal period.

The fact that 11/14 Ss in the high basal group were boys suggested a sex difference in basal rate of panel pushing. This was confirmed by a median test of the total number of responses made during the basal period by all 34 Ss ($\chi^2 = 5.9$, $df = 1$, $p < .025$). Fourteen of the 21 boys were above the median, which was 9.5, while only 3 of the 13 girls were. The range in total number of responses during the basal period was 0-182 for the boys (only one S obtained a score of zero) and 1-51 for the girls.

Fear of Strangers

The results of median tests indicated that there were no significant differences between contingency conditions in either the low or high basal groups, or between the two basal groups overall, with respect to fear of strangers. In fact, the children in this study showed very little fear. Although the scores ranged from 0 to 6 (the highest possible score), the majority of Ss (58.8%) received a score of 0, with only four Ss receiving a score greater than 2.

DISCUSSION

The finding that panel pushing increased significantly more under contingent than under noncontingent social approval for Ss in the low basal group suggests that social approval does function as a reinforcer for children 1 year of age. Although it is possible that the reinforcing function of this behavior may derive from its nonsocial as well as its social aspects, this finding is in line with those for both older and younger children, indicating that the social behavior of an adult can act as a reinforcer (Horowitz, 1967). Since social reinforcement was administered by a strange adult, these results further suggest that by 1 year of age children are already responsive to social approval from persons who are not well known to them, at least as long as their mothers are present. Since fear of strangers did not vary significantly between contingency conditions or basal groups, it is highly unlikely that these findings are attributable to differences in fear of the E.

That social approval had little appreciable effect on the behavior of Ss with a high basal rate of panel pushing may have been due in part to the possibility that their spontaneous emission rate was too high for such reinforcement to be effective. Their response level at the end of the basal period was extremely high, much higher than that attained at the end of conditioning by the Ss in the low basal group. The mean number of responses emitted in the last ½ min of the basal period by all Ss in the high basal group was 19.9, while the mean number emitted in the last ½ min of

conditioning by Ss in the contingent condition of the low basal group was only 8.0. Thus, the high basal rate of these Ss may have precluded the possibility of demonstrating conditioning, at least when using a reinforcer such as social approval.

The significant sex difference reported with respect to panel pushing during the basal period suggests that 1-year-old boys are more vigorous in such behavior than are girls of the same age. This is in line with other findings, suggesting that boys are more active and curious than are girls (Maccoby, 1966; Goldberg & Lewis, 1969). The rise and fall in this behavior during the 6 min of testing suggests a strong exploratory interest in the movement of the panel, which was pursued by pounding the panel ever more rapidly at first, but which

soon gave way to fatigue and loss of interest.

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learned during a psychological experiment (Miller, Galanter, & Pribram, 1960, p. 68). Miller et al seem to agree with Freud (1952), who argues that forgetting of intentions has an "active" quality to it that is not involved in the kinds of forgetting Ebbinghaus studied. Specifically, Freud claims that when we forget to carry out an action which we have decided to do as a favor for others, we must feel antagonistic toward the duty; otherwise, we would not have forgotten (1952, p. 81).

It is possible that memory for all kinds of material has an "active" quality, in which case there is no reason, at this point, to single out memory for intentions as a special case. Rather, until solid evidence is presented to the contrary, it seems likely that the same mechanisms responsible for the forgetting of names, faces, nonsense syllables, and other material are also responsible for the forgetting of intentions.

One variable known to facilitate recall of words in a laboratory situation is the presence of a retrieval cue (e.g., Tulving & Pearlstone, 1966). Since many kinds of cues are effective in getting a S to recall desired items, it seems likely that retrieval cues would also be effective in getting a person to recall an intention. For example, does the husband think about going to the party all day, to the exclusion of other activities? If this be the case and if there are enough parties, he will lose his job. A "mental note" in the morning that he must get ready for the party at 5 p.m. would alleviate him of that burden. The clock in his office showing 5 p.m. would serve as a reminder and facilitate recall of his intention. Freud (1952, p. 79) said this much more elegantly: an "intention slumbers in the person concerned until the time for its execution approaches." It is expected that providing a person with a retrieval cue will "awaken" the intention and facilitate its recall.

A second variable known to affect traditional laboratory recall is the number of items intervening between learning and recall (e.g., Atkinson & Shiffrin, 1968; Loftus & Wickens, 1970). It seems likely that this variable would also affect memory for intentions. For example, if a wife asks her husband at 4:00 p.m. on Friday to be home early for a party that evening, it is more likely that he will remember to be home than if she asks him on the previous Tuesday. In the latter case, many more activities occur that potentially could interfere with his recall.

The present experiment examines the effect of these two variables, presence of a retrieval cue and number

Memory for intentions: The effect of presence of a cue and interpolated activity

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Memory for intentions was investigated by asking S, at the beginning of the experiment, to remember to report, at the end of the experiment, the state in which he was born. Providing S with a retrieval cue at the time he formed the intention facilitated S's recall of the intention. In addition, recall was more probable when fewer items intervened between the forming of the intention and the time at which it was supposed to be recalled. These results suggest that retention of intentions is not different from retention of other kinds of materials with respect to the influence of the two variables tested: presence of a cue and length of the retention interval.

A woman tells her husband that there is a party that night at 7:00 p.m. and asks that he be home early. He makes a "mental note" to leave his office at 5:00 p.m. to allow ample time. The husband intends to carry out a certain act. Intention may be

defined as a determination to act in a certain way or to do a certain thing.¹

It has been suggested that forgetting an intention is not the same as forgetting a telephone number or forgetting a series of nonsense syllables