

Blackpoll Warbler [*Dendroica striata*] [Eckhardt 1979; Sabo, Ecol. Monogr. 50:241–259, 1980]). Noon (1981) suggested that the Veery was less well-adapted for and less dependent on true aerial prey captures, when compared to the most arboreal *Catharus*, Swainson's Thrush (*C. ustulatus*), because of the higher vegetation densities typical of Veery habitats. Veery and Hermit Thrush foraging was dominated by foliage-directed prey captures requiring flight and resembled the foraging strategy employed by other midstory species, such as tanagers (*Piranga* spp.) and small tyrant flycatchers (*Empidonax* spp.), which Robinson and Holmes (1982) termed "open-perch searching" (Williamson 1971, Eckhardt 1979, Holmes et al. 1979).

Frakes and Johnson (Condor 84:286–291, 1982) reported a parallel case of convergence in foraging behavior for two *Empidonax* flycatchers. These species typically occupied separate macrohabitats and displayed distinct foraging patterns, but where they co-occurred in intermediate environments, their foraging proved very similar. Habitat structure apparently plays a role in determining foraging strategy independent of interspecific interactions (Maurer and Whitmore, Wilson Bull. 93:478–490, 1981; Seidel and Whitmore, Wilson Bull. 94:289–296, 1982).

Conclusions.—The Hermit Thrush and Veery at Trout Lake were similar both at the level of macrohabitat structure and the level of foraging behavior. The clearest evidence for resource partitioning occurred at the level of microhabitat use, with the thrushes differing significantly in their overall activity and feeding patterns among height strata and vegetation types within their shared macrohabitat.

My observations support the general premise that large scale separations among similar species along particular resource axes, e.g., prey type or habitat type, should have their evolutionary origins in smaller scale differences among co-occurring local populations (Wiens and Rotenberry, Ecol. Monogr. 50:287–308, 1980).

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Interspecific song learning in a wild Chestnut-sided Warbler.—Vocal learning involving imitation is the prevalent mode of song development in songbirds. The evidence for vocal learning both from experimental studies and from local song variants shared among neighbors (dialects) indicates that songbirds generally learn from their own species, and that a genetically determined signal recognition center ("auditory template") constrains song learning within the species (Marler, in *Function and Evolution in Behaviour*, Baerends, Beer, and Manning, eds., Clarendon Press, Oxford, 1975; Payne, *Auk* 97:118–134, 1980; Marler and Sherman, *J. Neuroscience* 3:517–531, 1983). However, an increasing number of field and experimental studies have shown instances where birds learn the song of other species (Baptista, *Z. Tierpsychol.* 30:266–270, 1972; *Wilson Bull.* 93:265–267, 1981; Baptista and Morton, *Auk* 98:383–385, 1981; Eberhardt and Baptista, *Bird-Banding* 48:193–205, 1977; Kroodsma et al., *Wilson Bull.* 95:138–140, 1983). Evidence of vocal learning in the Parulinae (wood warblers) comes from one experimental Chestnut-sided Warbler (*Dendroica pensyl-*

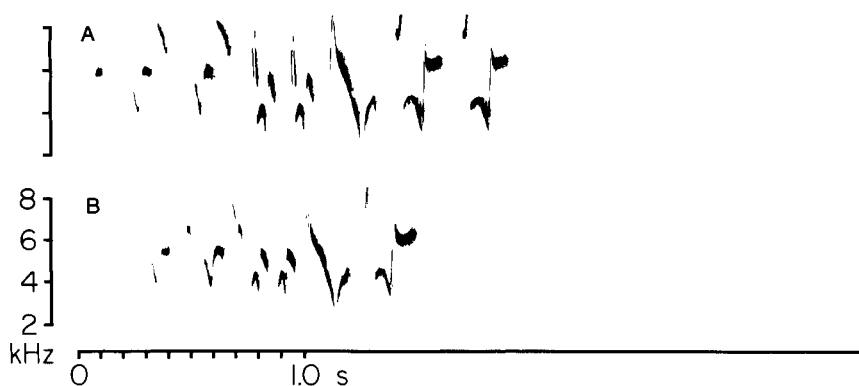


FIG. 1. A. Song of a wild Indigo Bunting XSOW at Niles, Cass Co., Michigan, recorded 24 May 1983. B. Song of a wild Chestnut-sided Warbler recorded at Niles, Cass Co., Michigan, 8 June 1983. The song-figures (notes) and their sequence are nearly identical in the two birds, but the phrasing of the song elements is more rapid in the warbler. All song-figures and their sequence are characteristic of a local song dialect of the buntings.

vanica) that imitated parts of the tutor songs of a Common Yellowthroat (*Geothlypis trichas*) and from a wild Common Yellowthroat that had a nearly perfect match of a song of a Chestnut-sided Warbler (Kroodsma et al. 1983). Observations of matching songs among neighboring wild males provides field evidence that wild Chestnut-sided Warblers develop their songs by imitative learning (Kroodsma, *Auk* 98:743–755, 1981).

We observed a wild Chestnut-sided Warbler near Niles, Cass Co., southern Michigan, with a song that was a nearly perfect match of local Indigo Buntings (*Passerina cyanea*). The bird sang at the edge of a secondary mesic woodland bordering McKinzie Creek in habitat with sugar maples (*Acer saccharum*), elms (*Ulmus* sp.), and willows (*Salix* sp.) about 10 m high, and dense shrubs along the woodland edge. At 07:45 on 31 May 1983, LLP recorded a bird singing a bunting song that differed from individual buntings known to live in the woods. While the bird was being recorded, it was seen and identified by LLP and SMD as an adult male Chestnut-sided Warbler. At 07:10 on 8 June the circumstances from the May encounter were repeated 120 m away by RBP and SMD. The bird sang in a bare tree in full view with its bill opening wide with each song. In neither instance did the two Indigo Buntings on this warbler territory respond to the warbler.

Comparison of audiospectrograms of the warbler's song with that of local Indigo Buntings indicated that the warbler had the same song (that is, the same sequence of song-figures) as eight male buntings located 0.8–1.1 km to the east of the warbler (Fig. 1). Indigo Bunting neighbors commonly match songs with each other (Payne et al., *Behaviour* 77:199–221, 1981; Payne, *Anim. Behav.* 31:788–805, 1983). All 17 warbler songs were identical with respect to their song-figures, sequence, and timing. The warbler's song was delivered more rapidly than those of the buntings because four out of five of the time intervals between song-figures of the warbler were of shorter duration than the intervals between the same figures in the bunting song. In its timing the song tended to resemble the normal, faster-paced song of wild Chestnut-sided Warblers. The precise matching of bunting song-figures and their sequence indicated that the warbler had copied the song of the local Indigo Buntings. The warbler's song consisted of two paired song-figures followed by two more song-figures,

each given only once (Fig. 1B). Most of the eight buntings that sang this song regularly paired each of these four different figures. Only one bunting, banded XSOW, sang the second from the last song figure without repetition (Fig. 1A). No buntings were recorded singing the last song figure singly as the warbler did. It appears that the Chestnut-sided Warbler copied XSOW, an adult bunting who has been at the study area for at least 3 years. The song may have been copied early in 1983 (XSOW was first seen in 1983 on 24 May) or in an earlier year. Although additional Chestnut-sided Warblers were observed on the study area regularly during the breeding seasons from 1978–1983, none were heard singing unusual songs.

The context of singing suggests that the copied song may have been used by the warbler as an “Accented Ending” song. Chestnut-sided Warblers have two main classes of song, Accented Ending and Unaccented Ending (Lein, *Can. J. Zool.* 56:1266–1283, 1978; Kroodsma 1981). Accented Ending songs tend to be sung more frequently early in the season and before the male is mated. No mate or nests were found for the warbler and the warbler was not seen or heard on this territory later in the season. The structure of the song differs from both the Accented Ending and Unaccented Ending songs in the details of the terminal notes that define the song classes. In certain features the form of the terminal song figure resembles the penultimate song figure in the Accented Ending type 2 of a warbler song neighborhood (Lein 1978: Fig. 2). The penultimate song figure resembles a warbler note recorded by Lein (1978: Fig. 4f, 6a, middle notes) in some Unaccented Ending songs.

The observation of interspecific song learning by a Chestnut-sided Warbler of a local song of an Indigo Bunting suggests that song development in this species is not tightly constrained by an innate predisposition to learn only species-same behaviors. The warbler's faster delivery of the bunting song-figures may, however, reflect a species-specific constraint in the same manner as Greenfinches (*Carduelis chloris*) copying Canaries (*Serinus canarius*) retain Greenfinch-specific interval timing (Güttinger, *Z. Tierpsychol.* 49:285–303, 1979). The closer match of the wild warbler's song with the apparent tutor's song than was observed in the experimental Chestnut-sided Warbler (Kroodsma et al. 1983) is consistent with the suggestion that song learning in birds may normally depend upon social interaction (Baptista and Morton 1981, Kroodsma 1981, Payne 1983). The circumstances in which the warbler copied the bunting song may have involved aggressive social interaction; the two species overlap in habitat and both nest in shrubs below 1 m. The bunting may also have caught the ear of the warbler at a critical period in its behavioral development. Whether song development in the warbler involved response to the similar acoustic features of songs of the two species, or to social interaction, or both, is unknown.

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An apparent hybrid Black-billed × Yellow-billed Cuckoo.—On 22 October 1974, R. Miller, Meridian, Butler Co., Pennsylvania, found a dead cuckoo and took it to the taxidermy laboratory of Carnegie Museum of Natural History, then located in Meridian. It was prepared as a study skin by O. M. Epping, and eventually delivered to the museum in Pittsburgh. Superficially similar to a Yellow-billed Cuckoo (*Coccyzus americanus*), it was catalogued (CM 149972) into the museum collection as a member of that species. It was sexed as a male; no notes were made by the preparator about fat or molt, but the specimen has obvious