

Feature-positive effect in children*

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Acquisition of a simple discrimination was retarded in both nursery school children and university students when the feature distinguishing S+ and S- was part of the S- display. These findings are substantially in accord with similarly designed studies with pigeons.

Jenkins & Sainsbury (1969, 1970) and Sainsbury & Jenkins (1967) have reported interesting failures to produce go/no-go visual discriminations in pigeons. When S+ and S- were identical except for one distinguishing feature in S-, the Ss failed to extinguish responding to S-. The discrimination was readily acquired, however, when the distinctive feature was part of S+. Jenkins and Sainsbury called this asymmetry in learning a feature-positive effect.

The present investigation was conducted to determine whether the feature-positive effect is unique to pigeons or occurs in other species as well. The Ss for the present experiments were nursery school children and university students.

EXPERIMENT 1 (CHILDREN)

Subjects

Sixteen children (10 boys, 6 girls) from Knox Day Nursery in Winnipeg served as Ss. The average age was 50 months, with 36 months the youngest and 67 months the oldest.

The children were divided into two groups, with an equal number of boys and girls in each. The average age of the children in Group FP (feature on positive trials) was 54 months; the average age for Group FN (feature on negative trials) was 50 months.

Apparatus

The manipulandum, a 3 x 5 in. (7.7 x 12.7 cm) rear-screen projection key, was mounted on a LVE Human Intelligence console. A Kodak random-access Carousel projector was mounted behind the intelligence panel

and transilluminated the projection key with the stimuli. The stimuli consisted of a 2.6-in. (6.6-cm) -diam black circle on a white surround. The distinguishing feature was a .25-in. (0.6-cm) white circle which could appear in the center of any of the four quadrants of the black circle, or in the center of the circle. Reinforcers (colored plastic tokens) were dispensed by a LVE token dispenser mounted to the left and below the manipulandum. Stimulus presentations, reinforcements, and other control functions were automatically programmed with LVE solid-state modules. Responses were recorded on digital impulse counters.

Procedure

Each S was brought from the playroom to the room containing the apparatus, seated in front of the console, and given the following instructions: "We are going to show you some pictures, right here (point to rear-screen projection key). Sometimes when you push this (hold hand to projection key) while pictures are here you will win some play money. After a while you can buy a chocolate bar with your money. Now remember only push this (point to key) when the good pictures—the ones that give you money—are shown." Following these instructions, the first stimulus was presented, the child's hand was placed on the key, and the correct number of responses (FR 3) emitted with the help of E. Thereafter, the only assistance offered by E was an occasional verbal instruction (e.g., "Remember you must push more than one," or, "Only push when the good pictures are there"). Positive trials (S+) for children in Group FP consisted of the white dot on the black circle. The negative stimulus (S-) for these children was the black circle without the distinguishing dot. For Group FN,

these contingencies were reversed, with the black circle as S+ and the black circle with the white dot as S-. In all cases when the dot was present it could appear randomly ($p = 0.2$) in one of the five positions. S+ and S- trials were randomized ($p = 0.5$) and separated by a 5-sec no-stimulus period (ITI). Each trial lasted a maximum of 7.5 sec or terminated with the completion of three keypresses (FR 3). Completion of the FR 3 in the presence of S+ produced the delivery of a colored plastic token. ITI responses had no programmed consequences.

The experiment was terminated when S had correctly completed 20 consecutive correct trials (i.e., with S+ trials reinforced and S- trials lasting full duration) or after the completion of 100 total trials, whichever came first. At the completion of the experiment, each child was allowed to exchange his tokens for a chocolate bar.

Results and Discussion

Figure 1 represents the average cumulative responses for each of the two groups. The number of positive responses was significantly greater than the number of negative responses in the FP group ($t = 5.91$; $p < .001$) and in the FN group ($t = 3.75$; $p < .01$). In addition, the number of negative responses in the FN group was significantly greater ($t = 3.76$; $p < .01$) than in the FP group. The number of positive responses did not differ between groups ($t = 0.00$), however.

In Group FP, 66% of the Ss acquired the discrimination to criterion compared to 55% in the FN group. Of the Ss in the FN group who acquired the discrimination, 33% acquired it in the final 10 trials. In Group FP, Ss who did acquire the discrimination were observed to track the dot, whereas those who failed to acquire the discrimination did not. The FN Ss were not observed to track the dot systematically, nor was there apparent avoidance of the dot. One of the Ss in the FP group who did not acquire the discrimination failed to respond on 40% of all trials, thus reducing the magnitude of the differences between the two groups.

Both conditions appeared to be more difficult to acquire for the younger children. The S in the FN group who acquired the discrimination most rapidly was the oldest child.

These data indicate that the acquisition of the discrimination was retarded when the distinctive feature was part of the negative stimulus. However, acquisition was not completely blocked, as it was with Jenkins & Sainsbury's pigeons (1969, 1970).

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CHILDREN

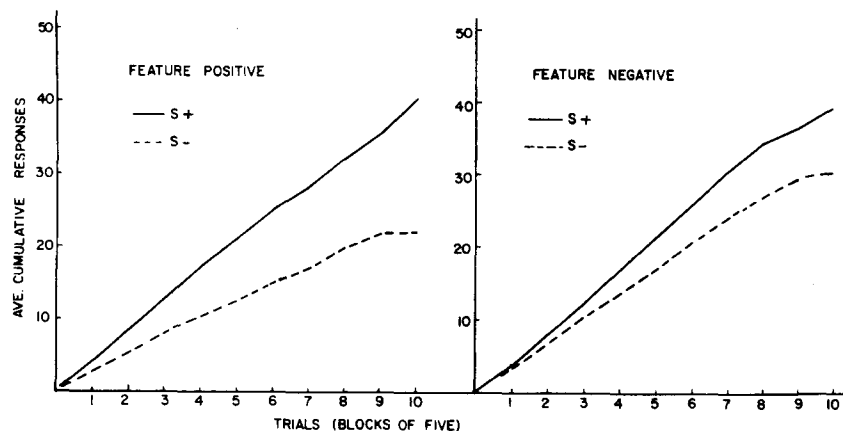


Fig. 1

EXPERIMENT 2 (ADULTS)

Subjects

Six female and four male adults from an introductory psychology course volunteered as Ss. The Ss were divided into two groups of three females and two males each.

Apparatus and Procedure

The apparatus was the same as that reported in Experiment 1. The procedure differed from Experiment 1 in two ways. The instructions were as follows: "This is a learning problem. We are going to show you some pictures right here (point to projection screen). Your task is to press the screen when the positive pictures are shown. If you are correct a token will drop into this cup. Do you understand?" If the S pressed the projection screen only one time, he was told that more than one response was required.

In addition to modifying the instructions, the number of consecutively correct trials to criterion was reduced from 20 to 15.

Results and Discussion

Figure 2 represents the acquisition rates for the two groups. The number of responses to the S+ was significantly higher than to the S-, for both the FP group ($t = 8.51$; $p < .001$) and the FN group ($t = 4.90$; $p < .001$). The number of responses to the S+ did not differ significantly between treatment groups ($t = 0.78$; $p > .05$). However, the number of nonreinforced responses in the FN group significantly exceeded the number in the FP group ($t = 3.62$; $p < .001$). These results again demonstrate that acquisition was retarded when the distinctive feature was part of the nonreinforced stimulus. During the early trials and to a lesser extent during later trials, some Ss failed to respond or responded with fewer than the required three responses to S+. If fewer than three responses occurred, they were emitted near the end of the 7.5-sec interval.

GENERAL CONCLUSIONS

The present studies demonstrate

that the acquisition of a discrimination can be retarded in children and adults when the only difference between a pair of stimuli is a single, distinctive feature associated with the S-. These results are in essential agreement with those reported by Sainsbury & Jenkins (1967) and Jenkins & Sainsbury (1969, 1970).

Their FN pigeons rarely extinguished responding during S- and very few ever acquired the discrimination. Thus, the magnitude of the FP effect would appear to decrease along a rough scale from pigeons to children to adults. It should be noted, however, that other research in the authors' laboratory has failed to find any asymmetry in similar experiments with pigeons (Strub, Gfeller, & Norton, 1970), although it is unclear, as yet, why this should be the case.

Considering the simplicity of the discrimination, it is not clear why a feature-positive effect should occur. A compelling hypothesis is that the Ss must learn not to respond (inhibit) their responses to five separate stimuli when the feature is negative and inhibit responding only to one stimulus (the black circle) when the feature is positive. Jenkins (1970) presented evidence which indicated that failure to inhibit responding was not the reason for the failure of pigeons to acquire the discrimination when the feature was negative. Presently, the most parsimonious explanation is that responding persists to the S- because it is composed of elements common to the S+ which are controlling responding (Jenkins & Sainsbury, 1970).

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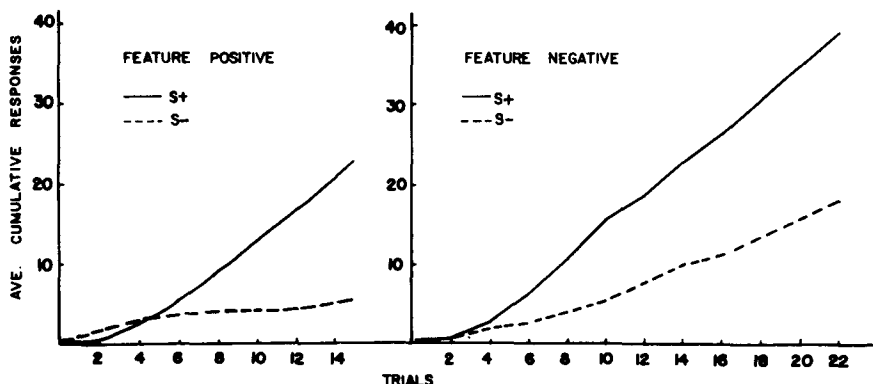


Fig. 2