

FLIGHT WHISTLE INCORPORATED IN BROWN-HEADED COWBIRD SONG¹

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Avian vocalizations are usually divided into two categories, songs and calls, a distinction that is largely based on arbitrary criteria. Generally, songs are viewed as being loud, acoustically complex, and delivered by males during the breeding season; conversely, calls are thought of as brief, acoustically simple vocalizations, that may or may not be seasonal and sex-specific (e.g., Howard 1920, Marler and Mundinger 1971). This distinction has been sufficient for most studies although, as noted by Krebs and Kroodsma (1980), for any given species one or more of these guidelines may be violated, and in some cases calls may even serve as "a kind of song substitute" (Thielcke 1969:315).

The vocalizations of the brood parasitic Brown-headed Cowbird (*Molothrus ater*) have traditionally been classified according to the features outlined above. Friedmann (1929:164) describes male cowbird song as a series of low frequency "bubbling guttural notes" followed by a "high, shrill, thin, squeaky *tsee* . . ." Song is usually accompanied by a courtship display that involves spreading the wings and tail and bowing the body forward. Song is heard most frequently during the breeding season, where it functions both in intra-sexual and intersexual interactions (Friedmann 1929). Songs are learned (West and King 1986), and each male possesses several different song types that are shared with other males of the local population and vary geographically (Dufty 1985).

Friedmann (1929) also describes several call notes for male cowbirds. The most frequently heard of these is the flight whistle, a vocalization that is given just prior to the onset of flight (Friedmann 1929); it is also given at the time of landing and, occasionally, during flight (pers. observ.). Rothstein et al. (1986) suggest that this vocalization is often used in long distance communication. Playbacks of flight whistles do not elicit the copulation solicitation response from females, a response that is evoked by playbacks of male song (King and West 1977). Flight whistles are acoustically simpler than songs, often containing elements that are nearly pure tones and/or slow frequency-sweeps (Fig. 1). Flight whistles also exhibit geographic variation (Tyler 1920; Rothstein et al. 1986; Dufty, unpubl.), and captive males raised with exposure to an alien flight whistle will produce that alien call (Rothstein and Fleischer 1987), suggesting that flight whistles, like

songs, are learned. This is in keeping with an ever-growing literature describing call dialects and call learning in wild birds (e.g., Mundinger 1970, Marler and Mundinger 1975, Zann 1975, Ficken and Weise 1984).

Since both the song repertoire and the flight whistle call apparently exhibit learned components, the possibility exists that mistakes in learning can occur, whereby elements of one vocalization are incorporated in the other. I report here one such occurrence, in which a wild-caught male Brown-headed Cowbird included part of his flight whistle in one of his song types.

As part of another investigation, free-living male cowbirds were captured during March to July 1982 in potter traps on the grounds of The Rockefeller University Field Research Center in Millbrook, New York. Their songs were recorded on a Tandberg Series 15 tape recorder at 7½ ips in an IEC acoustic chamber. Sound spectrograms were made by playing the vocalizations at half speed into a Kay Digital Sona-Graph, model 7800, using the 8-kHz range and the wide band (300 Hz) filter.

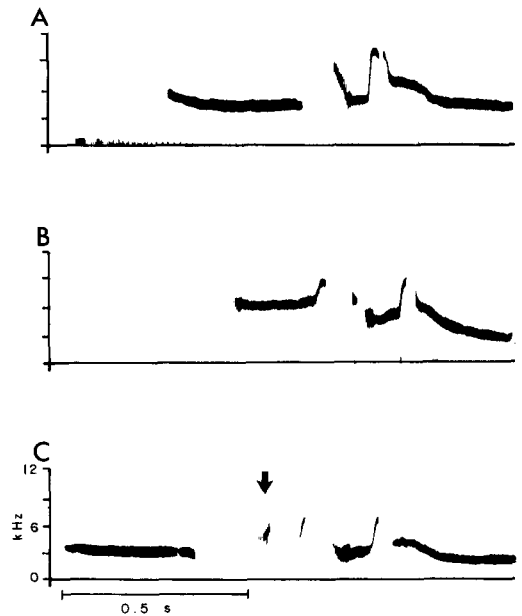


FIGURE 1. Sonograms of flight whistles of (A) male WY, and (B) and (C) two other male Brown-headed Cowbirds from the same area. The arrow in (C) indicates an additional element produced by many birds.

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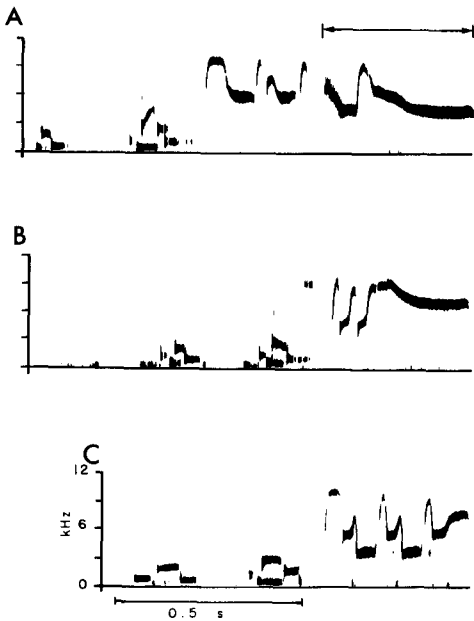


FIGURE 2. Sonograms of the song repertoire of male WY. (A) Song type containing a portion (in brackets) of the flight whistle. (B) and (C) Remaining two song types of WY.

Nine males were recorded in this way (13 others were recorded in the field). One second-year male (aged according to Selander and Giller [1960]; age terminology is that of the Bird Banding Laboratory of the U.S. Fish and Wildlife Service), identified as WY, had a repertoire of three song types (Fig. 2) and a flight whistle typical of the local population (Fig. 1A). One song type (Fig. 2A) contained the low frequency introductory notes typical of normal song, but also included the terminal element of the flight whistle as part of the *tsee* of the song. Of 115 songs recorded from male WY, the hybrid song was sung 25 times and the other two types (B and C in Fig. 2) were sung 51 and 39 times, respectively. Six flight whistles were recorded from WY, all similar to the one shown in Figure 1A.

Male WY was heard intermittently throughout the summer (cowbirds from the surrounding environs regularly use the field center as a feeding site). Both types of vocalization were used only in the contexts described above; i.e., song, including the hybrid song, was used in advertising bouts and in interactions with conspecifics, while the flight whistle was heard upon the arrival or departure of WY. Male WY did not return the following year.

The inclusion of part of the flight whistle in the *tsee* note of the song may have been facilitated by the fact that both are acoustically similar sounds, possessing overlapping frequency, temporal, and structural parameters (compare Figs. 1 and 2). Such translocations from flight whistle to song could result in new song types (as in the present case) or, if they occur in the opposite direction, new flight whistles.

Males of some species occasionally produce call notes in the subsong stage of song development, although these calls do not remain in crystallized song (e.g., Song Sparrow, *Melospiza melodia* [S. Peters, pers. comm.]). Adult males of other passerine species do occasionally include calls in their song bouts (e.g., Marler and Mundinger 1975). In addition, some males broadcast calls and songs together immediately prior to copulation, when the vocalization rate may be very high (e.g., Poulsen 1958), a behavior exhibited by cowbirds (West et al. 1981). However, males of only a few oscine species, such as the Skylark (*Alauda arvensis*), the Chaffinch (*Fringilla coelebs*), and the Zebra Finch (*Poephila guttata*), are reported to systematically and regularly include calls or elements of calls in their songs (Thorpe 1961, Price 1979). Whether this phenomenon occurs with any regularity in the Brown-headed Cowbird remains to be seen; nonetheless, its occurrence in this instance should serve as a reminder of the artificial and tenuous nature of the song-call dichotomy.

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SCANNING BEHAVIOR OF FINCHES IN MIXED-SPECIES GROUPS¹

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One advantage often attributed to group living is that each individual can reduce the time it spends being vigilant without increasing its risk of predation (Pulliam et al. 1982). Individuals in a single species group have been shown to decrease the time they spend scanning as group size increases (Bertram 1980, Jennings and Evans 1980, Elcavage and Caraco 1983, Popp 1987). Effects of heterospecific individuals on vigilance rates in mixed-species feeding groups is not as well understood (Metcalf 1984, Sullivan 1984, Beveridge and Deag 1987). Are scanning rates affected by the presence of heterospecifics in the same way as by conspecifics and is the effect the same for all species? I investigated this question in mixed-species groups of American Goldfinches (*Carduelis tristis*), Pine Siskins, (*Carduelis pinus*), and Purple Finches (*Carpodacus purpureus*) at a winter feeding station.

METHODS

The finches were videotaped while on a feeder at Elkhart Lake, Sheboygan County, Wisconsin between 5 January and 20 March 1985. All videotaping was done between 07:00 and 11:00 CST and when weather conditions were sunny, with temperatures between 5 and -10°C and with mild winds. The feeder, stocked with

niger (thistle) (*Guizotia abyssinica*) seeds, was 1.5 m off the ground and had a 7- × 25-cm platform from which the finches could feed. The finches would arrive at the feeder in groups of up to 70 birds. While finches were seen in mixed-species groups away from the feeder, the feeder probably forced individuals of different species into closer proximity than would be normal. Feeders in the study area were, however, a major source of food for all three species (pers. observ.).

Scanning rates (scans/sec) were recorded during the first 50 visits by goldfinches to the feeder in four contexts: when alone, with a conspecific, with a Purple Finch, and with a Pine Siskin. Similar records were collected for the Pine Siskins and Purple Finches. Observations of finches in groups were included only when two birds (modal group size) were at the feeder. A visit was included only if it exceeded 30 sec (visits ranged from 30 to 291 sec). A scan was considered to have occurred when a finch lifted its head to horizontal, sometimes turning it sideways, and then returned to feeding. Scans were nearly instantaneous (i.e., 0.1 sec) in the siskins and goldfinches or slightly longer (0.2 to 0.3 sec) in the Purple Finches. There was little variation in scan duration for any of the species and scan duration was not considered in this study. Data were combined for both sexes because of the difficulty in determining the sexes from the videotapes. Mean scanning rates were compared using ANOVA and Tukey's test for pairwise comparison at a 0.05 family level of significance.

The finches were not color-banded, so it was not possible to ensure that all observations involved different individuals (i.e., that the data were independent).

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