

Spring 1973

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Recommended Citation

Van Male, M. 1973. Black-capped Chickadee behavior-fledging to dispersal. Field Station Bulletin 6(1): 5-8.

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BLACK-CAPPED CHICKADEE BEHAVIOR-FLEDGING TO DISPERSAL

Most studies of the family life of young birds after they leave the nest have been descriptive and anecdotal with little quantitative behavioral data, despite the many interesting problems involved in interactions of the members of a family. The objectives of this study were to determine: 1) the behavior of parents and young Black-capped Chickadees (*Parus atricapillus*) at the time of leaving the nest, 2) how the parents and young behave towards each other during the period when the young are dependent on their parents, 3) the factors responsible for the final disruption of the family. Since aggression was anticipated to be the primary factor causing dispersal, special attention was focused on the aggressive behavior of parents toward their young and the behavior of the young toward one another.

MATERIALS AND METHODS

The study took place at The University of Wisconsin—Milwaukee Field Station between June 2, 1972 and August 14, 1972. The adult Chickadees that I studied had been color banded by Dr. Charles Weise. Each chickadee was banded with a U.S. Fish and Wildlife Service aluminum band and one or two colored bands. Every adult bird, therefore, had its own color combination which permitted easy recognition of individuals in the field. Forty-four nestlings were banded by John Meyer, a graduate student, using the same color combination for all young in a family. Six families were studied.

To identify banded chickadees a pair of 7 X 35 binoculars was used. On several occasions recordings of chickadee vocalizations were employed to lure chickadees close enough so that proper identifications could be made or to enable observation of behavior at close range.

Observations included data on distance between family members, the number of feedings, amount of begging by young, and number and type of aggressive interactions. As measures of aggressiveness I used Head Ups (a common threat display), chases, Gargles (a vocalization commonly associated with aggression), and lunges. Fights were very rare. These aggressive acts were counted and averaged over a five-minute period. Average distance apart of family members was obtained over a 2 day period.

RESULTS

The Nestling Period: Both parents feed the young although the male feeds them more often than the female in the first days after hatching, when the female is often engaged in brooding the young. The average time the young spend in the nest after hatching is 16 days (Odum, 1941).

Fledging: My observations and those of Odum (1941) indicate that leaving the nest usually takes place in the morning. The onset of fledging appears to be caused by at least two factors: 1) About two to three hours before fledging there is a decline in the frequency of parental feedings of the young. 2) The parents

give a vocalization just prior to the young leaving the nest. This call sounded different from their usual Chick-a-dee-dee call. This call is apparently attractive to the young, inducing them to leave the nest within a few minutes of the onset of calling. Connell (1948) noted that young of the Plain Titmouse (*Parus inornatus*) fledged almost immediately following calls by the parents.

Post-Fledging Behavior:

Days 1-5: Immediately after fledging the young cling tightly to branches in a crouched position. The adults stay near them and apparently try to induce them to move away from the nest tree and into more protected surroundings. Within an hour the family usually moves several hundred feet away and up considerably higher in the canopy where they remain for several days. Once the young are high in a tree the parents resume feeding the young. The young stay close together, rarely more than a few inches apart and move about very little except when they are about to be fed. The male and female may each feed separate groups of young. About the third day, they begin competing for food from the parents by jumping over one another in an attempt to get closer to the parent.

From days three to five the parents forage for food at greater distances than when the young first left the nest. By this time the family has usually moved to a location along the forest edge where a variety of low trees and shrubs protect them while they are foraging.

Day 5-10: As young perfect their flying abilities they become a little more independent. Curiosity serves as an important learning device in the young life of a fledgling and fledglings do a great deal of exploratory pecking.

Very little aggressive behavior was observed among family members in days 1-10 after fledging with the exception of some chasing.

Days 10-20: The young at this point are nearly indistinguishable from the adults. Their tails are no longer stubby and their wing feathers are fully developed. Even the begging calls of the young have changed by the latter part of this period, resembling the Chick-a-dee-dee-dee calls of the adults but having a more nasal quality.

The Head Up display, lunges, fights, chases and a great deal of Gargling usually occur when a rival male (with or without his family) gets too close to another male's family. Three incidents were observed in which a strange juvenile tried to join a family. In each case the stranger was repelled by aggressive displays and chases.

The daily body maintaining activities of the young now include preening, bathing, sunning and resting. What initially was undirected pecking, has by this point become a serious attempt to find their own food. After about 20 days post-fledging the young were often heard making weak attempts at producing song. The song of the fledgling is much like the song of the adult male but it lacks the even pitched quality of the song given by a mature chickadee.

The main activities of the young after their tenth day out of the nest were very different from those performed earlier. More aggressive behavior was observed (see Figure 2). When one young was fed another fledgling often chased and jumped upon the bird that had just been fed. Gargling often accompanied these chases and lunges. In addition to the young becoming more aggressive toward each other, the parents, particularly the male, become more aggressive towards their young, responding to their approaches with lunges, Head Ups, Gargles and chases. It was often observed that the parents would ignore the begging of a young bird that was following them despite the insistent approaches of the young. Shortly after the young begin to feed independently, their begging calls decline as do the number of feedings they receive (Figure 1).

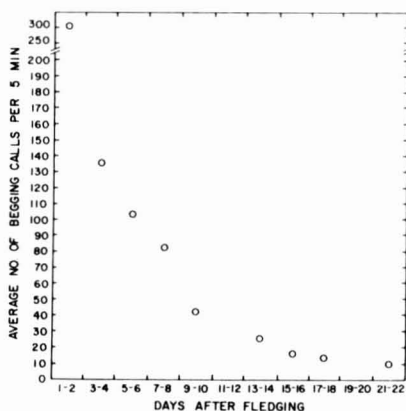


Figure 1. Amount of begging as related to age of young.

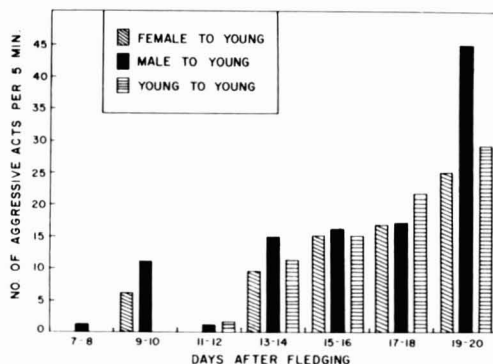


Figure 2. Amount of aggression among family members.

The average distance between young and their siblings and between young and their parents increases from a few feet after fledging to as far apart as 100 feet near the time of dispersal.

Group Formation: After the break-up of the family the young become members of a group which usually consists of at least one adult pair (whose territory the group lives in) and young of a variety of different families (Odum, 1941). The group members forage together in the same general vicinity but not necessarily close together. The adults forage with their mates and the young stay quite close together while foraging off usually at some distance from the adults.

DISCUSSION

There are several important behavioral changes as the young approach the time of independence. Becoming independent and finally dispersing from the family group is a gradual process, which begins a week or so after the young leave the nest. As the young begin to find food on their own they beg less frequently from their parents. At about the same time, the parents become more intolerant of the young, often behaving aggressively toward them, which may be at least partially due to a change in stimulation received from the young, e.g. less begging. Heightened aggression from the parents, particularly the male, may lead to increased spacing of parents and young. The young as they mature become increasingly intolerant of each other, spacing themselves at greater distances from each other. Initially there are attachments among family members, as reflected in the tendency of the family to stay close together. These attachments are soon replaced by intolerance. The final break up of the family group is probably brought about by the increasing aggression of the parents toward the young and of the young toward each other. However, this does not explain why the young move such long distances or why a new group is then formed.

I thank Dr. Millicent Ficken and Dr. Charles Weise for their advice in conducting this study and criticisms of the manuscript. Dr. Weise and John Meyer helped find the nests and banded the birds. This study was supported by a National Science Foundation Undergraduate Research Participation Grant.

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