Social feeding in domestic chicks: Effects of food deprivation of nonfeeding companions[1]

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Five-day-old, 6-h-food-deprived cockeral chicks were tested for amount of feeding behavior when alone or when separated by Plexiglas from 0-h, 6-h, or 24-h food-deprived companions (Cs), who either had food and were free to eat or had no food. The feeding of Ss varied positively with the food deprivation of Cs who could eat but not with that of noneating Cs. It was concluded that although Cs' nonfeeding behavior may have a real facilitative effect upon Ss' feeding, the effects of Cs' food deprivation are mediated specifically by Cs' feeding behavior.

It has been demonstrated that a chick's feeding behavior can be described as a function not only of his own food deprivation, but of the food deprivation of his feeding companion (Tolman & Wilson, 1964; Tolman, 1968b). Presumably the critical factor operating here is the vigor of the companion's (C's) feeding behavior (Tolman, 1968a).

It has also been demonstrated recently that, although the mere presence of the C is inadequate to bring about a facilitative effect upon S's feeding behavior, general activity or behavior other than feeding on the part of C can have such an effect (Tolman, 1968b). Thus the question arises whether the effect of C's level of food deprivation upon S is also mediated by behavior other than feeding. The present experiment was designed to answer this question by testing 6-h food-deprived Ss in the presence of 0-h, 6-h, and 24-h food-deprived Cs who could not eat.

SUBJECTS

Ninety-four white Leghorn cockerels obtained as day-olds from a local commercial hatchery were tested when 5 days of age. Water and food, a locally prepared chick starter mash, were continually available in the brooder except for the periods of food deprivation described below. A 6-W incandescent lamp in the 4 sq ft brooder compartment provided constant illumination. Temperature was maintained at approximately 88 deg F.

APPARATUS

The test apparatus was a rectangular observation box with clear plastic walls, 10 x 18 x 10 in. It was divided into two compartments of equal size by the insertion of a 3/32-in. clear plastic partition into vertical grooves in the side walls. The wood floor was finished in a gray enamel paint. Two 100-W desk lamps were placed between the Os and the test box, illuminating the observation areas from central points 12 in. above the floor of each of the two compartments. The temperature in the observation boxes was the same as that in the brooder, about 88 deg F.

PROCEDURE

All Ss were deprived of food 4 to 6 h prior to testing. Each was assigned to one of the following conditions:

- ISOL: to be tested alone (N = 10).
- S/C0: to be tested with a 0-h deprived C who had access to food (N = 6).
- S/C6: to be tested with a 6-h deprived C who had access to food (N = 10).
- S/C24: to be tested with a 24-h deprived C who had access to food (N = 6).
- S/CN0: to be tested with a 0-h deprived C who had no access to food (N = 10).
- S/CN6: to be tested with a 6-h deprived C who had no access to food (N = 10).
- S/CN24: to be tested with a 24-h deprived C who had no access to food (N = 10).

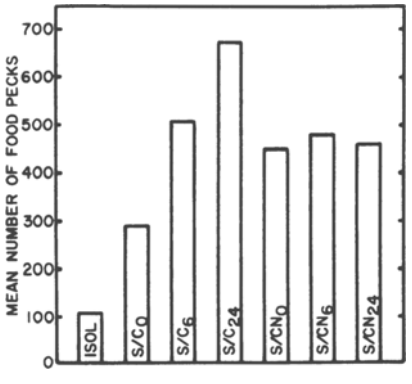

Fig. 1. Mean number of food pecks as a function of experimental condition.

In all conditions except ISOL, C was placed into the observation compartment adjacent to S's, and thus was separated from him by a clear plastic partition.[2] For Ss in all conditions and Cs where appropriate, food was spread evenly over the floor of the observation compartment forming a layer approximately 1/8 in. deep.

Test periods were 7 min in length. The dependent variable was the total number of food-directed pecks emitted by each S during the test period.

RESULTS

The resulting group means are presented in Fig. 1. Analysis of variance showed a significant difference between ISOL and the other groups combined ($F = 40.38$, $df = 1/55$, $p < .01$). The differences among the groups with feeding Cs, S/C0, S/C6, and S/C24, were also significant ($F = 7.93$, $df = 2/55$, $p < .01$). The differences among the groups with nonfeeding Cs, S/CN0, S/CN6, and S/CN24, were not significant ($F < 1.00$). The difference between the three C groups and the three CN groups was also not significant ($F < 1.00$).

DISCUSSION

The significant difference between ISOL and the remaining groups confirms earlier findings (e.g., Tolman, 1968a, b) and shows the facilitative effect of C upon S's feeding behavior. This result, together with the failure to find a difference between the combined C groups and combined CN groups, also confirms an earlier finding that C need not be engaged in feeding behavior in order to have his facilitative effect. The earlier finding indicated that the effect did not occur when C was completely inactive.

Also confirming earlier findings (Tolman & Wilson, 1965), the feeding behavior of S was clearly affected by the food deprivation of C in those groups where C had access to food and thus could engage in feeding activity. Since, in the present results, such an effect did not occur in the groups where C had no access to food, it may be concluded that the facilitative effect upon S of C's food deprivation is mediated by C's feeding behavior.

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NOTES

1. This work was supported by Grant APA 245 from the National Research Council of Canada.

2. For a discussion of this separated testing procedure see Tolman, 1968b.