The effect of early social isolation on imitative pecking in young chicks: The influence of repeated exposure to the testing situation*

DARWIN DORR
Washington University, St. Louis, Mo. 63130

and

JACK G. MAY, JR.†
Florida State University, Tallahassee, Fla. 32306

Ten White Leghorn chicks were reared in social isolation and another 10 were reared normally in a group. When tested at 18 days of age, group chicks exhibited more imitative pecking than did isolates. Isolates' base rates were relatively higher than those of the group animals, and their rate of responding dropped when presented with a model. These effects held up over 6 test days.

Organisms reared in social isolation frequently demonstrate subsequent deficiencies in social responsiveness (Cross & Harlow, 1965; Rheingold, 1956; Turner, Davenport, & Rogers, 1969). In an earlier paper (May & Dorr, 1968), the present authors examined the effects of early social isolation on a social behavior, imitation (more precisely, social facilitation) in young chicks. Chicks were reared for 5 weeks in total social isolation, in visual isolation, and in nonisolation (as a group). When tested on 2 consecutive days, group chicks showed the most social facilitation, visually isolated chicks showed less social facilitation, and isolates' base rates were higher than those of the other two groups, but their response rates dropped significantly when presented with a model.

An interesting question concerns the extent to which the effects found would hold up with repeated exposure to the testing situation. Several results might be expected, including reduction of the social facilitation effect in group animals and a lessening of the apparent "inhibitory effect" in the isolates when presented with the models. Another question concerns the developmental parameters of the effect. Hence, the purpose of the present study was to attempt a systematic replication of the earlier study by using younger Ss and by increasing the number of test sessions to six.

METHOD

Subjects and Apparatus

Ss were 20 White Leghorn chicks hatched in the laboratory in two Oakes Model A6 incubators. The group-rearing chamber consisted of a 34½ x 20½ x 8 in. unpainted pine box. Sawdust covered the floor, and directly overhead was a 20 x 14¼ x 14½ in. aluminum alloy sheet-metal hover. A 25-W G.E. heat lamp was suspended directly over the hover.

The 10 isolation chambers, also constructed of unpainted pine board, were 9¾ x 7¾ x 6 in. Heat was provided by a 15-W bulb that was inserted through a 1½-in. hole in the back of the box. The floor of the box was covered with sawdust. In both conditions, food was scattered on the cage floors and water was provided in small cups.

The test box was an 8 x 10 x 12 in. aquarium divided into equal chambers by an 8 x 10 in. piece of ¼-in. wire mesh. Bottoms of the chambers were covered with sawdust, and grain was scattered on the floor of one chamber. A 2 x 8 in. strip of Plexiglas was placed at the bottom of the dividing screen to prevent sawdust and grain from being thrown from one chamber to the other. Os recorded responses on silent pushbuttons, which operated digital counters and the pens of a Gerbrands event recorder located in another room.

Procedure

Fertilized eggs were incubated until hatching. Shortly before expected hatching date, eggs were separated with cardboard dividers to insure isolation at birth. As chicks hatched, they were placed alternately into the group box or into isolation boxes that were placed in separate rooms throughout the laboratory suite.

Chicks were maintained in their respective rearing conditions for 18 days. At this time testing was begun. Two days were required to test all Ss once, so that 12 calendar days were required to collect 6 days' worth of complete data. In the first (baseline) period, each chick was placed alone in one side of the test chamber for 5 min. Food was *never* present in S's compartment but always present in the model's (M's) compartment. Two Os (the first author and an assistant) recorded Ss' pecking on 9 of the 12 days of testing. On the remaining 3 days, the first author recorded alone. Pecking was defined as striking objects with a quick, sharp stroke of the beak. Pecks that were directed at the floor of the cage were counted.

In the second 5-min period (test period), M was placed in the second compartment. Five Ms, trained to peck continuously at the food in their compartment of the test box, were used and were rotated such that each M served in both experimental conditions. During this period, Ss' responses were recorded. For the third (baseline) period, M was removed and Ss' responses were recorded for another 5 min.

RESULTS AND DISCUSSION

The interrater reliability coefficient (Pearson r) reflecting the two Os' recordings (averaged over days, periods, and minutes) was .78. Data for the 2nd, 4th, and 6th test days are depicted in Fig. 1. Data were statistically analyzed with a four-way analysis of variance (Groups by Days by Periods by Minutes) with repeated measures on the last three variables. The F ratio representing the Groups by Periods interaction was 47.70 ($p \leq .001$, $df = 2,30$), indicating clearly the differential response patterns of the group and isolated animals in their respective test conditions. F ratios representing main effects for days, and for days in

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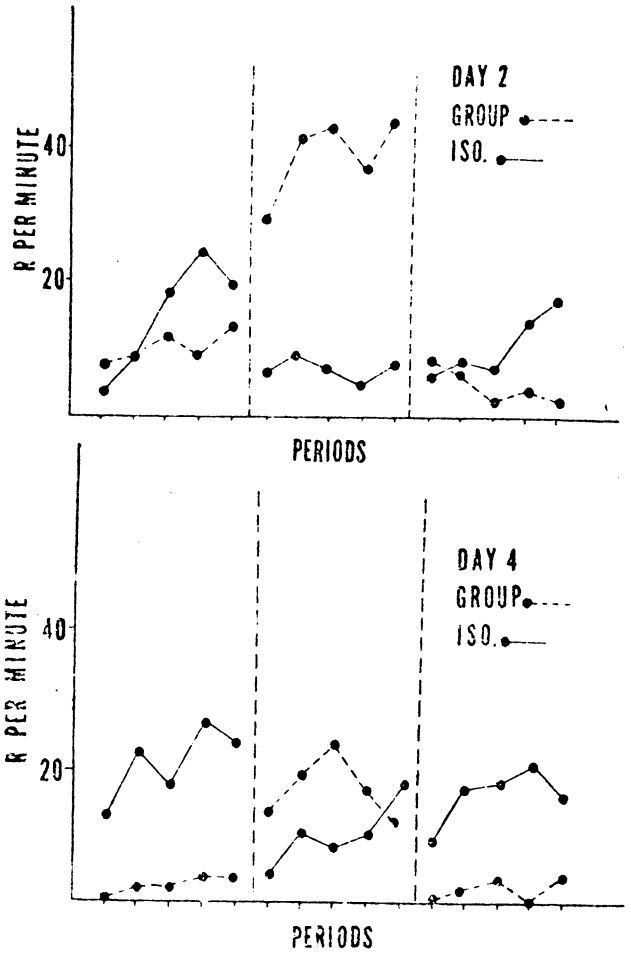

Fig. 1. Response rate per minute by periods on Test Days 2 and 4.

interaction with all other variables, were all nonsignificant.

The results of our first study have clearly been replicated using younger Ss, and the effect is stable over at least six exposures to the testing situation. While circumstances prevented further exposure to the testing situation in the present study, it would be very desirable in future studies to increase the number of testing exposures to 20, 30, or even 50 sessions to exhaust the parametric examination of the effect.

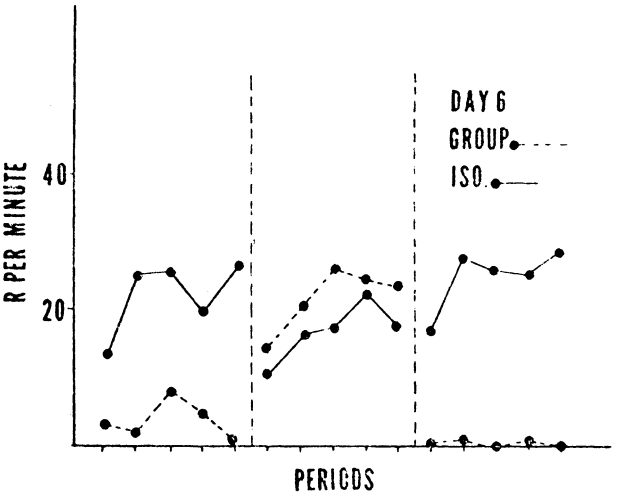

Fig. 1. (Cont.) Response rate per minute by periods on Test Day 6.

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