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A COMPARATIVE STUDY OF GROWTH AND SURVIVAL IN NESTLING MOCKINGBIRDS AND BROWN THRASHERS

BY

BETTE J. SCHARDIEN
B.A., Florida Technological University, 1973

THESIS

Submitted in partial fulfillment of the requirements for the degree of Master of Science: Biological Science in the Graduate Studies Program of the College of Natural Sciences of Florida Technological University at Orlando, Florida

Fall Quarter
1978

Acknowledgment

I thank the members of my advisory committee: Drs. Llewellyn Ehrhart, I. Jack Stout, and Henry Whittier for their assistance and patience. R. Demmer, M. H. Keim, and R. Snyder assisted with field work for which I am very grateful. I owe special thanks to my thesis advisor, Dr. Walter Taylor, both for his guidance throughout my undergraduate and graduate years and for his much needed assistance in editing my thesis. I also thank Dr. Jerome Jackson for making helpful comments on an earlier draft of this thesis and Mrs. Lyda Eubank for her patience and skill in typing the final draft. Finally, I would like to thank my parents, Mr. and Mrs. Russell K. Schardien, who have always been there when I needed them.

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Introduction

Numerous references to the biology of Mockingbirds (Mimus polyglottos) and Brown Thrashers (Toxostoma rufum) are available. Of the two species the Mockingbird has been studied more. Aspects of Mockingbird life history have been studied by Visscher (1928), Laskey (1935, 1936, 1962), Michener and Michener (1935), Michener (1953), and Graber et al. (1970). Erwin's (1935) study of the breeding biology of the Brown Thrasher in Tennessee is the most extensive work on the life history of this species. Other investigators of Brown Thrasher biology include Gabrielson (1912), Johnston (1953), and Graber et al. (1970).

The appearance and weight of neonate Mockingbirds and Brown Thrashers have been presented (Wetherbee 1957, 1958; Wetherbee and Wetherbee 1961; Saunders 1956). Horwich (1965, 1966) studied feather development and the ontogeny of wing-flashing in hand-raised Mockingbirds. Other than these papers, little information on nestling development is available for either the Mockingbird or the Brown Thrasher. I studied growth of nestling Mockingbirds and Brown Thrashers in central Florida and will present an analysis of my observations here. In addition to growth parameters, I will present data on and discuss incubation periods, clutch size, nestling periods, and nesting success.

Methods

Data were collected during the 1974 and 1975 breeding seasons in Orange and Seminole counties, Florida. In 1974 I studied these birds at their nests located in developed and undeveloped portions of the Florida Technological University campus and in surrounding areas, including two orange groves. Most areas, except the two orange groves, were abandoned in the latter portion of the 1974 nesting season when I discovered that nests were easier to find and more numerous in the groves. In 1975 my studies were confined to birds nesting in the orange groves.

In 1974 parts of the larger area were searched for nests almost daily. However, because of the size of the total area, it was not possible for me to cover the area frequently enough or carefully enough to find all nests before young had hatched. As a result, data from 1974 cannot be used to estimate periods of peak breeding. In 1975 I searched the two orange groves systematically and discovered most nests before young had hatched. Data presented here on nestling growth and development are only from nests which I discovered prior to hatching; therefore, all young are of a known age.

I visited nests each day as close to sunset as possible. Nests containing eggs of known laying data were not revisited until the

expected day of hatching approached. Nestlings were weighed to the nearest 0.1 g on an Ohaus triple beam balance. The following linear measurements were taken on each nestling: (1) length of the manus, (2) culmen length from the distal edge of the nostril, (3) width of the gape, and (4) length of primary eight. In taking measurements, I followed the techniques described by Baldwin et al. (1931). All linear measurements were taken with dividers and a metric rule graduated to 1 mm. The measurements were estimated to the nearest 0.5 mm. Nestlings were marked on the tarsometatarsus with waterproof, colored markers to facilitate identification of individuals. All data were collected at the nest site.

Statistical analysis of data included the use of basic parametric statistical tests as described in Sokal and Rohlf (1969). An alpha level of 0.05 was used as the criterion for accepting differences between data samples as being statistically significant.

Results and Discussion

Range

Mockingbirds and Brown Thrashers occur throughout much of North America (AOU Checklist 1957). However, the Brown Thrasher is a relatively recent breeder in central and south Florida. The 1910 AOU Checklist reported it as breeding as far south as Georgia. By 1931 its breeding range had been extended to central Florida (AOU Checklist 1931). Bent (1948) reported Brown Thrashers breeding abundantly in Georgia and casually, if not regularly, as far south as Miami. As a relatively new breeder in central Florida, the Brown Thrasher may not be as well-adapted to the habitat and climate of this area as the long-established Mockingbird.

Seasonality

Mockingbirds along the south Atlantic coast usually begin breeding by late April or early May and frequently raise three broods (Bent 1948). Instances of four broods occur, but it is rare for all to be successful (Laskey 1962). According to Bent (1948) peak egg laying occurs between 24 April and 21 May. I found that 54% of the Mockingbird nests (N = 28) in 1975 contained eggs between 27 April and 21 May.

The peak nesting period for Brown Thrashers reportedly occurs

between 3 and 25 May (Bent 1948). I found, however, that only 11% of the Brown Thrasher nests (N = 38) found in 1975 contained eggs between those dates as compared to 48% containing eggs between 21 May and 15 June. In a Kansas study, Johnston (1958) found that 65% of the Brown Thrasher nests held eggs between 11 May and 10 June. While data from 1974 were not used to estimate peak breeding periods, the data from that year corroborate those obtained from the 1975 season.

Why Brown Thrashers tend to breed later than Mockingbirds is not clear, but it may reduce competition between the two species since they nest in close proximity and use similar food resources. Although I gathered no data on food habits, both species are largely insectivorous, especially in regard to feeding their young. Studies on the food preferences of the two species indicate that they overlap considerably in their food sources and probably compete for available food resources (Gabrielson 1912, Bent 1948, and Martin et al. 1951). Dyrcz (1974) hypothesized that seasonal differences in the weights of nestling Reed and Great Reed Warblers may have resulted partly from competition for food between the two species even though their food items were often different.

Clutch Size

I found little intraspecific variation in clutch size for either species. The 28 Mockingbird clutches found in 1975 averaged 3.1 eggs. Seventeen clutches found in 1974 averaged 3.3 eggs. The mean clutch size for the two years combined was 3.2 eggs. In 1975,

there were 14 clutches of three eggs (50%), 10 clutches of four eggs (36%), and four clutches of two eggs (14%). In 1974, there were nine clutches of three eggs (53%), five clutches of four eggs (29%), two clutches of two eggs (12%), and one clutch of five eggs (6%).

Mean clutch size was smaller in Brown Thrashers than in Mockingbirds, but the difference was not significant ($t = 1.52$, $p < .05$). The 37 clutches found in 1975 averaged 3.1 eggs; 15 clutches from 1974 averaged 2.9 eggs. The average clutch size for both years combined was 3.0 eggs. In 1975, 23 nests contained three eggs (62%), nine contained four eggs (24%), four contained two eggs (11%), and one contained one egg (3%). In 1974, there were 12 clutches of three eggs (80%), two clutches of two eggs (13%), and one clutch of four eggs (7%).

Both species laid smaller clutches than their conspecifics from more northern regions (Figures 1 and 2). Bent (1948) found clutch size in both species to vary from three to six eggs with four or five being the typical number. Mockingbirds in Tennessee had four eggs 63% of the time, three eggs 23% of the time, and in rare instances six eggs (Laskey 1962). Brown Thrashers in Tennessee laid four eggs in 31 clutches (60%), three eggs in 13 clutches (25%), five eggs in seven clutches (13%), and two eggs in one clutch (2%) (Erwin 1935). Brown Thrashers in Kansas had an average clutch size of 3.5 eggs (Johnston 1958). This tendency to produce larger clutches in more northern regions supports the hypothesis that clutch size increases from the tropics outward towards the poles

Figure 1. A comparison of clutch size between Mockingbirds nesting in central Florida and those nesting in Tennessee. (Tennessee data from Laskey, 1962)

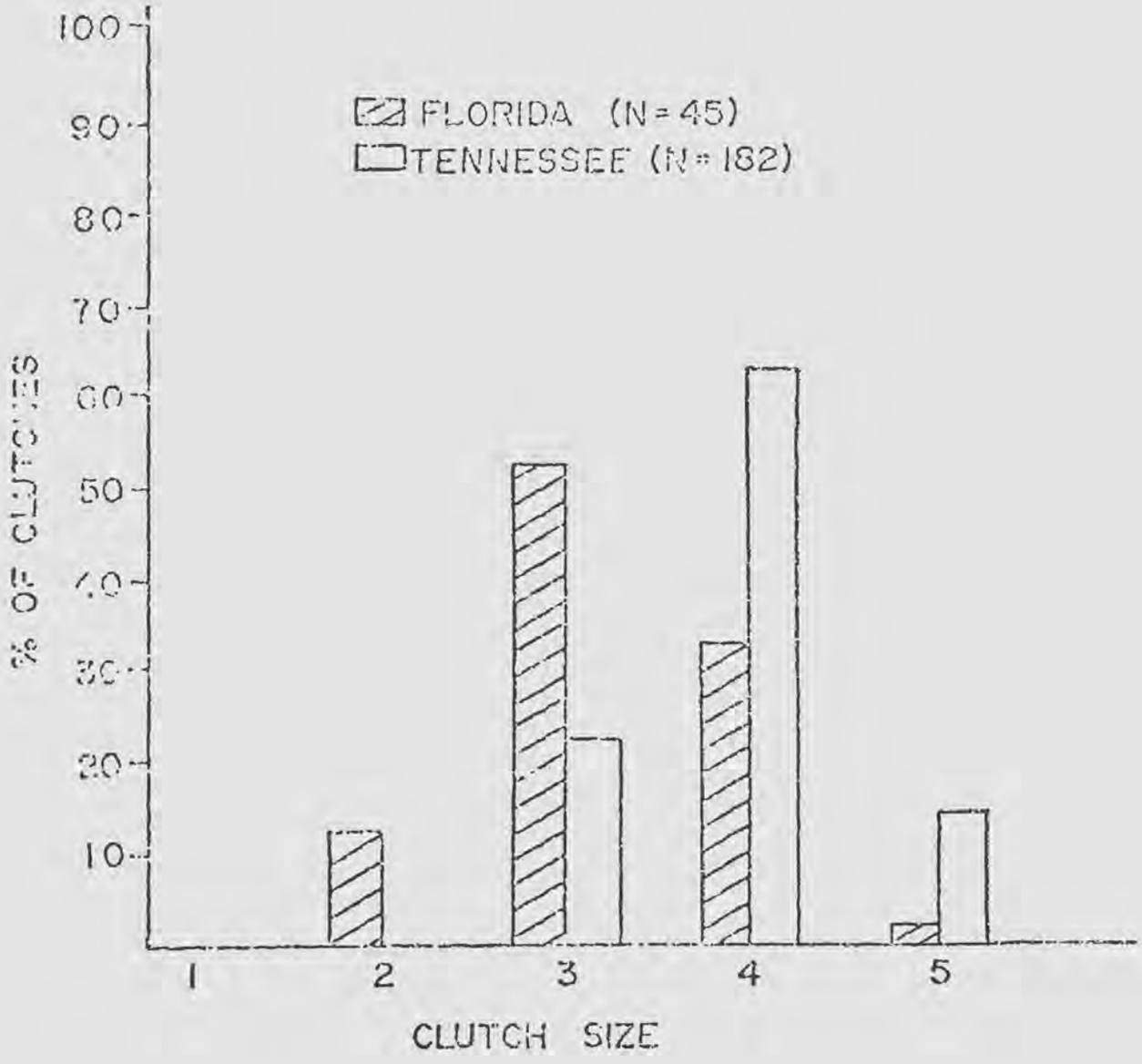
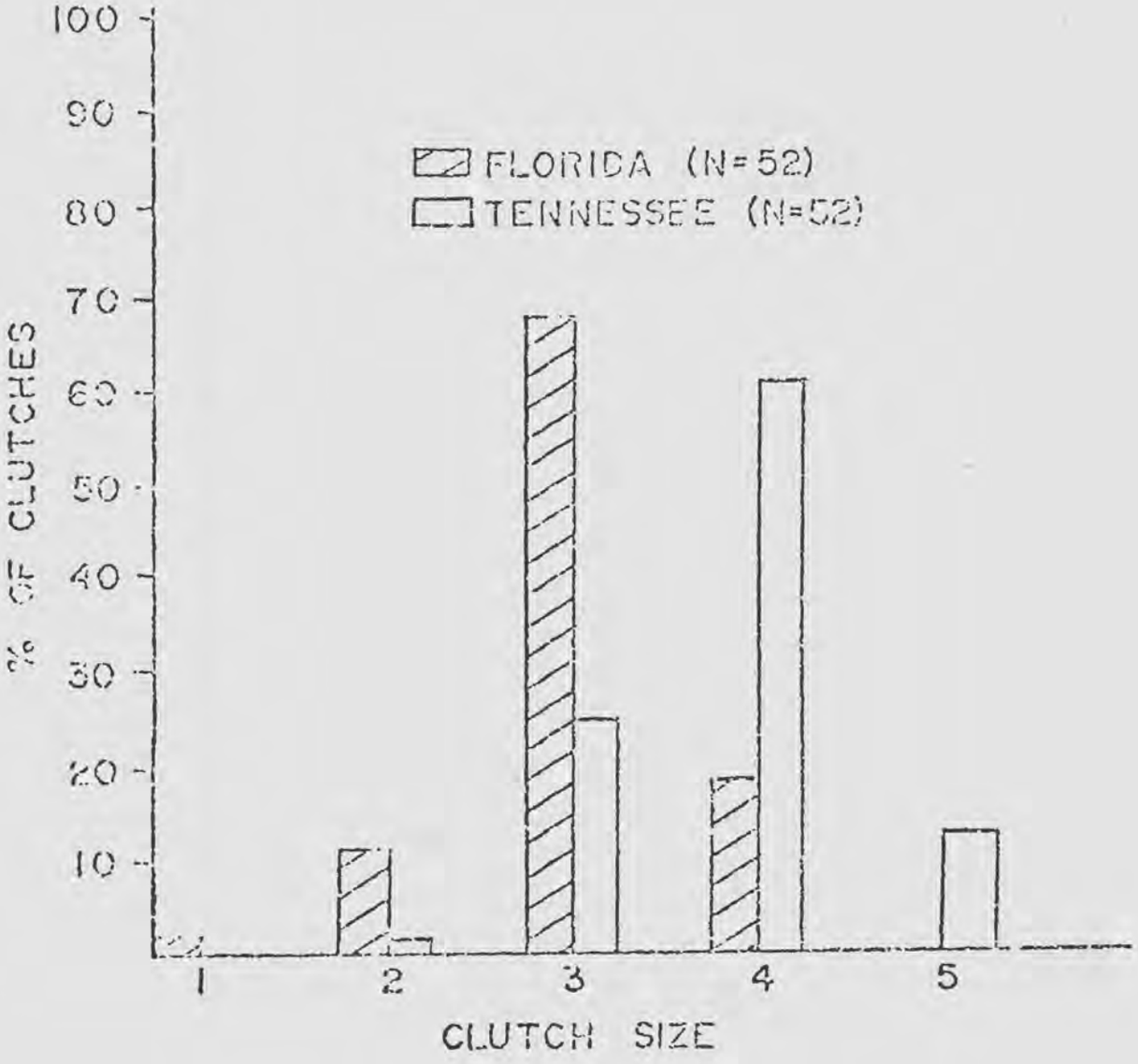

100
90
80
70
60
50
40
30
20
10
% OF CLUTCHES
FLORIDA (N=45)
TENNESSEE (N=182)
1
2
3
4
5
CLUTCH SIZE

Figure 2. A comparison of clutch size between Brown Thrashers nesting in central Florida and those nesting in Tennessee. (Tennessee data from Erwin, 1935)


100
90
80
70
60
50
40
30
20
10
% OF CLUTCHES
FLORIDA (N=52)
TENNESSEE (N=52)
1
2
3
4
5
CLUTCH SIZE

(Averill 1933, Lack 1947, 1948, 1954, and Moreau 1944). Possible factors causing variation in clutch size are widely discussed in the literature (Cody 1966, Ricklefs 1970, and Williams 1966).

When clutch size for each species was compared intraspecifically, Mockingbirds averaged slightly larger clutches in 1974 than in 1975, although the difference was not significant ($t = .36$). Brown Thrashers had a larger mean clutch size in 1975 than in 1974, but the difference was not significant ($t = .77$).

Incubation Period

The incubation period was calculated as the elapsed time between the laying of the last egg and hatching of that egg. Both the day the last egg was laid and the day it hatched are counted. Two Mockingbird clutches hatched after 13 days of incubation and two hatched after 14 days. In two Brown Thrasher nests, the eggs required 13 and 15 days to hatch. These periods are slightly longer than those reported in other studies. In Tennessee, Laskey (1962) found the incubation periods for 18 Mockingbird clutches to range from 12 to 12.5 days. Erwin (1935) found the incubation period for 17 Brown Thrasher clutches to extend from 11 to 14 days. Eggs in 15 of the 17 nests hatched in 12 or 13 days.

Hatching Success

In 1975, the eggs in six (21%) of the 28 Mockingbird nests were lost before they hatched. Brown Thrashers were less successful; 16 (43%) were lost prior to hatching. Erwin (1935) found similar egg

losses in his study of Brown Thrashers in Tennessee.

Predation was believed responsible for nearly all nests lost before the eggs hatched. Eggs in one Mockingbird nest located near a construction site failed to hatch because of parental abandonment.

Some nests had partial egg loss. Mockingbirds lost one egg from each of four clutches; the remaining eggs in those nests successfully hatched. Three of these losses were attributed to infertility or failure of the embryo to develop, and in the remaining clutch, one egg disappeared.

Brown Thrashers had a higher loss of individual eggs. Ten eggs were lost from otherwise successfully incubated clutches. Five of these losses were attributed to infertility or failure of the embryo to develop, four disappeared, and one was cracked. The cracked egg eventually disappeared from the nest. It had started to rot and one of the adults apparently removed it from the nest.

Nestling Success

For purposes of analysis, each nestling was assigned to the month in which most of its nestling period occurred (i.e., a bird hatching on 27 June would be considered a July bird since the majority of its nestling period occurred during July). The number of nestlings present each month and their mortality are in Figures 3 and 4.

Mockingbirds in 1975 showed little variation in the number of nestlings present each month (Figure 3). Brown Thrashers in 1975, however, had fewer nests in April and May than in June and July.

Figure 3. Number of Mockingbird nestlings present each month and their eventual fate.

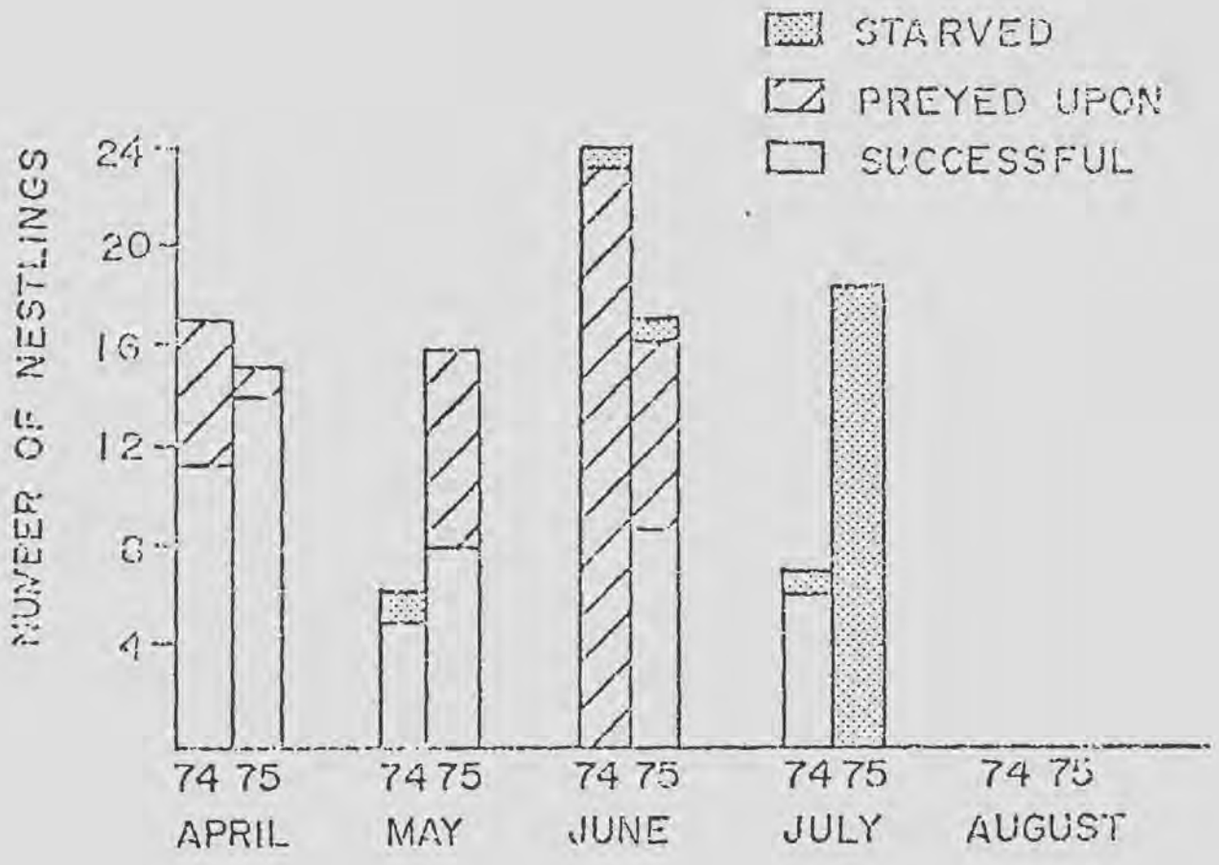
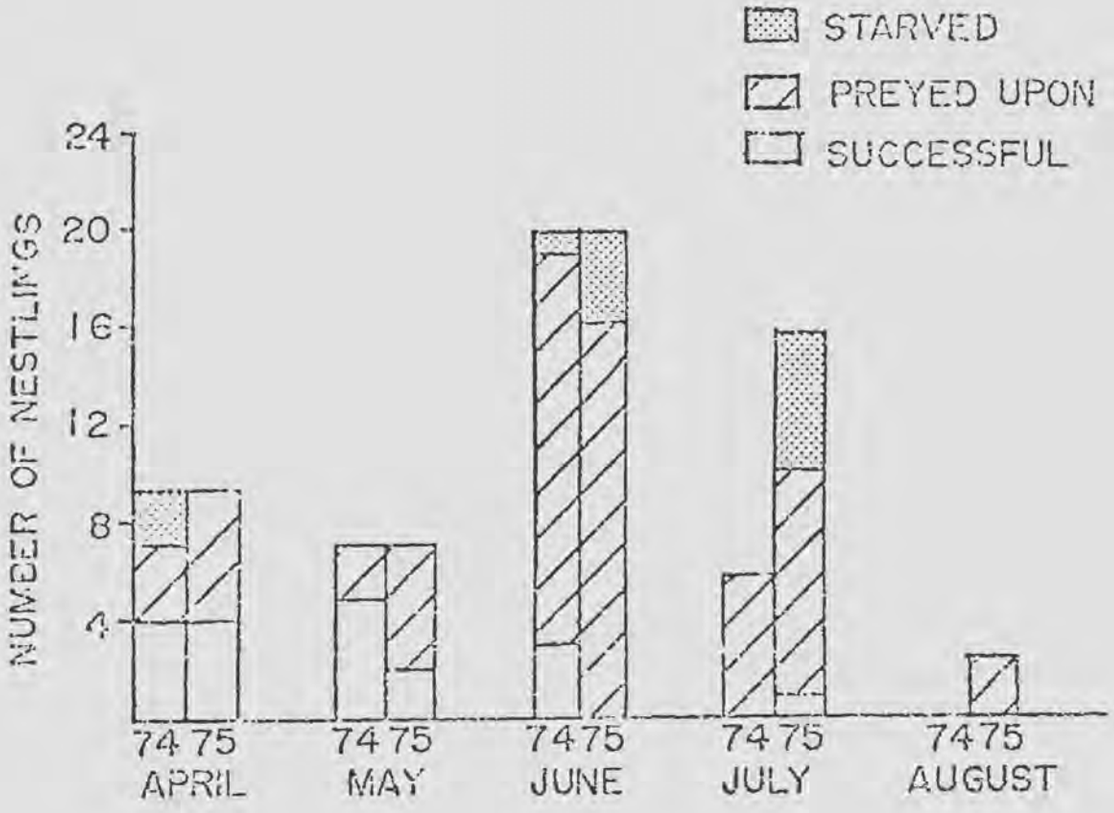

STARVED
PREYED UPON
SUCCESSFUL
NUMBER OF NESTLINGS
24
20
16
12
8
4
74 75
APRIL
74 75
MAY
74 75
JUNE
74 75
JULY
74 75
AUGUST

Figure 4. Number of nestling Brown Thrashers present each month and their eventual fate.


STARVED
PREYED UPON
SUCCESSFUL
NUMBER OF NESTLINGS
24
20
16
12
8
4
74 75
APRIL
74 75
MAY
74 75
JUNE
74 75
JULY
74 75
AUGUST

More Brown Thrashers were present in June than at any other time, and their numbers gradually decreased throughout July and August (Figure 4).

Although 1974 data are included in Figures 3 and 4, they are probably less reliable indicators of breeding rates for each month because of the methods used in locating nests that year.

Brown Thrashers had a higher mortality than did Mockingbirds. In 1974 and 1975, 41% and 46% of the Mockingbird nestlings fledged, respectively. This compares with only 22% fledging success for Brown Thrashers in 1974 and 13% in 1975. Some of this difference is probably due to Brown Thrashers nesting later in the season. In both species, late nests were less successful than early nests. Therefore, since more Brown Thrashers nested late in the season, a larger percentage of them was subjected to the increased mortality experienced by both species late in the season. This is only a partial explanation, however, since a monthly analysis of failures compared with successes showed that Brown Thrashers had consistently lower fledging rates (see Figures 3 and 4).

A possible factor which could contribute to low Brown Thrasher fledging rates is that the species occupies a habitat that is not optimum for its nesting. As mentioned earlier, Florida represents the southernmost extension of the Brown Thrashers breeding range.

Behavioral differences in the two species may also be an important factor associated with nestling mortality. Mockingbirds were more secretive at the nest site than were Brown Thrashers.

Mockingbirds usually did not make their presence known until I got close to their nests. Even then, their protests were less vociferous than those of the Brown Thrasher. Brown Thrashers usually began scolding as soon as I approached the vicinity of their nest site. They continued their loud protest as long as I was in the area. It is possible that the loud scoldings and vigorous activity alerted potential predators to the location of their nest sites. I did not observe the reaction of either species to other than a human intruder. Hailman (1963), however, found that Mockingbirds were more likely to become agitated and display before intruders other than humans. Perhaps Mockingbirds are more habituated to humans than are Brown Thrashers.

Nestling survival varied considerably among months and between years (Figures 3 and 4). Fledging success in Mockingbirds for April of 1974 and 1975 was 66% and 93%, respectively. In Brown Thrashers, the survival rate for April of both years was 44%. The fledging rate for Mockingbirds in May of 1974 was 83%; in May of 1975 the rate was 50%. Brown Thrashers were successful 71% of the time in May of 1974 and 29% of the time in May of 1975. April and May were the periods of highest survival for both species. The lower mean success rates in June and July may have been partially caused by the onset of peak Brown Thrasher breeding. An increase in Brown Thrasher breeding would raise the total number of nestlings requiring food, as well as increasing a predators chance of developing a search image for a common prey item. No Mockingbirds fledged in June of

1974, but 54% fledged in June 1975. The decline in Brown Thrasher survival was more precipitous. Only 15% of the Brown Thrashers in June 1974 fledged. None fledged in June 1975. In July 1974, Mockingbird survival increased to 86%. However, in July of 1975, no Mockingbirds survived. No Brown Thrashers survived in July of 1974 and only 6% survived to fledging in July of 1975. Three eggs in a Brown Thrasher nest hatched during August 1975. These were the only August nestlings found, and all were lost to predation early in the nestling period.

Nestling Mortality

I attributed all nestling losses either to predation or starvation. If a nestling appeared in good health the evening prior to its disappearance, it was considered lost to predation. Nestlings which showed an obvious decline in physical condition prior to their disappearance were considered victims of starvation. Predators typically did not leave any evidence of their presence. Egg shells were found in three nests. In one of these, Great Horned Owl (Bubo virginianus) feathers were found in the nest. A snake trail led to and from a nest tree where 3 Mockingbird nestlings disappeared.

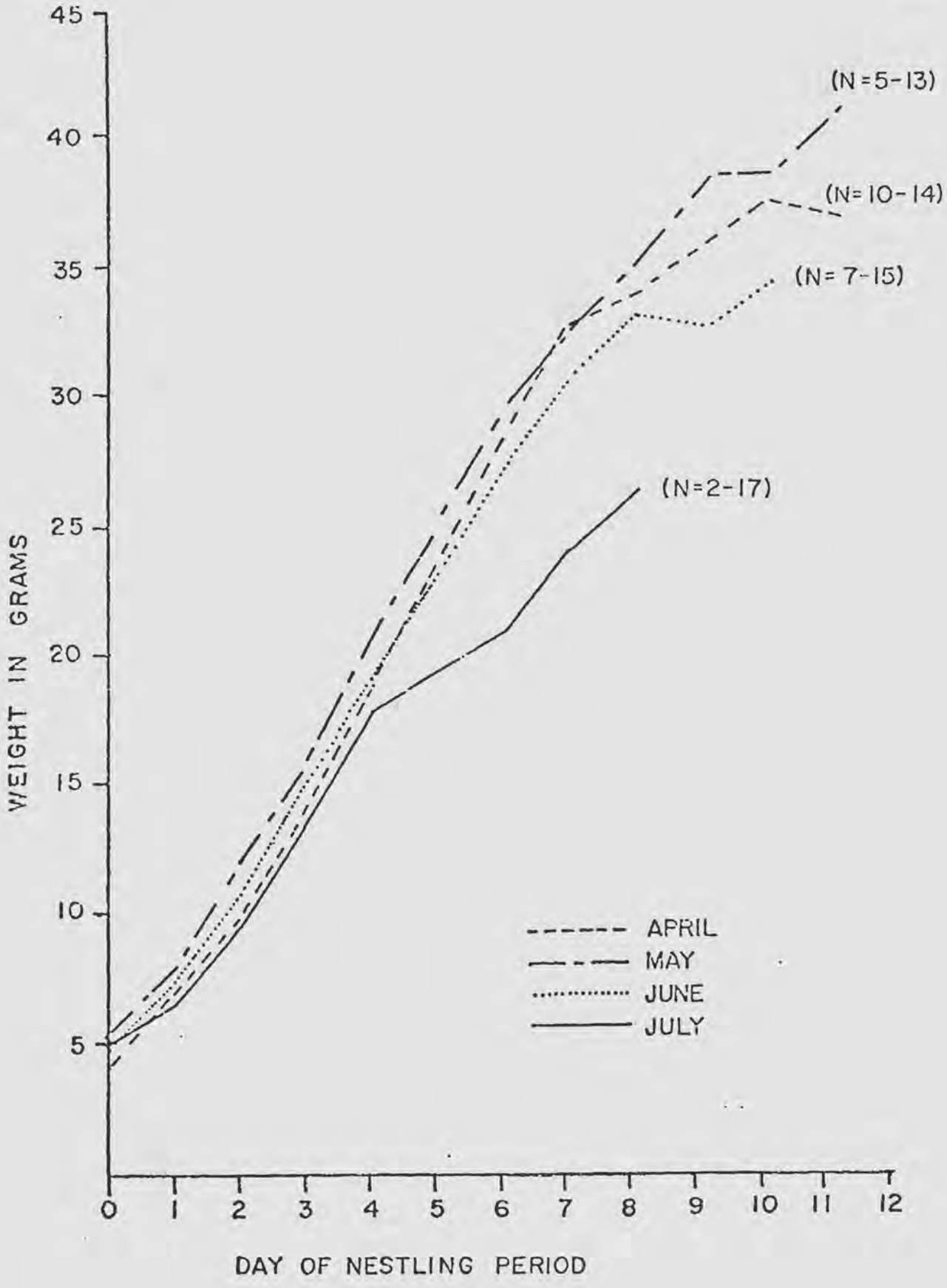
Predation was the chief cause of nestling losses in both years. Starvation was a negligible factor until June and July (Figures 3 and 4). One Mockingbird out of 54 individuals (2%), and two Brown Thrashers out of 32 (6%) starved in April and May. These three incidents appeared to be caused by parental abandonment. The number of nestlings lost to starvation increased to seven in June; five

were Brown Thrashers (12.5%) and two were Mockingbirds (5%). Starvation was highest in July. This was especially true in 1975 when six out of 16 (37%) Brown Thrashers and 18 out of 18 (100%) Mockingbirds starved. Furthermore, six of the nine Brown Thrasher losses in July 1975 which were attributed to predation occurred prior to the age where starvation is usually manifested. If these nestlings had not disappeared early in the nestling period, they too may have succumbed to starvation. The continued attempts at nesting in July 1975 were unexpected in light of Ricklefs' (1965) statement that: "It is theoretically possible that not one nestling would end up well fed in extremely hard times, but the birds would not be likely to breed under such circumstances." It is possible that some of the nestlings whose deaths were attributed to starvation may have been taken by a predator, but the birds were in deteriorating health and I do not believe they would have survived in any event. The increased starvation in July 1975 may be a result of the following three factors: (1) Fly larvae, which parasitized nestlings of both species throughout the season, became a worse problem as the season progressed. Several of the parasites removed from a nestling Mockingbird were identified as Philornis sp. Allen and Nice (1952) found similar parasites of Purple Martins occurred only late in the season. I do not know if the increased parasitism late in the season in this study was caused by the poor health of the nestlings or if it was an important factor contributing to the poor health. Both may be partially true. The effect of insect parasites on birds has been

discussed in the literature, but with little agreement as to its effect on survival (see Hicks 1959 and references cited therein). (2) By July, the adults are beginning to molt, placing added energy demands on their systems. At least some species cannot feed nestlings and meet the added energy demands of molting (Kendeigh 1949, Pitelka 1958, and Morehouse and Brewer 1968). Michener (1953) found that Mockingbirds in California began molting by midJuly or early August and had completed the molt by October. Also, many Brown Thrashers had several of their tail feathers missing late in the season. (3) As a result of changing hormone levels, adults may have begun to lose interest in their young late in the season. Although these factors may have contributed to the increased starvation late in the season, the much greater number of birds starving in 1975 indicates that yearly fluctuation in food availability must be an important factor.

July birds of both species in both years tend to weigh less than their counterparts weighed earlier in the season. This difference is especially great in 1975 (Figure 5). In 1975, Mockingbirds were heaviest in May followed by April and then June birds. None of the July birds survived beyond day eight. Brown Thrasher nestlings in 1975 showed a similar trend. April nestlings were heaviest followed by May birds. June birds did well until day five, at which time their average weight began to decrease. All June nestlings were lost to predation or starvation. July nestlings were the lightest.

Figure 5. A comparison by month of the mean daily weights of nestling Mockingbirds in 1975. (Numbers in parentheses represent range in sample sizes for each month).


45
40
35
30
25
20
15
10
5
WEIGHT IN GRAMS
(N=5-13)
(N=10-14)
(N=7-15)
(N=2-17)
APRIL
MAY
JUNE
JULY
0
1
2
3
4
5
6
7
8
9
10
11
12
DAY OF NESTLING PERIOD

Unlike 1975 birds, July 1974 nestlings did not always weigh less than their counterparts from earlier months. Mockingbirds in May of 1974 were unusually small and did not outweigh July birds until the tenth day. The unusually low average weight of May nestlings was caused by three nestlings from a single nest. This nest was located in a small orange tree near a research trailer. On the fourth day of the nestling period, the adult was frightened off the nest when a researcher left the trailer at 0200. Following this incident, the nestlings gained no weight until day seven. These nestlings did not fledge until day 15. This was the longest nestling period I recorded for a Mockingbird. Similar cases of temporary abandonment have been reported for Vesper Sparrows (Pooecetes gramineus) and Hermit Thrushes (Catharus guttata) (Perry and Perry 1918). Brown Thrashers in 1974 had similar mean weights for each month. July birds did not weigh less than the birds from other months. However, all July nestlings were lost prior to day five, which is the day when most nestlings first showed signs of starvation.

Asynchronous Hatching

Asynchronous hatching has been reported for many avian species and is believed to be an immediate way to adjust clutch size (Lack 1954, Ricklefs 1965). In asynchronous hatching the eggs do not hatch at the same time. Theoretically, the nestling from the last egg to hatch is smaller and less able to compete with its larger nest mates. During periods of food shortage, the smaller nestling starves to death which reduces the energy demands on the parents.

Although I visited the nests once a day, I frequently observed asynchronous hatching in both species in both years. The greatest degree of hatching synchrony occurred in April and May broods. In these months, hatching of the eggs usually occurred within one or two days, although one Mockingbird clutch in May 1974 and another in May 1975 required three days to hatch. None of the April or May clutches showed brood reduction. Even when the youngest nestling was two days behind its siblings, it weighed nearly the same as its older nest mates at a given age. The most asynchronous hatching occurred in June. Most June clutches required three days to hatch; one Mockingbird clutch in June 1974 required five days to hatch. There were three Mockingbird nests and two Brown Thrasher nests in June where asynchronous hatching may have resulted in brood reduction. The June Mockingbird nest in which the second egg required four additional days to hatch resulted in brood reduction. The smaller bird died the day after it hatched. The nest contained a third egg which disappeared on the same day as the nestling. The reason for the large difference between the hatching times of the eggs in this nest is not known. The clutch may have been the product of two females who deposited their eggs at different times. In another June Mockingbird nest, the smaller bird was one day younger than its nest mate. This nestling consistently lagged in growth and remained in the nest at least three days after its nest mates had fledged. The bird disappeared on the fourth day. When I last visited the nest, the nestling was still underdeveloped but

active. This nestling probably fledged, although a predator may have taken it. In the third Mockingbird nest, the fourth and last hatched nestling was only one day behind its siblings. Although this nestling did not weigh significantly less, it disappeared on the third day. The three remaining birds survived to fledging, but were lighter than average. A similar instance occurred in a Brown Thrasher nest which contained two young. The second egg hatched one day after the first. The younger nestling fell slightly behind on day four. It continued to lag behind in growth until its disappearance on day six. Its nest mate disappeared on day eight at which time the bird was above average weight. In these instances it seems possible that the younger nestlings may have been taken by a predator which took only one nestling at a time. Another instance of brood reduction occurred in a Brown Thrasher brood of four young. Two of the young hatched on the first day, one hatched the following day, and one hatched on the third day. The youngest nestling lagged in development and disappeared by day five. It had weighed only 7.9 g on day four. The nest began to deteriorate on day five. When I returned on day six, I did not find the oldest nestling; the next oldest nestling remained in the nest, and the youngest surviving nestling was found hanging from the crotch of the nest tree. Its neck was badly cut and its weight had decreased from 25.7 g on day five to 19.7 g on day six. I put the injured bird back in the nest. The following day, the injured nestling was in the nest dead. Its weight was 17.5 g. The only surviving sibling was on the ground

below the nest; its weight had decreased from 27.7 to 26.6 g. I put this young back in the nest. I found the bird on the ground again on day eight. Its weight had increased to 27.8 g. I replaced the deteriorated nest with another Mockingbird nest that had been used earlier in the season. The surviving nestling was put in this nest. By day nine, its weight had increased to 30.1 g. The bird appeared healthy, but it was undersized and its legs were weak. Unfortunately, when I returned the following day the second nest had fallen apart; the last nestling was on the ground dead, apparently a victim of starvation. The above might indicate that adults will continue to feed nestlings on the ground, but at reduced rates. Conversely, it is possible that the nestling was on the ground for only a short period of time before I found it and could maintain its weight without being fed by the parents for that period of time.

Asynchronous hatching occurred in July for both species, but clutches requiring one day to hatch were common; only two clutches required two days to hatch. Four Brown Thrasher and six Mockingbird nests in July had brood reduction. In all but two of these, one of each species, the first nestling lost was not the youngest, and in all but one of these, all other members of the brood were eventually lost. This remaining nest contained three eggs, but only two hatched. The youngest nestling was probably over one day younger than its older sibling. It weighed 4.1 g on day zero, 4.7 g on day one, and had disappeared by day two. Its nest mate fledged on day 11. The

bird weighed 46.1 g on day 10. It was one of the heaviest nestlings for that age. The decrease in asynchrony during the month of July was unexpected since July, at least in 1975, was the time when most nestlings starved. The above seems to indicate that asynchronous hatching was not an important mechanism for adjusting brood size in Mockingbirds and Brown Thrashers during periods of low food availability in central Florida.

Description of Nestlings

Day Zero: Mockingbird and Brown Thrasher nestlings closely resemble each other at day zero. Brown Thrashers average slightly heavier in weight, but the difference is not readily discernible.

The natal pterylosis of the two species is quite similar. Both possess down in the capital, spinal, ventral, crural, humeral, and femoral tracts. The down in the capital tract forms a ring around the crown of the head and is confined to the frontal, superciliary, and base of the occipital regions. A row of down occurs along the eyelid. The spinal tract contains down in the dorsal and pelvic regions. The ventral tract contains down in the abdominal and posterior ventral regions. The amount of down in the abdominal region will usually distinguish the two species. Mockingbirds have down along the entire length of the abdomen, whereas the down of the Brown Thrasher is typically limited to a few tufts on the posterior portion of the abdomen. The caudal tract usually consists of two tufts of down; one on each side of the area where the undertail coverts will appear. Down-like structures attached to the tips of

the not yet visible rectrices are frequently present on this day, but occasionally do not appear until the first or second day. These down-like structures are darker and more wirey in texture than typical down. They may represent the very minute and "exasperatingly variable" feather structures which Wetherbee (1957) observed on the remiges and rectrices. The occasional appearance of these structures on days one and two is attributed to their being pushed through the skin by developing rectrices. Structures similar to these are often found in the primary region of the alar tract. Down in the humeral tract occurs in the axillary (scapular) and marginal covert (ulnar) regions. The crural tract appears as two parallel lines of several down tufts.

The skin of both species is pink on day zero and there is little difference between the color of the dorsal and ventral surfaces. The color of the bill and legs differs in the two species. These structures are more pink in the Brown Thrasher, whereas the bill of the Mockingbird is more yellow and the legs are more flesh-colored. The oral flanges are useful in distinguishing nestlings of the two species. Both species possess large flanges, but in the Brown Thrasher, they are much whiter than the bright yellow flanges of the Mockingbird. The mouth lining of both species is a bright yellow-orange.

The nestlings are typical altricial young. When lying undisturbed in the nest, both species rest on their abdomens with their heads flopped forward. The legs are not used and the bird

frequently lists to one side.

Both species beg indiscriminately at any disturbance; they often gape for no apparent reason. When gaping, the birds raise their heads straight up and extend their necks as much as possible. They usually remain resting on their abdomen, but they occasionally push themselves up until they are resting on their tarsi. The birds frequently attempt to use their wings when pushing themselves up into that position. It is not unusual for a nestling to fall onto its back from this begging position. When this happens, the nestling usually continues to beg. If the bird does not lose its balance and topple over, it will remain with its neck extended and mouth open until it tires. Soft peeping sounds are uttered almost continuously by the newly-hatched young.

Nestlings at this age show no fear and appear totally unaware of their surroundings. If placed in an uncomfortable situation, only a few individuals could right themselves.

Days One and Two: There is little change in the behavior or appearance of the birds. They are slightly larger and appear fluffier. The skin of the dorsum is more red, probably as a result of developing dorsal muscle masses. The developing feather tracts are more visible through the skin. The wings are scalloped along the rear margin indicating the location of future primaries. The developing remiges form a dark line beneath the skin.

Behaviorally the birds have changed slightly. The chief difference is in their increased ambulatory abilities. Birds when

placed on a flat surface can crawl, using the wings and feet for pushing and pulling. The movements are uncoordinated and lack direction. The nestlings frequently open and close their toes.

Day Three: By this day, the nestlings of both species have increased considerably in size. Mockingbirds average about 14.3 g in weight, whereas Brown Thrashers averaged about 15.9 g. Most of the pterylae are visible and in some nestlings the underlying feathers have emerged through the skin. The eyes of some nestlings have begun to open.

There is little change in the behavior of nestling Mockingbirds. Brown Thrashers, however, are less active and in some cases more discriminating in their begging response. This might be associated with opening their eyes. Hoyt (1957) found that woodpecker nestlings would no longer gape towards an offered finger once their eyes opened; presumably the birds could see what was being offered to them.

Both species, when placed on a flat surface, would scoot about by propelling themselves with their wings and legs.

Day Four: Increased feather development has occurred. Mockingbirds continued to beg indiscriminately, and the soft peeping sounds first heard on day zero are louder, especially when the nestling is first disturbed. Brown Thrashers are less active and more discriminate in their begging activity.

Day Five: In both species, most of the feathers are now protruding well beyond the skin. Many of the feathers are beginning to

unsheath. This is especially true of the feathers in the ventral tract.

Fear was displayed in some nestlings. Birds when startled would chirp loudly. A behavior which Rand (1941) termed "juvenile defense" was first observed in both species on this day, although it was more common in Brown Thrashers. In this behavior, the mouth was opened widely as though gaping, but the head and neck instead of being stretched out, were pulled into the shoulders. Rand (1941) found that Curve-billed Thrasher (Toxostoma curvirostre) nestlings frequently adopted this posture when confronted with a fearful or ambiguous situation. Similar situations elicited the behavior in both Mockingbird and Brown Thrasher nestlings. The behavior appeared to be associated with begging since it was not unusual for a nestling to go directly from the juvenile defense posture to the gaping posture. Furthermore, if something, such as the end of a pencil, was offered to a nestling in the juvenile defense position, it could almost always be induced to change to the typical begging posture. Sometimes it was difficult to distinguish between juvenile defense and begging. Despite occasional juvenile defense displays, most Mockingbirds showed no indications of fear. They frequently begged almost continuously, even while being held and measured. Brown Thrashers were less active. They usually begged briefly when first disturbed, but quickly ceased when I lifted them from their nest. Once removed, they frequently pulled their heads down between their shoulders and held their tightly clenched feet close to their

ears. Frequently they remained stationary in this position with the exception of constant clasping and unclasping of their toes. They sometimes remained in that position even when rolled onto their sides.

Day Six: The feathers of both species continue to fray; the body feathers show the greatest amount of unsheathing. The remiges and rectrices are slightly frayed at their edges. The brown coloration of the Brown Thrasher and the gray coloration of the Mockingbird are obvious.

The young of both species huddle in the nest and grasp the nest lining. This occurred especially when the parents were scolding. Mockingbirds frequently appeared ambivalent, seemingly unable to decide whether to crouch or beg. Brown Thrashers, though more likely to crouch than Mockingbirds, were less likely to grasp the nest lining. Mockingbirds began to discriminate in their begging response, although not all individuals did this.

Day Seven: Little change in behavior or development was noticed. The remiges still remain largely sheathed. The nestlings' ability to sit when placed outside the nest is greatly improved; their legs rarely spraddled out to the sides as was common in younger birds.

Day Eight: This is the first day either species could perch, even though it was poorly developed. Not all individuals could perch. Brown Thrashers showed an increased tendency to grasp the nest lining. Prior to this day, grasping the nest lining was more typical of Mockingbirds. Several Mockingbirds exhibited both escape behavior and wing-flashing. The two behaviors commonly occurred

together, although the nestlings occasionally wing-flashed when they were weighed. Brown Thrashers usually assumed the freezing position mentioned earlier.

Day Nine: The remiges and rectrices show considerable unsheathing. The degree of unsheathing varied greatly, but the eighth primary in Mockingbirds averaged 4.7 mm of unsheathing (N = 54) and the eighth primary of Brown Thrashers averaged 5.7 mm of unsheathing (N = 23). When given the opportunity to perch on my extended finger, some individuals of both species showed considerable balancing ability, whereas others tended to slide to the side of my finger. Some Brown Thrasher and Mockingbird individuals became motionless when removed from the nest. Wing-flashing and escape attempts were common in Mockingbirds. Brown Thrashers were less likely to attempt an escape; I never observed them to wing-flash. The young of both species were quite vocal. Both species chirped frequently, especially in conjunction with wing-flashing or juvenile defense. One young Mockingbird squawked loudly when its escape attempt was thwarted. This incited the parents, and attracted Common Grackles (Quisculus quiscula) who joined in scolding me. This was the first day I observed individuals of both species to preen their breasts. Horwich (1966) observed preening movements on day one and actual breast preening on day three in Mockingbirds.

Day Ten: The birds are well feathered. Feather quills are not readily visible as the layered effect of the plumage conceals them. A two-tone chirp given by a nestling Brown Thrasher was heard for the

first time. It attracted the attention of the parents as well as several nearby Common Grackles and Blue Jays (Cyanocitta cristata). This will be the last day in the nest for many of the birds, although some will not fledge for one, two, or uncommonly more days.

Nestling Growth

The results of statistical analyses of weights and measurements are presented in Tables 1 through 51 and Figures 5 through 8. Hatching day was termed day zero. The average weights of Mockingbirds ($N = 95$) the evening of hatching was 4.7 g. Brown Thrashers ($N = 64$) averaged 5.3 g. Hatching day weight varied considerably among nestlings. This variation is at least partially caused by differences in the actual hatching time of the birds. The birds grew fairly rapidly initially, but growth gradually tapered off near day seven. Fledging of both species typically occurred between days nine and 12.

Manus, culmen, eighth primary ($r > .95$), and flanges ($r > .86$) were positively correlated with weight. Some variation exists in the slopes of the same parameters during different time periods. Since higher slopes indicate that a given parameter is larger relative to the weight of the bird and smaller slopes indicate that the parameter is smaller relative to weight, it seems possible that some factor must be responsible for the difference in ratios. One possibility is that weight, which is probably more sensitive to the amount of food received than are the other parameters, is likely to be lower relative to the linear parameters during periods of low food availability.

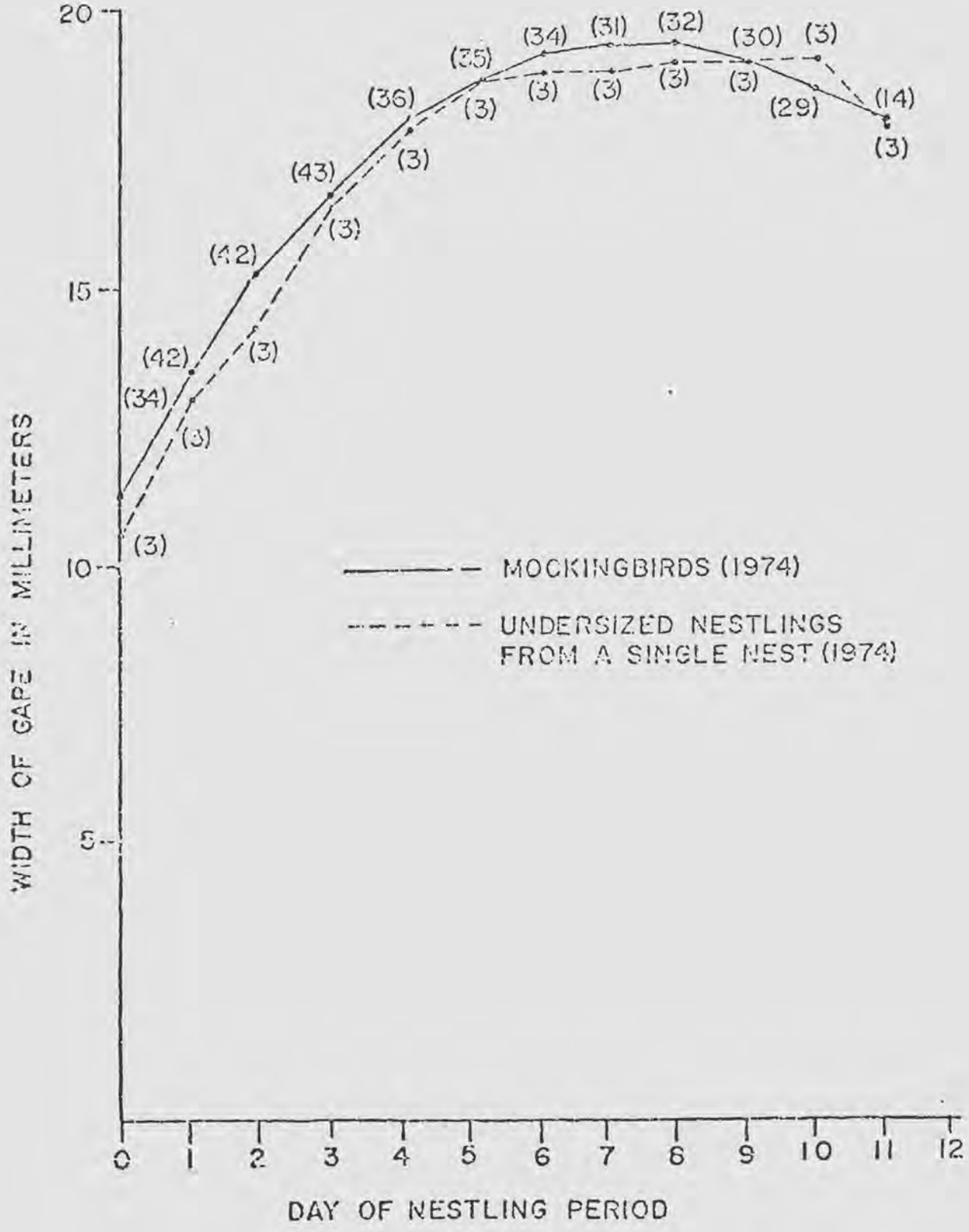
Some credence for this possibility is obtained by calculating regression lines for one Mockingbird and one Brown Thrasher which showed evidence of severe starvation. The weight-manus regression lines obtained for these individuals have slopes of .78 for Mockingbirds and .57 for Brown Thrashers. Both slopes are higher than those obtained using the average weight and manus length of all the birds measured. This supports the belief that weight is more severely retarded than manus length during periods of low food availability. The weight-remix regression lines obtained from the underweight birds were also higher in both Mockingbirds (1.4) and Brown Thrashers (1.2) than in those obtained from all the birds of each species. The weight-gape regression lines obtained from the underweight birds also had much higher slopes in both the Mockingbird (.25) and Brown Thrasher (.25). However, in the case of the weight-culmen regression line, only the underweight Mockingbird yielded a relatively larger slope (.16). More data are needed before any conclusions can be reached, because the above slopes were obtained from a single nestling of each species. These were the only seriously underweight nestlings in this study which survived long enough to allow the calculation of regression lines from their growth parameters.

T-tests were performed to ascertain if there were any significant intraspecific differences between the growth rates of 1974 and 1975 nestlings. In Mockingbirds, there was no significant difference in weight between years (Table 1). The manus was significantly

longer on days zero, two, three, and six through ten in 1975 (Table 6). The culmen (days one, two, and five) (Table 11) and the eighth primary (days four through ten) (Table 21) were also significantly longer in 1975. If the earlier supposition is true that linear growth parameters are more reliable than weight (i.e., not as readily affected by changes in the nutritional state of the bird) then these differences in linear measurements between the years could be explained on that basis because Mockingbird nestlings in 1975 starved more frequently than did 1974 nestlings. Therefore, the underweight young in 1975 would tend to decrease the average weight of 1975 nestlings more than they would decrease the average length of the wing or remiges. The gape was significantly wider (days nine through 11) in 1974 (Table 16). The gape frequently began to decrease in size later in slower growing nestlings (Figure 6). Therefore, smaller nestlings typically had larger gapes late in the nestling period.

I compared the growth rates for the two years on a monthly basis to determine when the largest difference occurred. The average weights for April Mockingbirds in both years were similar until days nine through 11, when 1974 birds were significantly heavier (Table 2). The manus (days six through eight) (Table 7), culmen (days zero, one and six through 10 (Table 12), and eighth primary (days five through 11) (Table 22), however, were all significantly longer in 1975. The gape was significantly wider in 1974 on days nine and 11 (Table 17).

Figure 6. A comparison of mean gape development for all 1974 Mockingbirds with that of undersized nestlings from the same year. (Numbers in parentheses indicate sample sizes).


20
15
10
5
WIDTH OF GAPE IN MILLIMETERS
(42)
(34)
(3)
(42)
(3)
(43)
(3)
(36)
(3)
(35)
(3)
(34)
(3)
(31)
(3)
(32)
(3)
(30)
(3)
(29)
(14)
(3)
MOCKINGBIRDS (1974)
UNDERSIZED NESTLINGS FROM A SINGLE NEST (1974)
0 1 2 3 4 5 6 7 8 9 10 11 12
DAY OF NESTLING PERIOD

May Mockingbirds tended to be larger and heavier in 1975. They weighed significantly more on days zero through six (Table 3). Their manus was significantly longer (days zero through nine) (Table 8), and the culmen was longer (days two through 11) (Table 13), and the eighth primary was longer on days four through 11 (Table 23). The gape was wider on day one in 1975 and day 10 in 1974 (Table 18). The smaller size of May birds in 1974 was at least partially a result of nestlings from Nest 12 whose slow growth rate was discussed earlier.

June nestlings were approximately the same size per given age in both years (Tables 4, 9, and 24). The only significant difference occurring when the culmen was significantly longer on day seven in 1974 (Table 14) and the gape wider in 1975 on day five (Table 19).

In July, Mockingbirds from 1974 were significantly heavier (days five through eight) (Table 5), had a longer manus (days five through eight) (Table 10), a longer culmen (days four through eight) (Table 15), and a longer eighth primary (days six through eight) (Table 25) than nestlings measured in 1975. There was no significant difference in the width of the gape (Table 20). These differences in size were expected since all 1975 July Mockingbirds starved prior to day nine.

Brown Thrasher nestlings were similar in size during 1974 and 1975 (Tables 31, 36). However, 1974 nestlings were heavier on days two, three, and seven (Table 26), had a longer eighth primary on days two through eight (Table 46), and wider gapes on days seven through nine (Table 41). I do not believe these differences indicate a

difference in the rate of growth between the years, but rather a difference in the form of the growth curve since the differences occur at the midale of the growth curve; (i.e., nestlings from both years are approximately the same size at hatching and fledging).

April Brown Thrashers were also fairly similar in size (Table 27 and 42) although 1975 birds had a significantly longer manus (days zero, two, and seven) (Table 32), a longer culmen (day eight) (Table 37), and a longer eighth primary (days seven through nine) (Table 47).

May birds showed no significant difference between 1974 and 1975 in any measurement (Tables 28, 33, 38, 43, and 48).

July Brown Thrashers were also quite similar (Tables 30, 35, and 50), differing only in that 1974 nestlings had a longer culmen (day four) (Table 40) and wider gapes (days zero and three) (Table 45). This is surprising at first since, as with Mockingbirds, a large number of birds starved in July of 1975. However, as mentioned earlier, starvation is rarely manifested prior to day five and no growth comparisons between July 1974 and July 1975 birds could be made beyond that day since all 1974 birds were lost prior to day six. Even July 1975 Mockingbirds, all of which starved, did not differ significantly in growth from July 1974 birds until day five (Figure five).

I also compared the growth parameters of Mockingbirds and Brown Thrashers. Brown Thrashers in 1974 were significantly heavier than were Mockingbirds at almost every age. The difference was not as

great in 1975, but Brown Thrashers were significantly heavier on days zero, one, two, five, nine, and 10 (Figures seven and eight, Table 51).

Brown Thrashers had slower wing growth relative to their body weight than did Mockingbirds. In 1975, when the weight difference between the species was not great, Mockingbirds had significantly longer wings on days four through 11. In 1974, there was no significant difference in the manus length of the two species, but the much greater weight of the Brown Thrashers in this year means that their manus length was relatively shorter than that of Mockingbirds (Table 51). This is further demonstrated by the slopes obtained from the weight-manus regression lines for the two species. The slopes for Mockingbirds in both years (.54 and .60) were higher than those obtained for Brown Thrashers (.47 and .49).

Brown Thrashers had significantly longer culmens than did Mockingbirds of the same age. Furthermore, the t-values were considerably larger than the corresponding values from weight comparisons (Table 51). This, combined with the higher slopes obtained for Brown Thrashers from the weight-culmen regression line, indicates that the culmen in Brown Thrashers is longer both absolutely and relatively.

There is little significant difference in the width of the gape in either year. The only significant difference occurred in 1975, when Mockingbirds had wider gapes on day four and Brown Thrashers had wider gapes on days zero and two (Table 51).

Figure 7. A comparison of mean weights of all nestling Mockingbirds and Brown Thrashers from 1974. (Numbers in parentheses indicate sample sizes).

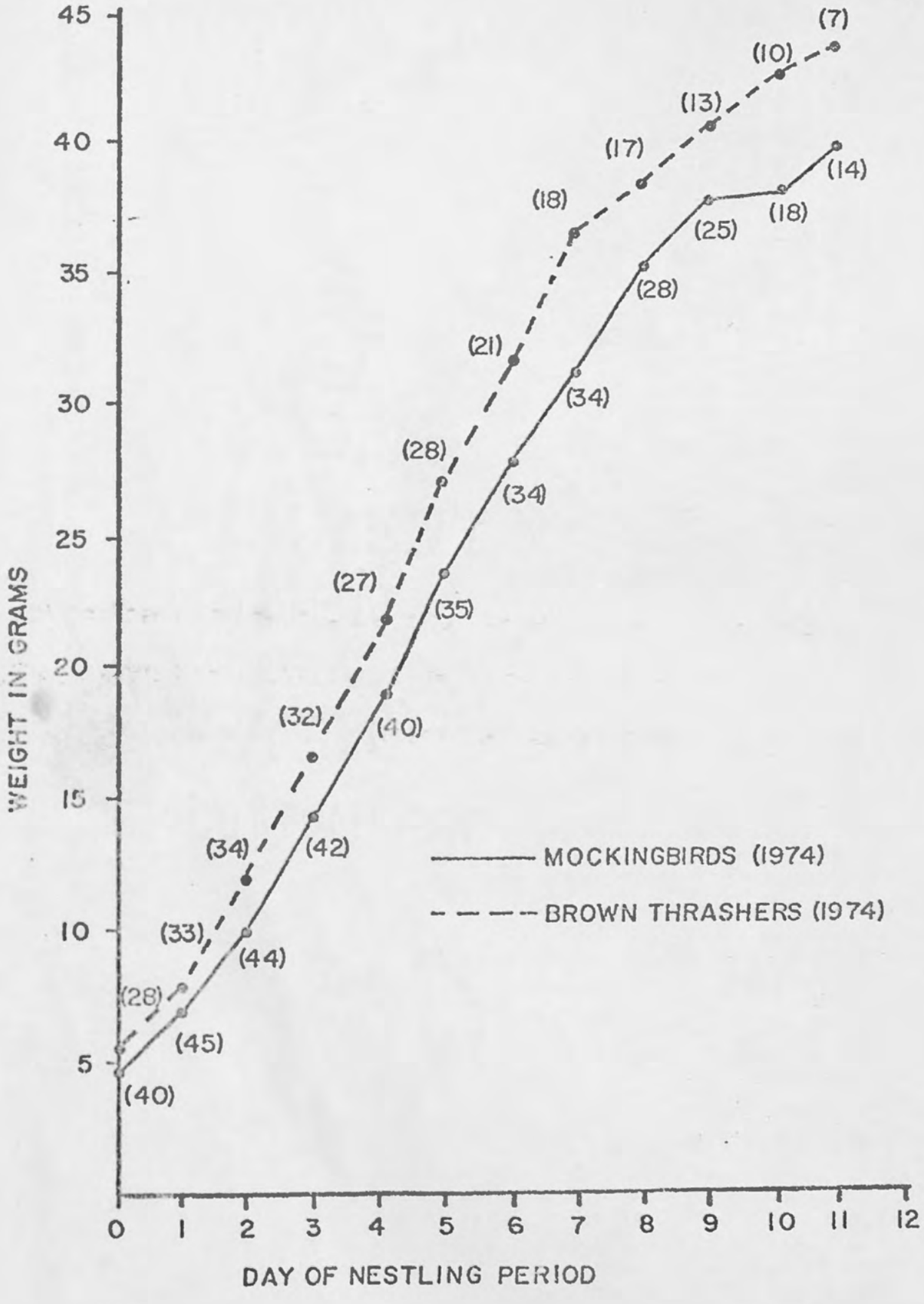
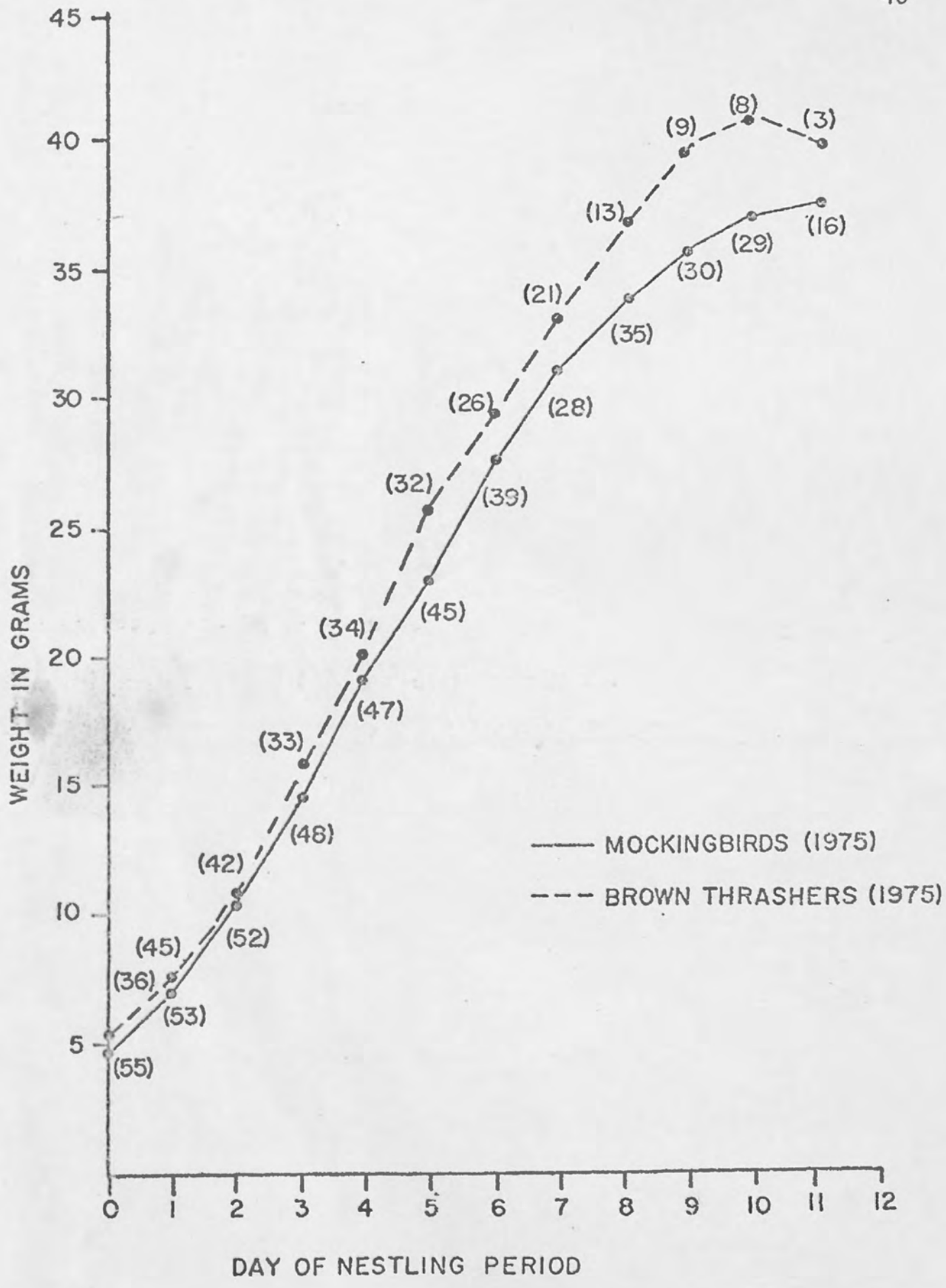

45
40
35
30
25
20
15
10
5
WEIGHT IN GRAMS
0
1
2
3
4
5
6
7
8
9
10
11
12
DAY OF NESTLING PERIOD
(7)
(10)
(13)
(17)
(14)
(18)
(18)
(25)
(28)
(21)
(34)
(28)
(34)
(27)
(35)
(32)
(40)
(34)
(42)
(33)
(44)
(28)
(45)
(40)
MOCKINGBIRDS (1974)
BROWN THRASHERS (1974)

Figure 8. A comparison of mean weights of all nestling Mockingbirds and Brown Thrashers from 1975. (Numbers in parentheses indicate sample sizes).


45
40
35
30
25
20
15
10
5
WEIGHT IN GRAMS
0
1
2
3
4
5
6
7
8
9
10
11
12
DAY OF NESTLING PERIOD
(55)
(36)
(45)
(53)
(42)
(52)
(33)
(48)
(34)
(47)
(32)
(45)
(26)
(39)
(21)
(28)
(13)
(35)
(9)
(30)
(8)
(29)
(3)
(16)
MOCKINGBIRDS (1975)
BROWN THRASHERS (1975)

Mockingbirds had a significantly longer eighth primary in 1975 on all but the eighth day. In 1974, however, Brown Thrashers had significantly longer eighth primaries on days four through eight. This apparent reversal may result from the Mockingbird's eighth primary being slightly longer than the corresponding primary in Brown Thrashers relative to body weight. If so, when the two species are similar in weight, Mockingbirds would tend to have longer eighth primaries as was the case in 1975. In 1974, Brown Thrashers were much heavier than the Mockingbirds and therefore, tended to have slightly longer eighth primaries (Table 51).

TABLE 1 Mean Weights of Nestling Mockingbirds

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	40	4.62	3.3 - 5.9	.14	-1.10
1975	0	55	4.78	2.9 - 5.9	.14	
1974	1	45	6.92	5.2 - 8.6	.11	-1.01
1975	1	53	7.12	4.4 - 9.3	.16	
1974	2	44	9.96	7.4 - 12.9	.12	-0.96
1975	2	52	10.23	6.9 - 12.8	.14	
1974	3	42	14.23	10.9 - 16.4	.10	+0.007
1975	3	48	14.31	9.6 - 18.5	.14	
1974	4	40	19.00	14.7 - 22.0	.10	-0.36
1975	4	47	19.20	9.5 - 25.3	.16	
1974	5	35	23.47	16.5 - 27.9	.12	+0.48
1975	5	45	23.11	15.9 - 30.9	.16	
1974	6	34	27.72	16.1 - 33.9	.15	+0.24
1975	6	39	27.48	17.8 - 35.8	.15	
1974	7	34	31.70	16.1 - 38.8	.16	+0.43
1975	7	28	31.19	19.4 - 37.3	.12	
1974	8	28	35.03	27.2 - 41.5	.11	+1.49
1975	8	35	33.59	21.5 - 40.0	.11	
1974	9	25	37.69	25.7 - 42.3	.09	+1.89
1975	9	30	35.78	20.9 - 41.2	.11	
1974	10	18	37.88	27.2 - 41.5	.10	+0.90
1975	10	29	36.87	24.1 - 43.0	.10	
1974	11	14	39.57	27.2 - 43.7	.11	+1.35
1975	11	16	37.37	25.2 - 43.2	.12	
1974	12	7	38.30	31.0 - 42.4	.10	+ .71
1975	12	4	36.25	28.7 - 42.4	.16	

* is significant at .05 level.

TABLE 2. Mean Weights of Nestling Mockingbirds in April

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	17	4.26	3.3 - 5.1	.10	-0.19
1975	0	14	4.30	2.9 - 5.3	.18	
1974	1	17	6.67	5.2 - 8.0	.10	-0.42
1975	1	11	6.81	4.8 - 8.6	.18	
1974	2	17	9.82	7.4 - 11.7	.12	+0.31
1975	2	14	9.66	6.9 - 12.3	.18	
1974	3	17	14.38	10.9 - 16.4	.11	+1.13
1975	3	14	13.57	9.6 - 17.8	.17	
1974	4	16	19.20	14.7 - 21.6	.10	+0.38
1975	4	14	18.85	14.2 - 23.9	.15	
1974	5	17	23.81	16.5 - 27.9	.12	+0.12
1975	5	14	23.66	18.5 - 30.9	.16	
1974	6	17	28.76	17.0 - 33.9	.15	+0.37
1975	6	12	28.22	23.3 - 31.6	.12	
1974	7	17	32.69	19.0 - 37.2	.14	+0.07
1975	7	7	32.55	27.5 - 36.5	.09	
1974	8	16	35.65	27.2 - 41.5	.11	+1.22
1975	8	14	34.04	30.0 - 38.0	.08	
1974	9	13	39.18	34.4 - 42.2	.05	+3.36*
1975	9	14	35.80	31.3 - 39.9	.08	
1974	10	9	39.75	34.3 - 41.5	.04	+2.24*
1975	10	14	37.20	32.3 - 42.1	.08	
1974	11	8	41.08	39.6 - 43.7	.04	+3.80*
1975	11	10	36.80	32.3 - 39.7	.08	
1974	12	1	40.20	-------	.00	------
1975	12	2	36.95	35.9 - 38.0	.04	

* is significant at .05 level.

TABLE 3. Mean Weights of Nestling Mockingbirds in May

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	4	4.40	3.6 - 5.4	.18	-2.49*
1975	0	12	5.21	4.2 - 5.9	.09	
1974	1	6	6.30	5.4 - 7.6	.14	-3.53*
1975	1	13	7.92	6.2 - 9.3	.12	
1974	2	6	9.35	7.7 - 12.0	.17	-3.67*
1975	2	13	11.47	9.9 - 12.8	.08	
1974	3	4	13.25	11.0 - 15.4	.14	-2.72*
1975	3	13	15.56	13.3 - 18.5	.09	
1974	4	6	18.45	15.8 - 21.7	.14	-2.10
1975	4	13	20.76	17.0 - 24.2	.10	
1974	5	6	21.58	16.5 - 25.7	.17	-2.19*
1975	5	13	24.77	20.1 - 28.4	.10	
1974	6	6	24.35	16.1 - 30.9	.25	-2.51*
1975	6	12	29.36	26.2 - 35.8	.09	
1974	7	6	27.06	16.1 - 34.4	.29	-1.94
1975	7	9	32.40	29.4 - 37.3	.07	
1974	8	5	33.56	27.9 - 38.7	.15	-0.68
1975	8	10	34.87	30.7 - 40.0	.07	
1974	9	6	36.13	25.7 - 42.3	.16	-0.97
1975	9	9	38.10	35.7 - 41.2	.05	
1974	10	6	36.60	27.2 - 40.2	.14	-0.90
1975	10	8	38.56	33.9 - 43.0	.08	
1974	11	6	37.56	27.2 - 43.0	.16	-1.17
1975	11	5	40.96	38.1 - 43.2	.06	
1974	12	5	38.2	31.0 - 42.4	.12	------
1975	12	1	42.4	-------	----	

* is significant at .05 level.

TABLE 4. Mean Weights of Nestling Mockingbirds in June

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	15	4.94	3.5 - 5.9	.14	+1.33
1975	0	12	4.64	3.9 - 5.2	.09	
1974	1	18	7.27	6.2 - 8.6	.10	+1.21
1975	1	15	6.98	6.1 - 7.8	.08	
1974	2	16	10.21	8.5 - 12.9	.12	-0.07
1975	2	13	10.48	8.5 - 11.9	.08	
1974	3	14	14.51	12.6 - 16.2	.08	-0.18
1975	3	8	14.61	13.0 - 16.2	.08	
1974	4	11	19.22	16.8 - 22.0	.09	+0.31
1975	4	10	18.95	15.5 - 21.6	.12	
1974	5	5	24.96	23.0 - 26.8	.05	+1.09
1975	5	10	23.25	16.6 - 26.6	.13	
1974	6	4	28.82	27.1 - 31.1	.05	+0.53
1975	6	10	27.64	18.2 - 32.7	.15	
1974	7	4	32.95	29.3 - 38.8	.12	+0.93
1975	7	10	30.58	19.4 - 35.1	.14	
1974	8	1	33.80	-----	.00	-----
1975	8	9	33.06	21.1 - 37.9	.14	
1974	9	0	-----	-----	-----	-----
1975	9	7	32.75	20.9 - 36.3	.16	
1974	10	0	-----	-----	-----	-----
1975	10	7	34.3	24.1 - 37.4	.13	
1974	11	0	-----	-----	-----	-----
1975	11	1	25.2	-----	.00	
1974	12	0	-----	-----	-----	-----
1975	12	1	28.7	-----	.00	

* is significant at .05 level.

TABLE 5. Mean Weights of Nestling Mockingbirds in July

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	4	5.15	4.7 - 5.7	.07	+0.52
1975	0	17	4.95	3.2 - 5.8	.13	
1974	1	4	7.37	7.1 - 7.9	.04	+0.79
1975	1	14	6.79	4.4 - 8.7	.20	
1974	2	5	10.34	10.0 - 11.1	.04	+1.26
1975	2	12	9.52	7.2 - 11.9	.14	
1974	3	7	14.38	12.2 - 16.1	.09	+0.87
1975	3	13	13.69	11.1 - 17.7	.13	
1974	4	7	18.65	15.6 - 20.3	.08	+0.38
1975	4	10	17.94	9.5 - 25.3	.26	
1974	5	7	23.22	19.3 - 25.3	.08	+2.97*
1975	5	8	19.15	15.9 - 26.4	.17	
1974	6	7	27.61	23.1 - 30.2	.08	+4.50*
1975	6	5	20.90	17.8 - 24.9	.13	
1974	7	7	31.11	26.1 - 32.6	.07	+4.10*
1975	7	2	24.10	-----	.00	
1974	8	6	34.85	32.3 - 37.4	.05	+4.62*
1975	8	2	26.50	24.5 - 28.5	.10	
1974	9	6	36.01	33.2 - 38.7	.06	-----
1975	9	0	-----	-----	---	
1974	10	3	34.83	33.6 - 36.4	.04	-----
1975	10	0	-----	-----	---	
1974	11	0	-----	-----	---	-----
1975	11	0	-----	-----	---	
1974	12	1	36.90	-----	.00	-----
1975	12	0	-----	-----	---	

* is significant at .05 level.

TABLE 6. Mean Manus Length of Nestling Mockingbirds

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	33	6.81	6.0 - 8.0	.07	-2.56*
1975	0	55	7.05	6.0 - 7.5	.06	
1974	1	43	7.90	7.0 - 10.0	.08	-0.92
1975	1	52	8.02	7.0 - 9.5	.08	
1974	2	43	9.04	8.0 - 11.0	.10	-2.97*
1975	2	52	9.61	7.5 - 12.0	.10	
1974	3	43	11.11	9.5 - 14.5	.10	-2.36*
1975	3	48	11.70	9.0 - 14.5	.11	
1974	4	39	13.83	12.0 - 17.0	.08	-1.90
1975	4	47	14.42	10.5 - 17.5	.11	
1974	5	34	16.52	13.5 - 19.0	.08	-1.99
1975	5	45	17.30	13.0 - 20.5	.11	
1974	6	32	19.00	13.5 - 23.0	.11	-2.48*
1975	6	37	20.29	15.0 - 23.5	.11	
1974	7	34	20.67	16.0 - 24.5	.09	-4.55*
1975	7	31	22.87	17.5 - 26.0	.09	
1974	8	29	22.43	20.0 - 25.0	.06	-4.07*
1975	8	32	24.12	18.5 - 25.5	.07	
1974	9	25	23.72	20.5 - 26.0	.06	-2.69*
1975	9	30	24.75	20.5 - 26.5	.06	
1974	10	19	24.65	22.5 - 27.0	.06	-2.27*
1975	10	29	25.58	22.0 - 27.5	.05	
1974	11	14	25.60	22.5 - 29.5	.07	-0.69
1975	11	16	26.03	23.5 - 28.5	.06	
1974	12	7	25.64	24.0 - 28.0	.05	+0.37
1975	12	4	25.00	22.5 - 28.0	.09	

* is significant at .05 level.

TABLE 7. Mean Manus Length of Nestling Mockingbirds in April

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	12	6.58	6.00 - 8.00	.09	-1.23
1975	0	14	6.82	6.00 - 7.00	.05	
1974	1	17	8.02	7.00 - 10.00	.10	+0.97
1975	1	11	7.77	7.00 - 8.00	.04	
1974	2	17	8.76	8.00 - 10.00	.09	-1.09
1975	2	14	9.07	7.50 - 10.00	.08	
1974	3	17	10.79	9.50 - 14.50	.11	-0.88
1975	3	14	11.17	9.00 - 13.00	.10	
1974	4	16	13.5	12.00 - 15.50	.08	-1.30
1975	4	14	14.8	12.00 - 15.50	.08	
1974	5	17	16.44	13.50 - 19.00	.08	-1.00
1975	5	14	16.96	14.50 - 19.50	.03	
1974	6	17	19.02	16.00 - 23.00	.08	-2.17*
1975	6	11	20.40	17.50 - 23.50	.09	
1974	7	17	20.52	18.00 - 24.00	.08	-4.14*
1975	7	7	23.21	21.50 - 25.00	.05	
1974	8	16	22.40	21.00 - 25.00	.07	-3.27*
1975	8	10	24.20	22.50 - 26.00	.05	
1974	9	13	24.07	22.50 - 26.00	.04	-0.68
1975	9	14	24.42	22.50 - 26.50	.06	
1974	10	10	24.85	23.00 - 26.50	.04	-1.22
1975	10	14	25.46	23.50 - 27.50	.05	
1974	11	8	25.56	24.50 - 29.50	.06	-0.34
1975	11	10	25.80	23.50 - 27.50	.05	
1974	12	1	25.00	-----	.00	-----
1975	12	2	25.25	25.00 - 25.50	.01	

* is significant at .05 level.

TABLE 8. Mean Manus Length of Nestling Mockingbirds in May

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	4	6.50	6.0 - 7.0	.06	-3.67*
1975	0	12	7.25	6.5 - 7.5	.04	
1974	1	6	7.58	7.0 - 8.5	.09	-3.20*
1975	1	12	8.62	7.5 - 9.5	.07	
1974	2	6	8.75	8.0 - 10.0	.09	-4.32*
1975	2	13	10.46	9.5 - 11.5	.06	
1974	3	6	11.16	9.5 - 12.5	.10	-4.50*
1975	3	13	13.19	11.5 - 14.5	.06	
1974	4	6	14.00	12.0 - 17.0	.12	-4.30*
1975	4	13	16.34	15.0 - 17.5	.05	
1974	5	5	15.40	13.5 - 17.5	.10	-6.99*
1975	5	13	19.19	18.0 - 20.5	.04	
1974	6	4	16.12	13.5 - 21.5	.22	-4.76*
1975	6	12	21.79	20.0 - 23.0	.05	
1974	7	6	19.58	16.0 - 24.5	.15	-5.14*
1975	7	12	24.16	23.0 - 26.0	.05	
1974	8	6	22.16	20.0 - 24.0	.08	-5.03*
1975	8	11	25.22	24.0 - 26.0	.03	
1974	9	6	22.91	20.5 - 25.0	.08	-4.06*
1975	9	9	25.72	25.0 - 27.0	.03	
1974	10	6	24.75	22.5 - 27.0	.08	-1.89
1975	10	8	26.31	25.0 - 27.0	.07	
1974	11	6	25.66	23.0 - 28.0	.08	-1.50
1975	11	5	27.20	26.0 - 28.5	.05	
1974	12	5	25.9	24.0 - 28.0	.06	-----
1975	12	1	28.0	-----	.00	

* is significant at .05 level.

TABLE 9. Mean Manus Length of Nestling Mockingbirds in June

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	13	7.07	7.0 - 7.5	.02	+0.87
1975	0	12	6.95	6.0 - 7.5	.06	
1974	1	18	7.86	7.0 - 8.5	.11	+0.36
1975	1	15	7.80	7.0 - 8.5	.12	
1974	2	15	9.40	8.0 - 11.0	.10	-0.26
1975	2	13	9.50	8.0 - 12.0	.10	
1974	3	13	11.30	10.0 - 13.0	.08	+0.04
1975	3	8	11.12	9.5 - 12.0	.07	
1974	4	10	14.00	12.5 - 16.0	.06	+0.22
1975	4	10	13.90	12.5 - 15.5	.07	
1974	5	5	16.80	16.0 - 18.0	.05	-0.24
1975	5	10	17.00	14.0 - 19.0	.09	
1974	6	4	19.87	18.5 - 21.0	.06	-0.21
1975	6	10	20.10	15.5 - 22.0	.09	
1974	7	4	22.00	21.0 - 23.0	.04	-0.11
1975	7	10	22.10	18.5 - 24.0	.07	
1974	8	1	22.50	-----	.00	-----
1975	8	9	23.61	20.5 - 26.5	.07	
1974	9	0	-----	-----	---	-----
1975	9	7	24.14	21.0 - 25.5	.06	
1974	10	0	-----	-----	---	-----
1975	10	7	25.00	22.0 - 27.0	.06	
1974	11	0	-----	-----	---	-----
1975	11	1	22.50	-----	.00	
1974	12	0	-----	-----	---	-----
1975	12	1	22.50	-----	.00	

* is significant at .05 level.

TABLE 10. Mean Manus Length of Nestling Mockingbirds in July

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	4	7.00	7.0 - 7.0	.00	-1.13
1975	0	17	7.17	6.5 - 7.5	.04	
1974	1	4	7.62	7.5 - 8.0	.03	-0.91
1975	1	14	7.96	7.0 - 9.0	.08	
1974	2	5	9.30	8.5 - 10.0	.07	-0.33
1975	2	12	9.45	8.0 - 11.0	.09	
1974	3	7	11.50	10.5 - 12.5	.05	+0.91
1975	3	13	11.15	9.5 - 12.5	.07	
1974	4	7	14.21	13.0 - 16.0	.08	+2.06
1974	4	10	13.00	10.5 - 15.0	.09	
1974	5	7	17.35	16.0 - 19.0	.05	+3.39*
1975	5	8	15.18	13.0 - 17.0	.09	
1974	6	7	19.78	18.0 - 21.5	.06	+4.68*
1975	6	4	16.00	15.0 - 17.5	.06	
1974	7	7	21.21	18.0 - 23.5	.08	+2.72*
1975	7	2	17.75	17.5 - 18.0	.01	
1974	8	6	22.75	21.0 - 24.0	.04	+2.56*
1975	8	2	20.00	18.5 - 21.5	.10	
1974	9	6	23.75	22.5 - 25.5	.04	-----
1975	9	0	-----	-----	-----	
1974	10	3	23.83	22.5 - 25.0	.05	-----
1975	10	0	-----	-----	-----	
1974	11	0	-----	-----	-----	-----
1975	11	0	-----	-----	-----	
1974	12	1	25.00	-----	.00	-----
1975	12	0	-----	-----	-----	

* is significant at .05 level.

TABLE 11. Mean Culmen Length of Nestling Mockingbirds

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	34	2.50	2.0 - 3.0	.13	-4.22*
1975	0	54	2.80	2.0 - 3.0	.10	
1974	1	40	2.95	2.0 - 3.5	.13	-2.84*
1975	1	53	3.13	2.5 - 3.5	.08	
1974	2	41	3.52	3.0 - 4.5	.11	-1.53
1975	2	51	3.64	3.0 - 4.5	.10	
1974	3	43	4.06	3.0 - 5.0	.09	-1.20
1975	3	48	4.15	3.5 - 5.0	.07	
1974	4	38	4.63	4.0 - 5.5	.09	-0.42
1975	4	50	4.66	4.0 - 5.0	.07	
1974	5	34	5.02	4.0 - 6.0	.08	-2.19*
1975	5	45	5.21	4.5 - 6.0	.07	
1974	6	32	5.53	4.5 - 6.5	.10	-1.61
1975	6	38	5.72	4.5 - 6.5	.08	
1974	7	31	5.93	5.0 - 7.0	.09	-1.60
1975	7	31	6.14	5.0 - 7.0	.08	
1974	8	28	6.35	5.5 - 7.0	.07	-1.68
1975	8	32	6.56	5.5 - 7.5	.08	
1974	9	22	6.84	6.0 - 8.0	.07	-1.13
1975	9	30	6.98	6.0 - 7.5	.06	
1974	10	17	7.05	6.0 - 7.5	.06	-1.67
1975	10	29	7.31	6.5 - 8.0	.07	
1974	11	14	7.32	6.0 - 8.0	.08	-1.88
1975	11	16	7.71	6.0 - 8.5	.07	
1974	12	5	7.70	7.5 - 8.0	.06	+0.18
1975	12	4	7.62	6.5 - 8.0	.09	

* is significant at .05 level.

TABLE 12. Mean Culmen Length of Nestling Mockingbirds in April

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	11	2.27	2.0 - 3.0	.15	-3.24*
1975	0	14	2.75	2.0 - 3.0	.13	
1974	1	12	2.62	2.0 - 3.5	.16	-2.76*
1975	1	11	3.04	2.5 - 3.5	.09	
1974	2	15	3.43	3.0 - 4.0	.12	-1.57
1975	2	14	3.67	3.0 - 4.5	.11	
1974	3	17	4.05	3.0 - 5.0	.12	-0.78
1975	3	14	4.17	3.5 - 4.5	.07	
1974	4	15	4.56	4.0 - 5.0	.08	-0.55
1975	4	14	4.64	4.0 - 5.0	.08	
1974	5	17	5.05	4.5 - 5.5	.07	-1.73
1975	5	14	5.28	5.0 - 6.0	.07	
1974	6	17	5.38	4.5 - 6.5	.09	-2.40*
1975	6	12	5.79	5.0 - 6.5	.07	
1974	7	16	5.81	5.0 - 6.0	.05	-3.29*
1975	7	7	6.35	6.0 - 7.0	.07	
1974	8	15	6.34	6.0 - 7.0	.06	-3.53*
1975	8	10	6.80	6.5 - 7.0	.04	
1974	9	14	6.85	6.0 - 7.0	.05	-2.51*
1975	9	9	7.14	7.0 - 7.5	.03	
1974	10	14	7.16	7.0 - 7.5	.03	-2.13*
1975	10	8	7.46	7.0 - 8.0	.05	
1974	11	8	7.62	7.0 - 8.0	.05	-1.05
1975	11	10	7.80	7.5 - 8.5	.04	
1974	12	1	8.00	-----	.00	-----
1975	12	2	8.00	8.0 - 8.0	.00	

* is significant at .05 level.

TABLE 13. Mean Culmen Length of Nestling Mockingbirds in May

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	4	2.62	2.5 - 3.0	.10	-1.46
1975	0	12	2.83	2.5 - 3.0	.08	
1974	1	6	3.08	3.0 - 3.5	.06	-0.92
1975	1	13	3.19	3.0 - 3.5	.08	
1974	2	6	3.41	3.0 - 4.0	.11	-3.03*
1975	2	13	3.84	3.5 - 4.0	.06	
1974	3	6	3.83	3.5 - 4.0	.07	-2.84*
1975	3	13	4.26	4.0 - 5.0	.08	
1974	4	6	4.25	4.0 - 4.5	.06	-4.82*
1975	4	13	4.84	4.5 - 5.0	.05	
1974	5		4.60	4.0 - 5.0	.09	-5.90*
1975	5	13	5.42	5.0 - 5.5	.03	
1974	6	4	5.12	5.0 - 5.5	.05	-6.51*
1975	6	11	6.00	5.5 - 6.5	.04	
1974	7	4	5.37	5.0 - 6.0	.09	-6.42*
1975	7	12	6.41	6.0 - 6.5	.03	
1974	8	5	5.90	5.5 - 6.5	.07	-5.51*
1975	8	11	6.90	6.5 - 7.5	.04	
1974	9	6	6.50	6.0 - 7.0	.08	-3.22*
1975	9	9	7.16	7.0 - 7.5	.03	
1974	10	5	6.60	6.0 - 7.0	.06	-4.75*
1975	10	8	7.62	7.0 - 8.0	.05	
1974	11	6	6.91	6.0 - 7.5	.10	-3.13*
1975	11	5	7.90	7.5 - 8.0	.03	
1974	12	1	8.00	-----	-----	-----
1975	12	1	8.00	-----	-----	

* is significant at .05 level.

TABLE 14. Mean Culmen Length of Nestling Mockingbirds in June

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	15	2.63	2.5 - 3.0	.08	-0.97
1975	0	11	2.72	2.5 - 3.0	.09	
1974	1	18	3.08	2.5 - 3.5	.08	+0.68
1975	1	15	3.03	3.0 - 3.5	.03	
1974	2	15	3.63	3.0 - 4.5	.10	+1.46
1975	2	12	3.41	3.0 - 4.0	.10	
1974	3	13	4.11	4.0 - 4.5	.05	+0.57
1975	3	8	4.06	4.0 - 4.5	.04	
1974	4	10	4.75	4.0 - 5.0	.08	+0.64
1975	4	10	4.65	4.5 - 5.0	.05	
1974	5	5	5.00	5.0 - 5.0	.00	-1.33
1975	5	10	5.15	5.0 - 5.5	.04	
1974	6	4	5.87	6.0 - 6.5	.10	+0.73
1975	6	10	5.65	5.0 - 6.5	.08	
1974	7	4	6.62	6.0 - 7.0	.08	+3.05*
1975	7	10	5.85	5.5 - 6.5	.07	
1974	8	1	6.50	-----	.00	-----
1975	8	9	6.11	6.0 - 6.5	.03	
1974	9	0	-----	-----	.00	-----
1975	9	7	6.42	6.0 - 7.0	.05	-----
1974	10	0	-----	-----	-----	-----
1975	10	7	6.64	6.0 - 7.0	.05	
1974	11	0	-----	-----	-----	-----
1975	11	1	6.00	-----	.00	
1974	12	0	-----	-----	-----	-----
1975	12	1	6.50	-----	.00	

* is significant at .05 level

TABLE 15. Mean Culmen Length of Nestling Mockingbirds in July

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	4	2.75	2.5 - 3.0	.10	-1.03
1975	0	17	2.88	2.5 - 3.0	.07	
1974	1	4	3.12	3.0 - 3.5	.08	-0.85
1975	1	14	3.25	3.0 - 3.5	.07	
1974	2	5	3.60	3.0 - 4.0	.11	-0.13
1975	2	12	3.62	3.0 - 4.0	.08	
1974	3	7	4.21	4.0 - 5.0	.09	+0.91
1975	3	13	4.07	3.5 - 4.5	.06	
1974	4	7	4.92	4.0 - 5.5	.08	+2.40*
1975	4	10	4.45	4.0 - 5.0	.08	
1974	5	7	5.28	5.0 - 6.0	.07	+2.78*
1975	5	8	4.81	4.5 - 5.0	.05	
1974	6	7	5.78	5.0 - 6.5	.09	+2.28*
1975	6	5	5.10	4.5 - 5.5	.08	
1974	7	7	6.14	5.0 - 7.0	.10	+1.87
1975	7	2	5.25	5.0 - 5.5	.06	
1974	8	6	6.75	6.5 - 7.0	.04	+6.12*
1975	8	2	5.50	5.5 - 5.5	.00	
1974	9	6	7.16	6.5 - 8.0	.07	-----
1975	9	0	-----	-----	-----	
1974	10	3	7.50	7.5 - 7.5	.00	-----
1975	10	0	-----	-----	-----	
1974	11	0	-----	-----	-----	-----
1975	11	0	-----	-----	-----	
1974	12	1	7.50	-----	.00	-----
1975	12	0	-----	-----	-----	

* is significant at .05 level.

TABLE 16. Mean Gape Width of Nestling Mockingbirds

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	34	11.22	9.5 - 12.5	.07	-1.61
1975	0	53	11.52	9.5 - 13.5	.08	
1974	1	43	13.23	11.0 - 15.0	.05	-1.11
1975	1	52	13.44	11.0 - 15.0	.08	
1974	2	42	15.02	13.5 - 16.5	.05	-0.97
1975	2	52	15.20	13.0 - 17.0	.07	
1974	3	43	16.74	15.0 - 19.0	.05	-0.50
1975	3	48	16.84	14.5 - 19.5	.06	
1974	4	36	18.06	16.0 - 20.5	.05	-0.39
1975	4	47	18.15	16.0 - 21.0	.06	
1974	5	35	18.61	17.0 - 20.0	.05	-1.63
1975	5	45	18.92	17.0 - 20.0	.04	
1974	6	34	19.27	17.5 - 21.0	.04	+0.04
1975	6	39	19.26	17.0 - 21.0	.05	
1974	7	33	19.30	17.5 - 21.5	.05	-0.82
1975	7	31	19.46	18.0 - 20.5	.03	
1974	8	29	19.39	18.0 - 21.0	.04	+1.19
1975	8	32	19.18	18.0 - 20.0	.03	
1974	9	25	19.10	18.0 - 20.5	.04	+3.72*
1975	9	30	18.33	17.0 - 20.0	.04	
1974	10	18	18.69	18.0 - 20.0	.03	+3.10*
1974	10	29	18.01	15.5 - 19.5	.04	
1974	11	14	18.39	17.0 - 19.5	.04	+2.85*
1975	11	16	17.75	16.5 - 18.5	.03	
1974	12	5	17.90	17.0 - 18.5	.03	+2.16
1975	12	4	17.00	16.0 - 17.5	.04	

* is significant at .05 level.

TABLE 17. Mean Gape Width of Nestling Mockingbirds in April

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	11	11.00	10.0 - 12.0	.06	-0.72
1975	0	14	11.28	9.5 - 13.5	.10	
1974	1	15	13.06	11.0 - 14.0	.07	-1.31
1975	1	11	13.54	12.0 - 15.0	.07	
1974	2	16	15.09	14.0 - 16.0	.05	-0.24
1974	2	14	15.17	13.0 - 17.0	.08	
1974	3	17	16.67	15.0 - 18.0	.04	-0.00
1975	3	14	16.67	14.5 - 19.5	.07	
1974	4	13	18.07	17.0 - 19.5	.06	+0.29
1975	4	14	17.96	16.0 - 20.0	.06	
1974	5	17	18.67	17.0 - 20.0	.04	-1.12
1975	5	14	19.00	18.0 - 20.0	.04	
1974	6	17	19.29	17.5 - 21.0	.04	-0.37
1975	6	12	19.41	18.0 - 20.5	.04	
1974	7	17	19.55	17.5 - 21.5	.05	-0.37
1975	7	7	19.71	19.0 - 20.5	.03	
1974	8	16	19.40	18.0 - 21.0	.05	+0.32
1975	8	10	19.30	18.0 - 20.0	.03	
1974	9	13	19.11	18.0 - 20.5	.04	+2.25*
1975	9	14	18.50	18.0 - 20.0	.04	
1974	10	9	18.72	18.0 - 19.5	.03	+1.53
1975	10	14	18.32	17.0 - 19.5	.04	
1974	11	8	18.75	18.0 - 19.5	.02	+4.15*
1975	11	10	17.75	16.5 - 18.5	.03	
1974	12	1	18.00	-----	.00	-----
1975	12	2	16.75	16.0 - 17.5	.06	

* is significant at .05 level.

TABLE 18. Mean Gape Width of Nestling Mockingbirds in May

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	4	11.00	9.5 - 12.5	.13	-1.91
1975	0	12	12.08	11.0 - 13.0	.07	
1974	1	6	13.08	12.0 - 14.0	.06	-2.75*
1975	1	12	14.16	13.0 - 15.0	.05	
1974	2	6	14.75	13.5 - 16.0	.06	-1.83
1975	2	13	15.61	14.5 - 17.0	.06	
1974	3	6	16.75	15.0 - 18.5	.08	-0.99
1975	3	13	17.75	15.5 - 18.0	.05	
1974	4	6	18.25	17.0 - 19.0	.04	-0.33
1975	4	13	18.38	17.5 - 20.0	.04	
1974	5	6	19.00	18.0 - 20.0	.04	-0.54
1975	5	13	19.19	18.0 - 20.0	.04	
1974	6	6	18.75	18.0 - 19.0	.03	-1.10
1975	6	12	19.20	18.0 - 21.0	.05	
1974	7	6	18.75	18.0 - 20.5	.05	-1.90
1975	7	12	19.54	18.5 - 20.5	.04	
1974	8	6	19.25	18.5 - 20.0	.03	+0.19
1975	8	11	19.18	18.0 - 20.0	.04	
1974	9	6	19.33	18.5 - 20.0	.03	+2.01
1975	9	9	18.27	17.0 - 20.0	.06	
1974	10	6	18.83	18.0 - 20.0	.04	+2.57*
1975	10	8	17.56	15.5 - 19.0	.06	
1974	11	6	17.91	17.0 - 19.0	.04	+0.28
1975	11	5	17.80	17.0 - 18.5	.04	
1974	12	3	17.83	17.0 - 18.5	.04	-----
1975	12	1	17.50	-----	.00	

* is significant at .05 level.

TABLE 19. Mean Gape Width of Nestling Mockingbirds in June

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	15	11.46	10.5 - 12.5	.06	+0.20
1975	0	11	11.40	10.0 - 12.5	.05	
1974	1	18	13.36	12.5 - 14.5	.03	+1.73
1975	1	15	12.96	11.0 - 14.0	.06	
1974	2	15	14.46	14.0 - 16.5	.05	+0.38
1975	2	13	14.84	13.0 - 16.5	.05	
1974	3	13	16.57	15.5 - 19.0	.06	-0.24
1975	3	8	16.68	15.5 - 18.0	.05	
1974	4	10	17.70	16.0 - 18.5	.04	-1.48
1975	4	10	18.20	17.0 - 19.5	.04	
1974	5	5	17.70	17.0 - 19.0	.04	-2.99*
1975	5	10	18.80	18.0 - 20.0	.03	
1974	6	4	19.50	19.0 - 20.0	.02	+0.49
1975	6	10	19.25	17.5 - 20.5	.04	
1974	7	4	19.25	19.0 - 20.0	.02	+0.26
1975	7	10	19.15	18.0 - 20.0	.03	
1974	8	1	19.00	-----	.00	-----
1975	8	9	18.88	18.5 - 19.5	.02	
1974	9	0	-----	-----	-----	-----
1975	9	7	18.00	17.5 - 18.5	.01	
1974	10	0	-----	-----	-----	-----
1975	10	7	17.92	17.5 - 19.0	.02	
1974	11	0	-----	-----	-----	-----
1975	11	1	17.5	-----	.00	
1974	12	0	-----	-----	-----	-----
1975	12	1	17.0	-----	.00	

* is significant at .05 level.

TABLE 20. Mean Gape Width of Nestling Mockingbirds in July

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	4	11.12	10.0 - 12.0	.07	-0.66
1975	0	16	11.40	10.0 - 12.5	.06	
1974	1	4	13.50	13.0 - 15.0	.07	+0.27
1975	1	14	13.32	11.0 - 15.0	.08	
1974	2	5	15.30	14.0 - 16.5	.06	+0.34
1975	2	12	15.12	14.0 - 17.0	.06	
1974	3	7	17.21	16.5 - 18.0	.02	+1.25
1975	3	13	16.73	15.5 - 18.5	.05	
1974	4	7	18.42	17.0 - 20.5	.06	+0.43
1975	4	10	18.10	16.0 - 21.0	.09	
1974	5	7	18.78	18.0 - 19.5	.03	+1.02
1975	5	8	18.31	17.0 - 20.0	.05	
1974	6	7	19.57	18.0 - 21.0	.04	+0.67
1975	6	5	19.10	17.0 - 20.5	.07	
1974	7	6	19.16	19.0 - 20.0	.02	-1.98
1975	7	2	19.75	19.5 - 20.0	.01	
1974	8	6	19.58	19.0 - 20.0	.01	-1.48
1975	8	2	20.00	20.0 - 20.0	.00	
1974	9	6	18.83	18.0 - 20.0	.03	-----
1975	9	0	-----	-----	-----	
1974	10	3	18.33	18.0 - 19.0	.03	-----
1975	10	0	-----	-----	-----	
1974	11	0	-----	-----	-----	-----
1975	11	0	-----	-----	-----	
1974	12	1	18.0	-----	.00	-----
1975	12	0	-----	-----	-----	

* is significant at .05 level.

TABLE 21. Mean Eighth Primary Length of Nestling Mockingbirds

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	-----	-----	-----	-----	-----
1975	0	-----	-----	-----	-----	-----
1974	1	-----	-----	-----	-----	-----
1975	1	-----	-----	-----	-----	-----
1974	2	-----	-----	-----	-----	-----
1975	2	-----	-----	-----	-----	-----
1974	3	-----	-----	-----	-----	-----
1975	3	-----	-----	-----	-----	-----
1974	4	38	2.77	1.0 - 4.0	.29	-2.50*
1975	4	47	3.39	1.0 - 6.5	.40	
1974	5	34	5.29	2.5 - 8.0	.26	-2.79*
1975	5	45	6.36	2.5 - 10.0	.29	
1974	6	33	8.65	3.5 - 11.5	.24	-2.96*
1975	6	39	10.34	4.5 - 14.5	.26	
1974	7	34	12.55	4.5 - 17.0	.24	-3.12*
1975	7	31	15.08	7.0 - 21.5	.23	
1974	8	28	16.94	9.0 - 21.0	.18	-2.44*
1975	8	32	19.14	9.5 - 25.0	.20	
1974	9	25	20.96	11.5 - 25.0	.17	-2.92*
1975	9	30	23.63	14.5 - 28.5	.13	
1974	10	19	24.30	14.0 - 29.5	.18	-2.53*
1975	10	29	27.24	15.0 - 31.5	.13	
1974	11	14	27.17	15.5 - 33.0	.18	-0.02
1975	11	16	30.75	17.5 - 35.0	.13	
1974	12	7	29.14	20.0 - 36.9	.22	-0.01
1975	12	4	29.25	19.0 - 34.0	.24	

* is significant at .05 level.

TABLE 22. Mean Eighth Primary Length of Nestling Mockingbirds in April

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	-----	-----	-----	-----	-----
1975	0	-----	-----	-----	-----	
1974	1	-----	-----	-----	-----	-----
1975	1	-----	-----	-----	-----	
1974	2	-----	-----	-----	-----	-----
1975	2	-----	-----	-----	-----	
1974	3	-----	-----	-----	-----	-----
1975	3	-----	-----	-----	-----	
1974	4	17	2.58	2.0 - 4.0	.27	-1.90
1975	4	14	3.17	1.5 - 4.5	.32	
1974	5	17	5.20	4.0 - 6.5	.16	-2.35*
1975	5	14	6.28	3.5 - 8.5	.27	
1974	6	16	8.65	6.5 - 11.0	.15	-3.11*
1975	6	12	10.50	7.0 - 13.5	.18	
1974	7	17	12.88	9.5 - 17.0	.15	-2.80*
1975	7	7	15.35	12.5 - 18.0	.12	
1974	8	15	17.00	13.5 - 21.0	.12	-3.18*
1975	8	10	19.65	16.5 - 22.5	.10	
1974	9	13	21.61	18.5 - 24.0	.09	-2.54*
1975	9	14	23.64	19.5 - 27.0	.09	
1974	10		25.25	23.0 - 28.0	.06	-2.85*
1975	10	14	27.46	24.5 - 30.5	.07	
1974	11	8	28.56	26.0 - 31.0	.08	+2.58*
1975	11	10	30.95	28.5 - 33.5	.05	
1974	12	1	35.0	-----	.00	-----
1975	12	2	32.0	31.0 - 33.0	.04	

* is significant at .05 level.

TABLE 23. Mean Eighth Primary Length of Nestling Mockingbirds in May

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	-----	-----	-----	-----	-----
1975	0	-----	-----	-----	-----	
1974	1	-----	-----	-----	-----	-----
1975	1	-----	-----	-----	-----	
1974	2	-----	-----	-----	-----	-----
1975	2	-----	-----	-----	-----	
1974	3	-----	-----	-----	-----	-----
1975	3	-----	-----	-----	-----	
1974	4	6	2.25	1.0 - 4.0	.48	-5.31*
1975	4	13	4.76	3.0 - 6.5	.19	
1974	5	6	4.08	2.5 - 6.0	.36	-6.79*
1975	5	13	8.30	7.0 - 10.0	.14	
1974	6	6	6.41	3.5 - 10.0	.41	-7.49*
1975	6	12	12.91	10.5 - 14.5	.09	
1974	7	6	10.16	4.5 - 14.0	.48	-5.23*
1975	7	12	18.04	15.0 - 21.5	.09	
1974	8	6	15.00	9.0 - 20.5	.34	-3.78*
1975	8	11	22.13	17.5 - 25.0	.09	
1974	9	6	18.33	11.5 - 24.5	.32	-4.10*
1975	9	9	26.33	24.0 - 28.5	.08	
1974	10	6	21.75	14.0 - 29.5	.30	-3.42*
1975	10	8	30.06	26.0 - 31.5	.07	
1974	11	6	25.33	15.5 - 33.0	.27	-2.34*
1975	11	5	33.00	29.5 - 35.0	.07	
1974	12	5	33.80	20.0 - 35.0		-----
1975	12	1	34.00	34.0	-----	

* is significant at .05 level.

TABLE 24. Mean Eighth Primary Length of Nestling Mockingbirds in June

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	-----	-----	-----	-----	-----
1975	0	-----	-----	-----	-----	
1974	1	-----	-----	-----	-----	-----
1975	1	-----	-----	-----	-----	
1974	2	-----	-----	-----	-----	-----
1975	2	-----	-----	-----	-----	
1974	3	-----	-----	-----	-----	-----
1975	3	-----	-----	-----	-----	
1974	4	9	3.16	2.5 - 4.0	.15	+0.96
1975	4	10	2.80	2.0 - 5.5	.36	
1974	5	5	5.90	4.0 - 7.5	.26	+0.79
1975	5	10	5.40	3.5 - 6.5	.16	
1974	6	4	10.25	8.0 - 11.5	.15	+1.22
1975	6	10	9.05	5.5 - 10.5	.18	
1974	7	4	12.75	12.0 - 14.0	.07	-0.19
1975	7	10	12.95	8.5 - 14.5	.14	
1974	8	1	19.00	-----	.00	-----
1975	8	9	17.00	11.5 - 20.0	.14	
1974	9	0	-----	-----	.00	-----
1975	9	7	20.14	14.5 - 22.0	.13	
1974	10	0	-----	-----	.00	-----
1975	10	7	23.57	15.0 - 26.0	.16	
1974	11	0	-----	-----	-----	-----
1975	11	1	17.50	-----	.00	
1974	12	0	-----	-----	-----	-----
1975	12	1	19.00	-----	.00	

* is significant at .05 level.

TABLE 25. Mean Eighth Primary Length of Nestling Mockingbirds in July

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	-----	-----	-----	-----	-----
1975	0	-----	-----	-----	-----	
1974	1	-----	-----	-----	-----	-----
1975	1	-----	-----	-----	-----	
1974	2	-----	-----	-----	-----	-----
1975	2	-----	-----	-----	-----	
1974	3	-----	-----	-----	-----	-----
1975	3	-----	-----	-----	-----	
1974	4	6	3.25	2.0 - 4.0	.23	+1.36
1975	4	10	2.50	1.0 - 4.5	.48	
1974	5	6	6.25	3.5 - 8.0	.26	+2.02
1975	5	8	4.56	2.5 - 6.5	.32	
1974	6	7	9.64	5.5 - 11.5	.20	+2.65*
1975	6	5	6.40	4.5 - 9.0	.34	
1974	7	7	13.71	6.5 - 16.0	.25	+2.63*
1975	7	2	7.00	7.0 - 7.0	.00	
1974	8	6	18.41	16.0 - 20.5	.11	+5.44*
1975	8	2	9.75	9.5 - 10.0	.03	
1974	9	6	22.16	18.5 - 25.0	.12	-----
1975	9	0	-----	-----	-----	
1974	10	3	26.46	21.5 - 29.0	.01	-----
1975	10	0	-----	-----	-----	
1974	11	0	-----	-----	-----	-----
1975	11	0	-----	-----	-----	
1974	12	1	36.90	-----	.00	-----
1975	12	0	-----	-----	-----	

* is significant at .05 level.

TABLE 26. Mean Weights of Nestling Brown Thrashers

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	28	5.50	3.4 - 6.5	.14	+1.58
1975	0	36	5.21	3.6 - 6.5	.11	
1974	1	33	7.94	5.3 - 11.0	.16	+1.00
1975	1	45	7.67	4.7 - 10.3	.14	
1974	2	34	12.02	7.9 - 15.3	.15	+3.04*
1975	2	42	10.88	7.8 - 14.1	.13	
1974	3	32	16.90	10.7 - 20.5	.16	+2.94*
1975	3	33	15.10	9.6 - 19.0	.15	
1974	4	27	21.74	13.7 - 28.1	.15	+1.47
1975	4	34	20.37	7.9 - 26.1	.18	
1974	5	28	27.03	18.0 - 32.5	.12	+1.86
1975	5	32	25.33	13.2 - 32.8	.15	
1974	6	21	31.69	19.2 - 37.9	.15	+1.52
1975	6	26	29.39	10.9 - 37.1	.19	
1974	7	18	36.52	29.8 - 40.6	.09	+2.17*
1975	7	21	33.18	17.7 - 42.2	.18	
1974	8	17	38.31	28.0 - 43.0	.10	+1.03
1975	8	13	36.42	22.8 - 41.7	.17	
1974	9	13	40.49	34.5 - 44.1	.06	+0.35
1975	9	9	39.84	27.6 - 43.9	.15	
1974	10	10	42.52	36.6 - 45.9	.07	+0.68
1975	10	8	40.86	27.8 - 46.3	.17	
1974	11	7	43.77	41.3 - 45.6	.03	+1.76
1975	11	3	38.86	30.1 - 43.9	.20	
1974	12	3	40.96	40.4 - 41.5	.01	-----
1975	12	1	46.00	-----	.00	

* is significant at .05 level.

TABLE 27. Mean Weights of Nestling Brown Thrashers in April

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	6	4.76	3.4 - 6.5	.22	-1.46
1975	0	7	5.37	5.0 - 5.6	.03	
1974	1	9	7.38	5.3 - 9.2	.17	-0.85
1975	1	8	7.83	6.8 - 9.1	.10	
1974	2	8	11.08	7.9 - 13.5	.17	-0.22
1975	2	6	11.28	10.0 - 12.5	.07	
1974	3	7	14.91	11.1 - 18.4	.18	-0.63
1975	3	4	15.90	13.6 - 17.2	.03	
1974	4	5	19.40	15.5 - 22.7	.14	-1.52
1975	4	4	21.97	19.4 - 23.8	.08	
1974	5	7	27.12	22.4 - 31.6	.11	-0.42
1975	5	3	27.96	26.4 - 30.2	.07	
1974	6	7	31.67	26.2 - 34.7	.10	-1.21
1975	6	2	34.65	34.0 - 35.3	.02	
1974	7	6	35.31	29.8 - 38.7	.09	-1.15
1975	7	3	37.73	36.6 - 39.2	.03	
1974	8	4	39.67	37.0 - 43.0	.07	-0.66
1975	8	4	40.67	40.0 - 41.7	.02	
1974	9	3	42.36	40.3 - 44.1	.02	-0.39
1975	9	4	42.75	42.1 - 43.3	.01	
1974	10	4	43.55	40.6 - 45.9	.05	-0.44
1975	10	3	44.40	41.2 - 46.3	.06	
1974	11	4	44.12	41.3 - 45.6	.05	-----
1975	11	0	-----	-----	-----	
1974	12	3	40.96	40.4 - 41.5	.01	-----
1975	12	0	-----	-----	-----	

* is significant at .05 level.

TABLE 28. Mean Weights of Nestling Brown Thrashers in May

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	5	5.68	4.8 - 6.1	.10	+0.36
1975	0	5	5.48	3.6 - 6.4	.20	
1974	1	7	8.28	6.7 - 11.0	.19	+0.70
1975	1	6	7.68	6.1 - 9.3	.19	
1974	2	7	11.65	9.5 - 13.7	.16	+0.85
1975	2	6	10.80	8.6 - 12.6	.16	
1974	3	6	15.41	10.7 - 19.5	.21	-0.07
1975	3	6	15.53	13.2 - 18.6	.16	
1974	4	5	20.38	13.7 - 26.4	.26	+0.02
1975	4	5	20.32	17.7 - 23.9	.14	
1974	5	5	25.04	18.0 - 30.6	.22	+0.06
1975	5	5	24.88	21.9 - 26.7	.09	
1974	6	5	29.18	19.2 - 37.9	.27	-0.10
1975	6	3	29.70	27.7 - 31.4	.06	
1974	7	3	37.80	35.6 - 40.4	.06	+1.81
1975	7	3	34.53	32.7 - 36.6	.06	
1974	8	3	38.83	37.6 - 40.8	.04	-0.16
1975	8	3	39.06	37.1 - 40.1	.04	
1974	9	5	40.22	39.2 - 42.1	.03	-0.31
1975	9	2	42.35	41.8 - 42.9	.02	
1974	10	4	43.00	39.8 - 45.5	.06	-0.35
1975	10	2	43.65	43.5 - 43.8	.01	
1974	11	3	43.30	42.9 - 43.6	.01	+0.09
1975	11	2	43.25	42.6 - 43.9	.02	
1974	12	0	-----	-----	-----	-----
1975	12	1	46.00	-----	.00	

* is significant at .05 level.

TABLE 29. Mean Weights of Nestling Brown Thrashers in June

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	14	5.66	4.7 - 6.4	.10	+2.07*
1975	0	13	5.20	4.1 - 6.4	.12	
1974	1	11	8.35	6.6 - 10.3	.16	+1.42
1975	1	20	7.75	6.4 - 10.3	.13	
1974	2	13	13.10	10.3 - 15.3	.13	+3.91*
1975	2	19	10.91	7.8 - 13.3	.14	
1974	3	14	18.40	15.8 - 20.5	.08	+4.70*
1975	3	15	14.83	9.6 - 19.0	.16	
1974	4	13	23.35	20.3 - 28.1	.10	+2.21*
1975	4	17	20.34	7.9 - 25.9	.22	
1974	5	12	27.89	23.0 - 32.5	.09	+1.24
1975	5	16	26.39	21.0 - 32.8	.13	
1974	6	9	33.11	28.4 - 36.0	.08	+1.93
1975	6	12	29.52	19.9 - 37.1	.17	
1974	7	9	36.90	30.5 - 40.6	.09	+1.70
1975	7	7	32.04	17.7 - 42.2	.24	
1974	8	10	39.64	28.0 - 41.8	.12	-----
1975	8	1	26.60	-----	.00	
1974	9	5	39.64	34.5 - 42.1	.09	-----
1975	9	1	27.60	-----	.00	
1974	10	2	39.5	36.6 - 42.4	.10	-----
1975	10	1	27.8	-----	.00	
1974	11	0	-----	-----	-----	-----
1975	11	1	30.1	-----	.00	

* is significant at .05 level.

TABLE 30. Mean Weights of Nestling Brown Thrashers in July

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	3	5.90	5.6 - 6.3	.06	+1.97
1975	0	11	5.01	4.1 - 6.5	.15	
1974	1	6	7.63	6.7 - 8.8	.11	+0.39
1975	1	11	7.41	4.7 - 9.4	.16	
1974	2	6	11.35	10.1 - 12.8	.10	+0.99
1975	2	11	10.64	7.9 - 14.1	.14	
1974	3	5	17.28	14.3 - 19.5	.12	+1.89
1975	3	8	14.90	10.9 - 18.9	.15	
1974	4	4	21.12	17.9 - 23.5	.11	+0.71
1975	4	8	19.67	12.7 - 26.1	.18	
1974	5	4	26.82	25.4 - 28.4	.05	+1.96
1975	5	8	22.51	13.2 - 26.1	.19	
1974	6	0	-----	-----	-----	-----
1975	6	9	27.94	10.9 - 36.5	.26	
1974	7	0	-----	-----	-----	-----
1975	7	8	31.97	23.9 - 41.3	.17	
1974	8	0	-----	-----	-----	-----
1975	8	5	33.40	22.8 - 41.3	.22	
1974	9	0	-----	-----	-----	-----
1975	9	2	37.65	31.4 - 43.9	.23	
1974	10	0	-----	-----	-----	-----
1975	10	2	39.30	32.5 - 46.1	.24	

* is significant at .05 level.

TABLE 31. Mean Manus Length of Nestling Brown Thrashers

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	27	6.90	6.0 - 8.0	.08	-0.28
1975	0	34	6.94	6.5 - 7.5	.05	
1974	1	33	7.87	6.0 - 9.0	.09	+0.57
1975	1	45	7.80	6.5 - 9.0	.06	
1974	2	34	9.41	8.0 - 10.5	.08	+1.00
1975	2	43	9.24	8.0 - 10.5	.08	
1974	3	33	11.39	9.0 - 13.0	.10	+0.71
1975	3	33	11.21	9.5 - 12.5	.08	
1974	4	28	14.23	11.0 - 16.0	.10	+1.73
1975	4	34	13.64	10.5 - 16.5	.09	
1974	5	26	16.86	13.0 - 20.0	.10	+1.26
1975	5	32	16.35	13.0 - 18.0	.08	
1974	6	21	19.42	15.0 - 22.0	.09	+1.26
1975	6	26	18.75	13.0 - 21.5	.10	
1974	7	19	21.42	20.0 - 22.5	.04	+0.74
1975	7	20	21.10	17.0 - 23.5	.08	
1974	8	17	22.64	21.0 - 24.0	.04	-0.13
1975	8	12	22.70	19.0 - 24.0	.07	
1974	9	12	23.62	23.0 - 24.5	.02	+1.26
1975	9	9	23.05	19.0 - 24.0	.08	
1974	10	8	23.93	23.5 - 24.5	.02	+0.76
1975	10	8	23.43	19.5 - 24.5	.08	
1974	11	5	24.00	23.5 - 24.5	.01	+0.62
1975	11	3	23.33	20.5 - 25.0	.11	
1974	12	0	-----	-----	-----	-----
1975	12	1	25.00	-----	.00	

* is significant at .05 level.

TABLE 32. Mean Manus Length of Nestling Brown Thrashers in April

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	6	6.16	6.0 - 7.0	.06	-5.26*
1975	0	7	7.07	7.0 - 7.5	.03	
1974	1	9	7.50	6.0 - 9.0	.12	-1.61
1975	1	8	8.06	7.5 - 9.0	.05	
1974	2	9	8.77	8.0 - 10.0	.09	-3.72*
1975	2	6	10.08	9.5 - 10.5	.04	
1974	3	8	10.62	9.0 - 12.0	.09	-2.27
1975	3	4	11.87	11.0 - 12.5	.05	
1974	4	6	13.66	11.5 - 14.5	.08	-1.00
1975	4	4	13.75	12.0 - 15.0	.10	
1974	5	7	15.92	15.0 - 17.5	.06	-2.00
1975	5	3	17.16	17.0 - 17.5	.02	
1974	6	7	19.00	17.0 - 20.0	.06	-0.60
1975	6	2	19.50	19.5 - 19.5	.00	
1974	7	6	20.91	20.0 - 22.0	.04	-3.64*
1975	7	3	22.83	22.5 - 23.5	.02	
1974	8	4	22.75	21.0 - 24.0	.06	-1.08
1975	8	4	23.50	23.0 - 24.0	.02	
1974	9	4	23.5	23.0 - 24.5	.03	-1.41
1975	9	4	24.0	24.0 - 24.0	.00	
1974	10	4	24.00	23.5 - 24.5	.02	-1.19
1975	10	3	24.33	24.0 - 24.5	.01	
1974	11	4	24.00	23.5 - 24.5	.17	-----
1975	11	0	-----	-----	-----	

* is significant at .05 level.

TABLE 33. Mean Manus Length of Nestling Brown Thrashers in May

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	5	7.10	7.0 - 7.5	.03	-0.63
1975	0	5	7.20	7.0 - 7.5	.04	
1974	1	7	8.14	7.5 - 9.0	.08	+1.02
1975	1	6	7.75	7.0 - 9.0	.10	
1974	2	7	9.71	9.0 - 10.5	.06	+0.93
1975	2	6	9.41	8.5 - 10.0	.06	
1974	3	6	11.16	10.0 - 13.0	.10	-0.26
1975	3	6	11.33	10.0 - 12.5	.09	
1974	4	5	13.24	11.0 - 16.0	.16	-0.64
1975	4	5	14.00	12.0 - 16.0	.11	
1974	5	5	15.80	13.0 - 17.5	.16	-0.46
1975	5	5	16.40	15.0 - 18.0	.09	
1974	6	5	17.60	15.0 - 20.0	.13	-1.61
1975	6	3	20.00	19.0 - 21.5	.07	
1974	7	3	21.83	21.0 - 22.5	.03	0.00
1975	7	3	21.83	21.0 - 23.0	.05	
1974	8	3	22.83	22.0 - 24.0	.05	-0.99
1975	8	3	23.50	23.0 - 24.0	.02	
1974	9	3	23.83	23.5 - 24.0	.01	-0.77
1975	9	2	24.00	24.0 - 24.0	.00	
1974	10	2	24.00	23.5 - 24.5	.03	-0.99
1975	10	2	24.50	24.5 - 24.5	.00	
1974	11	1	24.00	-----	.00	-----
1975	11	2	24.74	24.5 - 25.0		
1974	12	0	-----	-----	-----	-----
1975	12	1	25.00	-----	.00	

* is significant at .05 level.

TABLE 34. Mean Manus Length of Nestling Brown Thrashers in June

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	13	7.07	6.0 - 8.0	.06	+1.51
1975	0	13	6.84	6.5 - 7.5	.05	
1974	1	11	8.18	7.0 - 9.0	.06	+2.38*
1975	1	19	7.78	7.0 - 8.5	.05	
1974	2	12	9.91	9.0 - 10.5	.04	+4.82*
1975	2	19	8.97	8.0 - 10.0	.06	
1974	3	14	12.17	11.0 - 13.0	.06	+3.66*
1975	3	15	11.10	9.5 - 12.0	.08	
1974	4	13	15.11	14.0 - 16.0	.05	+4.13*
1975	4	17	13.58	10.5 - 15.0	.09	
1974	5	12	18.16	17.0 - 20.0	.05	+3.98*
1975	5	16	16.59	14.5 - 18.0	.07	
1974	6	9	20.77	20.0 - 22.0	.03	+3.76*
1975	6	12	18.95	17.0 - 20.5	.07	
1974	7	10	21.60	21.0 - 22.5	.03	+1.05
1975	7	6	21.08	19.0 - 23.0	.06	
1974	8	10	22.55	22.0 - 24.0	.03	-----
1975	8	1	19.00	-----	.00	
1974	9	5	23.60	23.0 - 24.0	.02	-----
1975	9	1	19.00	-----	.00	
1974	10	2	23.75	23.5 - 24.0	.01	-----
1975	10	1	19.50	-----	.00	
1974	11	0	-----	-----	-----	-----
1975	11	1	20.50	-----	.00	

* is significant at .05 level.

TABLE 35. Mean Manus Length of Nestling Brown Thrashers in July

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	3	7.33	7.0 - 8.0	.07	+1.61
1975	0	9	6.83	6.5 - 7.5	.06	
1974	1	6	7.58	7.0 - 8.5	.06	-0.30
1975	1	12	7.66	6.5 - 8.5	.07	
1974	2	6	9.00	8.5 - 10.0	.06	-0.48
1975	2	12	9.16	8.0 - 10.5	.08	
1974	3	5	10.70	9.0 - 12.0	.11	-0.48
1975	3	8	11.00	9.5 - 12.5	.09	
1974	4	4	13.50	12.0 - 14.0	.07	0.00
1975	4	8	13.50	11.5 - 16.5	.12	
1974	5	2	15.00	15.0 - 15.0	.00	-0.52
1975	5	8	15.56	13.0 - 17.5	.09	
1974	6	0	-----	-----	-----	-----
1975	6	9	17.88	13.0 - 20.5	.14	
1974	7	0	-----	-----	-----	-----
1975	7	8	20.18	17.0 - 22.0	.10	
1974	8	0	-----	-----	-----	-----
1975	8	4	22.25	20.0 - 23.0	.07	
1974	9	0	-----	-----	-----	-----
1975	9	2	22.25	21.0 - 23.5	.08	
1974	10	0	-----	-----	-----	-----
1975	10	2	23.00	22.0 - 24.0	.05	

* is significant at .05 level.

TABLE 36. Mean Culmen Length of Nestling Brown Thrashers

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	27	2.92	2.5 - 3.5	.08	+1.35
1975	0	32	2.84	2.5 - 3.0	.08	
1974	1	32	3.17	2.0 - 4.0	.12	+0.33
1975	1	47	3.14	3.0 - 3.5	.07	
1974	2	33	3.86	3.0 - 4.5	.10	+2.46*
1975	2	42	3.64	3.0 - 4.0	.10	
1974	3	33	4.51	4.0 - 5.0	.09	+2.99*
1975	3	33	4.22	3.5 - 5.0	.08	
1974	4	29	5.17	4.0 - 6.0	.08	+3.29*
1975	4	33	4.80	4.0 - 6.0	.09	
1974	5	26	5.84	4.5 - 7.0	.11	+2.38*
1975	5	32	5.50	4.5 - 6.5	.08	
1974	6	21	6.50	5.0 - 7.0	.11	+2.42*
1975	6	26	6.03	4.5 - 7.0	.10	
1974	7	19	7.26	5.5 - 8.5	.09	+3.33*
1975	7	20	6.57	5.0 - 7.5	.09	
1974	8	17	7.94	6.0 - 9.0	.10	+2.16*
1975	8	12	7.29	5.5 - 8.0	.11	
1974	9	14	8.32	6.5 - 9.0	.09	+1.61
1975	9	9	7.66	5.5 - 9.0	.16	
1974	10	10	8.40	7.0 - 10.0	.10	+0.54
1975	10	8	8.12	6.0 - 9.5	.16	
1974	11	7	8.78	7.5 - 10.0	.11	+0.70
1975	11	3	8.16	6.0 - 9.5	.23	
1974	12	0	-----	-----	-----	-----
1975	12	1	10.00	-----	.00	

* is significant at .05 level.

TABLE 37. Mean Culmen Length of Nestling Brown Thrashers in April

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	6	2.83	2.5 - 3.0	.09	-1.58
1975	0	6	3.00	3.0 - 3.0	.00	
1974	1	9	3.05	2.0 - 3.5	.15	-1.03
1975	1	8	3.25	3.0 - 3.5	.08	
1974	2	9	3.55	3.0 - 4.0	.11	-2.06
1975	2	6	3.91	3.5 - 4.0	.05	
1974	3	8	4.12	4.0 - 4.5	.06	-0.81
1975	3	4	4.25	4.0 - 4.5	.07	
1974	4	7	4.92	4.0 - 5.5	.11	+0.54
1975	4	4	4.75	4.0 - 5.0	.11	
1974	5	7	5.71	4.5 - 7.0	.15	+0.72
1975	5	3	5.33	5.0 - 5.5	.05	
1974	6	7	6.09	5.0 - 7.0	.11	-0.34
1975	6	2	6.25	6.0 - 6.5	.06	
1974	7	6	6.58	5.5 - 7.0	.09	-0.68
1975	7	3	6.83	6.5 - 7.0	.04	
1974	8	4	7.00	6.0 - 7.5	.10	-2.84*
1975	8	4	7.87	7.5 - 8.0	.06	
1974	9	4	7.87	6.5 - 8.5	.12	-0.75
1975	9	4	8.25	8.0 - 8.5	.03	
1974	10	4	8.25	7.0 - 9.0	.12	-0.99
1975	10	3	8.83	8.5 - 9.0	.03	
1974	11	4	9.12	7.5 -10.0		-----
1975	11	0	-----	-----	-----	

* is significant at .05 level.

TABLE 38. Mean Culmen Length of Nestling Brown Thrashers in May

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	5	3.10	3.0 - 3.5	.07	+1.41
1975	0	5	2.90	2.5 - 3.0	.08	
1974	1	6	3.25	3.0 - 3.5	.08	0.00
1975	1	6	3.25	3.0 - 3.5	.08	
1974	2	6	3.83	3.5 - 4.0	.07	+0.84
1975	2	6	3.66	3.0 - 4.0	.11	
1974	3	6	4.50	4.0 - 5.0	.10	+0.34
1975	3	6	4.41	4.0 - 5.0	.08	
1974	4	5	5.10	5.0 - 5.5	.04	-0.44
1975	4	5	5.20	5.0 - 6.0	.08	
1974	5	5	5.50	5.0 - 6.0	.09	-0.99
1975	5	5	5.80	5.5 - 6.5	.08	
1974	6	5	6.20	5.0 - 7.0	.13	-0.25
1975	6	3	6.33	6.0 - 6.5	.04	
1974	7	3	7.16	7.0 - 7.5	.04	0.00
1975	7	3	7.16	7.0 - 7.5	.04	
1974	8	3	7.66	7.0 - 8.0	.07	-0.44
1975	8	3	7.83	7.5 - 8.0	.04	
1974	9	5	8.10	7.5 - 9.0	.08	-1.28
1975	9	2	8.75	8.5 - 9.0	.04	
1974	10	4	8.12	7.5 - 9.0	.08	-2.26
1975	10	2	9.25	9.0 - 9.5	.04	
1974	11	3	8.33	8.0 - 9.0	.07	-1.95
1975	11	2	9.25	9.0 - 9.5	.04	
1974	12	0	-----	-----	-----	-----
1975	12	1	10.00	-----	.00	

* is significant at .05 level.

TABLE 39. Mean Culmen Length of Nestling Brown Thrashers in June

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	13	2.88	2.5 - 3.0	.07	+1.40
1975	0	12	2.75	2.5 - 3.0	.09	
1974	1	11	3.27	3.0 - 4.0	.13	+1.57
1975	1	20	3.10	3.0 - 3.5	.06	
1974	2	12	4.12	3.5 - 4.5	.09	+4.27*
1975	2	19	3.50	3.0 - 4.0	.11	
1974	3	14	4.78	4.0 - 5.0	.07	+4.50*
1975	3	15	4.16	3.5 - 5.0	.10	
1974	4	13	5.38	5.0 - 6.0	.08	+4.11*
1975	4	17	4.70	4.0 - 5.5	.10	
1974	5	12	6.20	6.0 - 7.0	.05	+4.43*
1975	5	16	5.46	4.5 - 6.5	.09	
1974	6	9	7.06	6.5 - 7.0	.05	+3.57*
1975	6	12	6.08	4.5 - 7.0	.12	
1974	7	10	7.70	7.0 - 8.5	.05	+4.24*
1975	7	6	6.41	5.0 - 7.0	.12	
1974	8	10	8.40	8.0 - 9.0	.05	-----
1975	8	1	5.50	-----	.00	
1974	9	5	8.90	8.5 - 9.0	.02	-----
1975	9	1	5.50	-----	.00	
1974	10	2	9.75	8.5 -10.0	.11	-----
1975	10	1	6.00	-----	.00	
1974	11	0	-----	-----	-----	-----
1975	11	1	6.00	-----	.00	

* is significant at .05 level.

TABLE 40. Mean Culmen Length of Nestling Brown Thrashers in July

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	3	3.00	3.0 - 3.0	.00	+1.09
1975	0	9	2.83	2.5 - 3.0	.09	
1974	1	6	3.08	3.0 - 3.5	.06	-0.30
1975	1	13	3.11	3.0 - 3.5	.07	
1974	2	6	3.83	3.5 - 4.0	.07	+0.80
1975	2	11	3.42	3.5 - 4.0	.07	
1974	3	5	4.40	4.0 - 5.0	.09	+1.14
1975	3	8	4.18	4.0 - 4.5	.06	
1974	4	4	5.00	5.0 - 5.0	.00	+1.53
1975	4	7	4.78	4.5 - 5.0	.05	
1974	5	2	5.00	5.0 - 5.0	.00	-1.40
1975	5	8	5.43	5.0 - 6.0	.08	
1974	6	0	-----	-----	-----	-----
1975	6	9	5.83	5.0 - 6.5	.09	
1974	7	0	-----	-----	-----	-----
1975	7	8	6.37	6.0 - 7.0	.08	
1974	8	0	-----	-----	-----	-----
1975	8	4	6.75	6.5 - 7.0	.04	
1974	9	0	-----	-----	-----	-----
1975	9	2	6.50	6.5 - 6.5	.00	
1974	10	0	-----	-----	-----	-----
1975	10	2	7.00	7.0 - 7.0	.00	

* is significant at .05 level.

TABLE 41. Mean Gape Width of Nestling Brown Thrashers

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	27	11.94	8.5 - 13.5	.08	+1.98
1975	0	33	11.51	10.5 - 12.5	.06	
1974	1	32	13.60	11.5 - 15.0	.08	+2.32*
1975	1	46	13.14	11.5 - 14.5	.06	
1974	2	34	15.55	13.0 - 18.0	.07	+2.80*
1975	2	42	14.95	13.5 - 17.0	.05	
1974	3	32	17.06	15.0 - 19.0	.06	+2.75*
1975	3	33	16.43	15.0 - 18.0	.05	
1974	4	29	18.13	16.0 - 20.0	.05	+1.93
1975	4	34	17.64	15.5 - 19.5	.06	
1974	5	26	18.82	17.0 - 20.5	.05	+0.44
1975	5	32	18.71	16.5 - 20.5	.05	
1974	6	21	19.38	18.0 - 21.0	.04	+0.81
1975	6	26	19.13	15.0 - 21.0	.06	
1974	7	18	19.44	18.0 - 21.0	.05	+0.39
1975	7	20	19.32	18.0 - 21.5	.05	
1974	8	17	19.47	18.0 - 21.5	.05	+0.98
1975	8	12	19.12	18.0 - 20.5	.04	
1974	9	9	19.46	19.0 - 21.0	.03	+2.02
1975	9	14	18.77	18.0 - 20.0	.05	
1974	10	10	19.05	18.0 - 20.0	.05	+1.00
1975	10	8	18.68	18.5 - 19.0	.03	
1974	11	7	18.50	17.5 - 20.0	.05	+1.10
1975	11	3	17.83	17.5 - 18.0	.02	
1974	12	0	-----	-----	-----	-----
1975	12	1	17.50	-----	.00	

* is significant at .05 level.

TABLE 42. Mean Gape Width of Nestling Brown Thrashers in April

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	6	10.91	8.5 - 12.0	.12	-2.18
1975	0	7	10.00	11.5 - 12.0	.03	
1974	1	8	13.06	11.5 - 14.0	.07	-1.80
1975	1	8	13.68	13.5 - 14.0	.02	
1974	2	9	14.83	13.0 - 16.0	.06	-1.91
1975	2	6	15.58	15.0 - 16.5	.04	
1974	3	7	16.28	15.0 - 18.0	.07	-1.36
1975	3	4	17.12	16.5 - 18.0	.04	
1974	4	7	17.85	16.0 - 19.0	.05	-1.33
1975	4	4	18.62	17.5 - 19.5	.05	
1974	5	7	18.50	17.0 - 19.0	.04	-2.21
1975	5	3	19.66	19.0 - 20.5	.04	
1974	6	7	19.28	18.0 - 21.0	.05	-1.71
1975	6	2	20.50	20.5 - 20.5	.00	
1974	7	6	19.50	18.0 - 21.0	.05	-1.59
1975	7	3	20.50	20.0 - 21.0	.02	
1974	8	4	19.75	19.0 - 21.0	.05	0.00
1975	8	4	19.75	19.0 - 20.5	.03	
1974	9	4	19.50	19.0 - 20.5	.04	+0.21
1975	9	4	19.37	18.0 - 20.0	.05	
1974	10	4	18.87	18.0 - 20.0	.05	-0.55
1975	10	3	19.16	19.0 - 19.5	.01	
1974	11	4	18.12	17.5 - 19.5	.05	-----
1975	11	0	-----	-----	-----	

* is significant at .05 level.

TABLE 43. Mean Gape Width of Nestling Brown Thrashers in May

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	5	12.20	11.5 - 13.0	.06	+0.71
1975	0	5	11.90	11.0 - 12.5	.05	
1974	1	7	13.71	12.5 - 15.0	.08	+1.10
1975	1	6	13.08	12.0 - 14.0	.08	
1974	2	7	15.57	15.0 - 16.0	.03	+1.36
1975	2	6	15.00	14.0 - 16.0	.06	
1974	3	6	17.08	16.0 - 18.5	.06	+0.78
1975	3	6	16.66	16.0 - 18.0	.05	
1974	4	5	18.20	17.0 - 19.0	.04	+1.02
1975	4	5	17.50	16.0 - 19.5	.08	
1974	5	5	19.00	18.0 - 20.0	.04	+0.68
1975	5	5	18.70	18.0 - 19.5	.03	
1974	6	5	19.60	18.5 - 20.0	.03	+0.85
1975	6	3	19.16	18.5 - 20.0	.04	
1974	7	3	19.66	19.0 - 20.0	.03	+0.89
1975	7	3	19.33	19.0 - 19.5	.02	
1974	8	3	19.83	19.5 - 20.0	.01	+0.99
1975	8	3	19.50	19.0 - 20.0	.03	
1974	9	5	19.30	19.0 - 20.0	.02	+1.52
1975	9	2	18.75	18.5 - 19.0	.02	
1974	10	4	19.25	18.5 - 20.0	.04	+1.15
1975	10	2	18.50	18.5 - 18.5	.00	
1974	11	3	19.0	18.0 - 20.0	.05	+1.34
1975	11	2	18.0	18.0 - 18.0	.00	
1974	12	0	-----	-----	-----	-----
1975	12	1	17.5	-----	-----	

* is significant at .05 level.

TABLE 44. Mean Gape Width of Nestling Brown Thrashers in June

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	13	12.11	11.0 - 13.0	.05	+3.38*
1975	0	12	11.20	10.5 - 12.5	.06	
1974	1	11	13.86	12.5 - 15.0	.07	+2.95*
1975	1	20	12.87	11.5 - 14.5	.06	
1974	2	12	16.12	14.0 - 18.0	.08	+3.54*
1975	2	19	14.81	14.5 - 17.0	.05	
1974	3	14	17.25	16.0 - 19.0	.05	+3.17*
1975	3	15	16.26	15.0 - 18.0	.05	
1974	4	13	18.42	17.0 - 20.0	.06	+2.97*
1975	4	17	17.44	15.5 - 19.0	.05	
1974	5	12	18.83	17.5 - 20.5	.06	+0.45
1975	5	16	18.65	17.0 - 20.5	.05	
1974	6	9	19.33	18.0 - 21.0	.05	+0.82
1975	6	12	19.04	18.0 - 20.0	.03	
1974	7	9	19.33	18.0 - 21.0	.05	0.00
1975	7	6	19.33	18.0 - 21.5	.07	
1974	8	10	19.25	18.0 - 21.5	.06	-----
1975	8	1	18.00	-----	.00	
1974	9	5	19.60	19.0 - 21.0	.05	-----
1975	9	1	17.00	-----	.00	
1974	10	2	19.00	18.0 - 20.0	.07	-----
1975	10	1	17.50	-----	.00	
1974	11	0	-----	-----	-----	-----
1975	11	1	17.50	-----	.00	

* is significant at .05 level

TABLE 45. Mean Gape Width of Nestling Brown Thrashers in July

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	3	12.83	12.0 - 13.5	.06	+3.29*
1975	0	9	11.33	10.5 - 12.0	.06	
1974	1	6	13.75	12.0 - 15.0	.08	+1.28
1975	1	12	13.25	12.5 - 14.0	.04	
1974	2	6	15.50	14.5 - 17.0	.06	+1.59
1975	2	11	14.81	13.5 - 16.0	.05	
1974	3	5	17.60	17.0 - 18.0	.02	+2.92*
1975	3	8	16.25	15.0 - 17.5	.06	
1974	4	4	17.62	16.5 - 18.0	.04	-0.09
1975	4	8	17.68	15.5 - 19.5	.07	
1974	5	2	19.50	19.0 - 20.0	.04	+1.46
1975	5	8	18.50	16.5 - 19.5	.05	
1974	6	0	-----	-----	-----	-----
1975	6	9	18.94	15.0 - 21.0	.09	
1974	7	0	-----	-----	-----	-----
1975	7	8	18.87	18.0 - 19.5	.03	
1974	8	0	-----	-----	-----	-----
1975	8	4	18.50	18.0 - 19.0	.02	
1974	9	0	-----	-----	-----	-----
1975	9	2	18.50	18.5 - 18.5	.00	
1974	10	0	-----	-----	-----	-----
1975	10	2	18.75	18.5 - 19.0	.02	

* is significant at .05 level.

TABLE 46. Mean Eighth Primary Length in Nestling Brown Thrashers

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	-----	-----	-----	-----	-----
1975	0	-----	-----	-----	-----	
1974	1	-----	-----	-----	-----	-----
1975	1	-----	-----	-----	-----	
1974	2	-----	-----	-----	-----	-----
1975	2	-----	-----	-----	-----	
1974	3	-----	-----	-----	-----	-----
1975	3	-----	-----	-----	-----	
1974	4	28	3.55	1.0 - 5.5	.35	+3.69*
1975	4	33	2.56	1.5 - 4.5	.32	
1974	5	28	6.21	2.5 - 10.0	.33	+2.31*
1975	5	32	5.19	2.5 - 7.0	.25	
1974	6	21	10.14	4.5 - 16.5	.33	+2.22*
1975	6	24	8.33	3.5 - 12.0	.25	
1974	7	19	14.39	8.5 - 19.0	.18	+2.13*
1975	7	20	12.56	6.5 - 16.5	.22	
1974	8	15	18.93	12.5 - 23.0	.15	+1.39
1975	8	12	17.20	10.0 - 20.5	.20	
1974	9	14	21.03	13.5 - 27.0	.19	+0.47
1975	9	9	20.16	11.5 - 24.0	.24	
1974	10	10	23.75	18.0 - 29.0	.15	+0.41
1975	10	8	22.81	13.0 - 27.5	.26	
1974	11	7	26.07	21.5 - 29.5	.11	+0.92
1975	11	3	23.66	17.5 - 29.0	.24	
1974	12	3		30.0 - 31.0		-----
1975	12	1	32.50	-----	.00	

* is significant at .05 level.

TABLE 47. Mean Eighth Primary Length of Nestling Brown Thrashers in April

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	-----	-----	-----	-----	-----
1975	0	-----	-----	-----	-----	
1974	1	-----	-----	-----	-----	-----
1975	1	-----	-----	-----	-----	
1974	2	-----	-----	-----	-----	-----
1975	2	-----	-----	-----	-----	
1974	3	-----	-----	-----	-----	-----
1975	3	-----	-----	-----	-----	
1974	4	6	2.83	2.0 - 4.0	.29	-0.08
1975	4	4	2.87	2.0 - 3.5	.22	
1974	5	7	5.14	3.0 - 7.0	.32	-1.00
1975	5	3	6.16	5.5 - 7.0	.12	
1974	6	7	8.78	5.0 - 11.0	.26	-1.30
1975	6	2	11.00	10.5 - 11.5	.06	
1974	7	6	12.25	8.5 - 14.0	.17	-2.48*
1975	7	3	15.50	14.5 - 16.0	.06	
1974	8	2	13.75	12.5 - 15.0	.13	-6.62*
1975	8	4	19.75	19.0 - 20.5	.03	
1974	9	4	19.50	16.5 - 21.0	.11	-3.97*
1975	9	4	23.75	23.5 - 24.0	.01	
1974	10	4	23.50	23.0 - 26.0	.11	-2.43
1975	10	3	27.33	27.0 - 27.5	.01	
1974	11	4	27.50	25.0 - 29.5	.07	-----
1975	11	0	-----	-----	-----	
1974	12	3		30.0 - 31.0		-----
1975	12	0	-----	-----	-----	

* is significant at .05 level.

TABLE 48. Mean Eighth Primary Length of Nestling Brown Thrashers in May

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	-----	-----	-----	-----	-----
1975	0	-----	-----	-----	-----	
1974	1	-----	-----	-----	-----	-----
1975	1	-----	-----	-----	-----	
1974	2	-----	-----	-----	-----	-----
1975	2	-----	-----	-----	-----	
1974	3	-----	-----	-----	-----	-----
1975	3	-----	-----	-----	-----	
1974	4	5	2.3	1.0 - 5.0	.70	-0.47
1975	4	5	2.7	2.0 - 4.0	.36	
1974	5	5	4.5	2.5 - 8.5	.54	-0.70
1975	5	5	5.4	4.0 - 7.0	.27	
1974	6	5	7.60	4.5 - 13.0	.52	-0.82
1975	6	3	9.66	8.0 - 12.0	.22	
1974	7	3	13.83	10.5 - 17.0	.23	+0.70
1975	7	3	13.66	12.0 - 16.5	.18	
1974	8	3	17.50	14.5 - 20.0	.16	-0.33
1975	8	3	18.16	16.5 - 20.5	.11	
1974	9	5	18.50	13.5 - 23.0	.23	-0.71
1975	9	2	20.75	20.0 - 21.5	.05	
1974	10	4	21.62	18.0 - 26.0	.16	-1.10
1975	10	2	24.50	24.0 - 25.0	.03	
1974	11	3	24.16	21.5 - 27.0	.11	-0.97
1975	11	2	26.75	24.5 - 29.0	.12	
1974	12	0	-----	-----	-----	-----
1975	12	1	32.50	-----	.00	

* is significant at .05 level.

TABLE 49. Mean Eighth Primary Length of Nestling Brown Thrashers in June

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	-----	-----	-----	-----	-----
1975	0	-----	-----	-----	-----	
1974	1	-----	-----	-----	-----	-----
1975	1	-----	-----	-----	-----	
1974	2	-----	-----	-----	-----	-----
1975	2	-----	-----	-----	-----	
1974	3	-----	-----	-----	-----	-----
1975	3	-----	-----	-----	-----	
1974	4	13	4.19	3.0 - 5.5	.18	+4.51*
1975	4	16	2.56	1.5 - 4.0	.31	
1974	5	12	7.70	6.0 - 10.0	.17	+5.63*
1975	5	16	5.44	3.5 - 7.0	.21	
1974	6	9	12.61	10.5 - 16.5	.15	+4.79*
1975	6	10	8.15	6.0 - 10.0	.16	
1974	7	10	15.85	13.0 - 19.0	.10	+6.14*
1975	7	6	12.50	9.5 - 14.0		
1974	8	10	20.40	18.5 - 23.0	.07	+3.86*
1975	8	1	10.50	-----	.00	
1974	9	5	24.80	23.5 - 27.0	.06	-----
1975	9	1	12.50	-----	.00	
1974	10	2	28.50	28.0 - 29.0	.02	-----
1975	10	1	14.00	-----	.00	
1974	11	0	-----	-----	-----	-----
1975	11	1	17.50	-----	.00	

* is significant at .05 level.

TABLE 50. Mean Eighth Primary Length of Nestling Brown Thrashers in July

Year	Day	Sample	Mean	Range	Coefficient of variation	t-value*
1974	0	-----	-----	-----	-----	-----
1975	0	-----	-----	-----	-----	
1974	1	-----	-----	-----	-----	-----
1975	1	-----	-----	-----	-----	
1974	2	-----	-----	-----	-----	-----
1975	2	-----	-----	-----	-----	
1974	3	-----	-----	-----	-----	-----
1975	3	-----	-----	-----	-----	
1974	4	4	4.12	2.5 - 5.0	.29	+2.80*
1975	4	8	2.31	1.5 - 4.5	.43	
1974	5	4	5.75	4.5 - 7.0	.25	+1.97
1975	5	8	4.18	2.5 - 6.0	.29	
1974	6	0	-----	-----	-----	-----
1975	6	9	7.50	3.5 - 11.0	.33	
1974	7	0	-----	-----	-----	-----
1975	7	8	11.10	6.5 - 14.5	.29	
1974	8	0	-----	-----	-----	-----
1975	8	4	15.62	10.0 - 18.0	.24	
1974	9	0	-----	-----	-----	-----
1975	9	2	16.25	11.5 - 21.0	.41	
1974	10	0	-----	-----	-----	-----
1975	10	2	18.75	13.0 - 24.5	.43	

* is significant at .05 level.

TABLE 51. T-values from Comparisons Between Mockingbirds and Brown Thrashers**

Year	Day	Weight	Manus	Culmen	Width of Gape	Eighth Primary
1974	0	-5.15*	- .66	-5.36*	-3.10*	-----
1975	0	-2.96*	+1.38	- .64	+ .07	-----
1974	1	-4.28*	+ .18	-2.51*	-1.86	-----
1975	1	-2.36*	+1.90	- .35	+1.62	-----
1974	2	-5.88*	-1.90	-3.61*	-2.51*	-----
1975	2	-2.15*	+2.11	+ .05	+1.33	-----
1974	3	-5.30*	-1.17	-4.77*	-1.38	-----
1975	3	-1.66	+1.90	- .89	+1.90	-----
1974	4	-4.27*	-1.31	-5.10*	- .29	-3.08*
1975	4	-1.09	+2.30*	-1.57	+2.12	+3.15*
1974	5	-4.66*	- .78	-6.08*	- .92	-2.10*
1975	5	-2.62*	+2.38*	-3.15*	+1.02	+3.02*
1974	6	-3.27*	- .78	-5.58*	- .47	-2.04*
1975	6	-1.58	+2.90*	-2.41*	+ .51	+3.14*
1974	7	-3.64*	-1.64	-7.64*	- .53	-2.24*
1975	7	-1.44	+3.25*	-2.78*	+ .62	+2.71*
1974	8	-2.79*	- .56	-8.91*	- .28	-2.06*
1975	8	-1.92	+2.42*	-3.53*	+ .26	+1.53
1974	9	-2.54*	+ .23	-7.14*	-1.55	-0.06
1975	9	-2.35*	+2.86*	-2.71*	-1.40	+2.53*
1974	10	-3.48*	+1.43	-5.36*	-1.31	+ .33
1975	10	-2.14*	+3.63*	-2.76*	-2.18*	+3.45*
1974	11	-2.46*	+2.03	-4.20*	- .29	+ .55
1975	11	- .47	+2.44*	- .85	- .25	+2.61*

* t-value significant at .05 level

** Negative t-values indicate Brown Thrashers were larger.
Positive t-values indicate Mockingbirds were larger.

SUMMARY

Aspects of nestling Mockingbird and Brown Thrasher growth, mortality, clutch size, and behavior were studied during the 1974 and 1975 breeding seasons in central Florida. Mockingbirds tended to nest earlier than Brown Thrashers. This may reduce competition between the two species.

Clutch size in both species was smaller than in their conspecifics from more northern regions, but there was no significant difference in clutch size between the two species.

The incubation periods in Florida were longer than those reported from more northern regions.

Mockingbirds were more successful nesters than were Brown Thrashers. Only 21% of Mockingbird clutches were lost prior to hatching as compared to 45% of the Brown Thrasher clutches. Brown Thrasher clutches suffered more partial egg loss than did Mockingbirds.

Fledging success in Brown Thrashers was also lower than in Mockingbirds. Forty-one percent and 46% of the Mockingbird nestlings fledged in 1974 and 1975 respectively, as compared to 22% and 13% in Brown Thrashers. The lower success of Brown Thrashers may be due to their tendency to nest later in the season, the possibility that the habitat may have been marginal for their

nesting requirements, and their vociferous behavior in the vicinity of the nest site when disturbed.

Nestling mortality in both species increased towards the end of the season. Predation was the chief cause of nestling mortality, although starvation increased in importance during the latter part of the breeding season. Possible reasons for the increased starvation of nestlings during the latter part of the breeding season included parasitism, onset of molting in adults, and changing hormonal levels in the adults late in the season.

The eggs of both species sometimes hatched asynchronously. This did not, however, appear to be a valuable mechanism for maximizing reproduction during periods of low food availability.

Nestlings of both species resembled typical altricial young in their appearance and behavior. Important differences in the appearance of Mockingbirds and Brown Thrashers prior to development of plumage were the number of down in the abdominal region and the color of the soft parts. Behaviorally the two species were similar, but Brown Thrashers were more discriminate in begging, less likely to grasp the nest lining, more likely to huddle in the nest, and less likely to attempt to escape.

The growth curves of both species approximated a logistic curve. The growth rate for each species varied from month to month and year to year. July nestlings tended to be smaller in both species. Interspecific comparisons showed that Brown Thrashers were usually heavier and had longer culmens than Mockingbirds of the same

age. Mockingbirds had a longer manus and eighth primary relative to the weight of the birds. When the weight differences between the species was not great, the manus and eighth primary were absolutely longer in Mockingbirds.

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