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DIFFERENTIAL EFFECTS OF A GREAT HORNED OWL DECOY ON THE BEHAVIOR OF JUVENILE AND ADULT GRAY JAYS

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Abstract.—The effects of a Great Horned Owl (*Bubo virginianus*) decoy on the feeding behavior of adult and juvenile Gray Jays (*Perisoreus canadensis*) were tested by comparing the feeding activity of the jays in the presence of the decoy with that in the presence of a Ring-necked Duck mount and in the absence of other species' models. The owl decoy had little effect on the juveniles' feeding activity, but a marked effect on the behavior of their parents. As a consequence of agitated parental behavior, the juveniles became more hesitant in the presence of the owl decoy during testing, while the adults tended to habituate to the decoy.

EFECTO DE LA PRESENCÍA DE UN SEÑUELO DE *BUBO VIRGINIANUS* EN LA CONDUCTA DE ADULTOS Y JUVENILES DE *PERISOREUS CANADENSIS*

Sinopsis.—Se estudió el efecto de un señuelo plástico de buho (*Bubo virginianus*) en el comportamiento alimentario de *Perisoreus canadensis*. Se comparó la conducta alimentaria de aves, en ausencia de modelos, en presencía del señuelo y de un pato disecado (*Aythya collaris*). El buho plástico causó alarma en los adultos, lo que a su vez afectó sus patrones de alimentación; el señuelo no causó efecto en los juveniles de *P. canadensis*. Como consecuencia de la conducta de alarma de los adultos, los juveniles se mostraron más cautelosos ante el señuelo. Los adultos terminarón habituandose a la presencía del modelo de buho.

Vigilance and anti-predator behavior, which vary with age and experience, have marked effects on feeding and foraging activities (e.g., Barnard 1980, Lazarus 1979). In the present investigation, we studied the effects of a life-sized Great Horned Owl (*Bubo virginianus*) decoy on the behavior of a family of Gray Jays (*Perisoreus canadensis*) and compared the behavior and food selections of adults and juveniles in the presence of the owl decoy and in two predator-free situations.

METHODS

Experiments were carried out with a family of unmarked Gray Jays, consisting of two adults and three recently fledged juveniles, beside a small pond in Salmonier, Newfoundland during April and May, 1980. The birds were consistently feeding on three types of food of approximately equal weight: salt pork (fat), Ken-L-Ration dog food (meat) and Saltine crackers (carbohydrate). Each food type was higher in either fat, protein, or carbohydrate, respectively, than either of the other two. Owing to the jays' opportunistic feeding habits and close association with humans (Lawrence 1973), the choice of foods seemed legitimate.

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Satiation was not a factor during the experiment. Gray Jays, like other corvids, hoard food (e.g., James and Verbeek 1983, Tomback 1980), and food items were rarely eaten during tests. The birds made continuous trips to the feeding area and during tests, were not observed to take any food other than those offered. Tests were run in the morning with a single observer positioned approximately 15 m away. Gray Jays often approach humans closely, and previous studies showed that human observers do not inhibit the jays' feeding behavior (Maccarone and Montevecchi 1986).

Before introduction of the decoy or control mount, eight baseline tests were run to assess possible age-class differences in food preference. During each test, 10 food items of each type were randomly spread over a 2 × 2 m area on the ground. Different types of food appeared equally visible (to humans). To partially compensate for changes in the proportions of different foods as items were removed during a test, only the first 50% of the birds' choices were analyzed. This technique has been used in other feeding experiments (e.g., Bantock and Harvey 1974, Horsley et al. 1979, Manly et al. 1972). Depletion times were recorded as the period between the removal of the first and the fifteenth food item. Latency to feed was measured from the time that a jay was within 5 m of the food until the first item was taken. A test ended when all baits had been removed, or 10 min after the first item had been taken.

To examine the effects of a predator on the jays' feeding behavior, a life-sized plastic Great Horned Owl decoy or a mounted female Ring-necked Duck (*Aythya collaris*) was randomly presented near the feeding site during different trials. Both Great Horned Owls and Ring-necked Ducks breed in the area (Maunder and Montevecchi 1982). The decoy and mount were placed approximately 3 m from food items; the owl on a 60 cm tree stump, the duck on grass near the pond. We judged both decoys to be equally visible. Twenty-four trials were carried out, eight in each of the owl, duck, and no decoy or mount conditions. Experimental conditions were randomized across trials to control for habituation effects resulting from repeated testing (Andrews 1961, Conover 1985).

RESULTS AND DISCUSSION

During baseline trials, adults took more fat and meat items than crackers, whereas juveniles took all food types in similar proportions (Table 1). Adults averaged (±SD) 3.8 ± 0.9 food items/individual/test compared to 2.6 ± 0.6 food items/individual/test for juveniles ($t = 3.34$, $df = 14$, $P < 0.01$). Adults averaged (±SD) 1.7 ± 0.6 baits/foraging trip compared to 1.3 ± 0.5 for juveniles ($t = 3.78$, $df = 14$, $P < 0.01$). Throughout the study, adults were similarly selective in their choices of food items, whereas juveniles appeared to land and take items nonselectively. Presence of the decoy or mount did not affect food choices.

When the owl decoy was present, juveniles removed significantly more items/trial on average (5.8) than adults (3.0; $t = 2.88$, $df = 14$, $P < 0.02$). During the duck mount and no decoy tests, both age classes re-

TABLE 1. First 50% food choices of two adult and three juvenile Gray Jays during eight baseline trials. Chi-square values based on expected equal frequencies of removal.

Age class	Food type			Total	χ^2 (H_0: random selection)
	Fat	Meat	Crackers		
Adult	26	27	7	60	12.7[a]
Juvenile	22	19	19	60	0.3
Total	48	46	26	120	

[a] $P < 0.01$.

moved the same number of baits (Table 2). Mean (±SD) latency to feed was 123.1 ± 123.9 s when the owl decoy was present, compared to 17.7 ± 12.7 s when the duck mount was present and 10.6 ± 5.6 s when no decoy or mount was present ($F = 8.45$, df = 2, 33, $P < 0.01$). The owl decoy disrupted the adult jays' feeding responses and caused alarm-calling and avoidance of the feeding area. There were no significant differences in mean latencies to feed between adults and juveniles in any testing conditions. When the owl decoy was present, significant negative correlations were found between trial number and latency to feed ($r = -0.75$, $P < 0.05$) and between trial number and depletion time ($r = -0.92$, $P < 0.01$). No such relationships were evident in either control condition. Once the jays began to feed, tests with the owl decoy progressed more slowly than tests with either the duck mount or no decoy or mount. The mean (±SD) depletion time for tests when the owl was present was 375.0 ± 167.8 s (two trials were terminated after 10 min) compared to 175.6 ± 38.7 s and 141.9 ± 59.7 s for tests when the duck mount and when no decoy or mount was present ($F = 11.84$, df = 2, 21, $P < 0.01$).

The striking, disruptive effects of the owl decoy on the feeding behavior of adult Gray Jays contrasted sharply with the initial lack of effect on the juveniles' behavior. Prior experience most probably played an important role here. The recently fledged juveniles apparently lacked exposure to a Great Horned Owl and exhibited little fear; they were much less wary of the owl decoy than adults. This is best illustrated by comparing the number of food items taken by adult and juvenile birds in the presence and absence of the owl decoy. Only in tests when the owl decoy was present, did the juveniles remove more food items/individual than adults. The juveniles did, however, react to the alarm-calling of adults by taking longer to begin feeding when the owl decoy was present. Feeding latencies of the juveniles tended to increase across tests with the owl, indicating that the young birds were learning from their parents to be wary in the owl decoy's presence. Interestingly, during the same period adults were, in turn, habituating to the owl decoy, as evidence by an attenuation of their alarm-calling and frenetic behavior and decreased feeding latencies over trials. Andrews (1961) and Conover (1985) found similar habituation effects among Eurasian Blackbirds (*Turdus merula*)

TABLE 2. First 50% food item choices of two adult and three juvenile Gray Jays in three experimental conditions. Replicate of eight trials in each condition.

Food type	Owl decoy			Duck mount			No decoy or mount			Total
	Adult	Juv.	Sub total	Adult	Juv.	Sub total	Adult	Juv.	Sub total	
Fat	14	14	28	24	6	30	19	14	33	91
Meat	8	16	24	11	18	29	18	14	32	85
Crackers	2	14	16	5	16	21	4	11	15	52
Total	24	44	68	40	40	80	41	39	80	228

and Common Crows (*Corvus brachyrhynchos*) after repeated exposure to an owl decoy.

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