SPECIES-SPECIFICITY AND MIMICRY IN BIRD SONG: ARE THEY PARADOXES?

A REEVALUATION OF SONG MIMICRY IN THE EUROPEAN STARLING

by

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(With 7 Figures)

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Introduction

BAYLIS (1982) defines vocal mimicry “as the resemblance of one or more vocalizations of an individual bird of one species either to the vocalizations typical of individuals of another species or to some environmental sound”. Examples of this phenomenon have been described in different species and in some cases mimicry constitutes the major component of a bird’s repertoire as in the lyrebird Menura novaehollandiae (ROBINSON, 1975), or in the marsh warbler Acrocephalus palustris (DOWSETT-LEMAIRE, 1979).

Several hypotheses have been proposed to explain the possible functions of such a phenomenon: mimicry of the calls of a predator to better repel the latter, or to deter competitors, or simply to increase the size of the song repertoire to improve its stimulus value (ARMSTRONG, 1963; CODY, 1973; DOBKIN, 1979; HARTSHORNE, 1973, 1976). In Viduinae, mimicries of the host species enable males and females of the parasitic species to know by which species they were raised (NICOLAI, 1973; PAYNE, 1973, 1976). In the case of the marsh warbler, the mimicries

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might provide clues about their winter quarters (Dowsett-Lemaire, 1979). Thus, some hypotheses favour interspecific functions whilst others suggest an intraspecific role for mimicry, in particular in relation to the concept of sexual selection. In fact, a complementary aspect is the recognition, or otherwise, of the mimicry by the model. In the lyrebird, the species mimicked are not "deceived" in spite of the apparent quality of the mimicry (Robinson, 1974). In fact, there are few examples of reaction by the model species to the mimicked song (Baptista & Catchpole, 1989). In some cases, that can be explained by the fact that the birds may reorganize interspecific mimicries to give them some of the characteristics of their own species (Tretzel, 1966). In this context the question arises of the possible species-specific constraints in the ability to mimic. Especially we may wonder where mimicking species stand in relation to the "template" concept which has been developed to explain selective learning in species not normally showing mimicry (Konishi, 1965; Marler, 1970). Even in those species it has been shown that the "inhibition" linked to the template can in some conditions be suspended thus permitting interspecific mimicry (Baptista & Petrinovitch, 1984; Pepperberg, 1985). It is possible that those species regularly showing mimicry do not have a template; however they also show song structures characteristic of their own species. Could that be solely due to intraspecific social stimulation, or is there nevertheless some selectivity in what is learned? Güttinger (1974) suggested that greenfinches Carduelis chloris preferentially mimic nuthatch (Sitta europea) calls on account of the fact that their trilled structure recalls their own song.

In this paper, we examine this problem in the starling, a species well known for its ability to mimic. We suggest that the starling shows some selectivity in its mimicries which derives from its autochthonous song structures. We develop the idea that the starling possesses two types of "templates" in its species-specific song which are reflected in its mimicry by quite different degrees of selectivity. We also suggest that these two categories of mimicry have evolved for functional reasons that are linked to the corresponding functions of the species-specific songs themselves. The high quality and precision of the starlings' mimicry have been shown by the work of Hindmarsh (1984) in Scottish populations. In his first paper, this author concluded that "common simple sounds are preferentially mimicked" because they are easy to learn and resemble their own whistled songs. However, in a subsequent paper, Hindmarsh (1986) modified his views and concluded that the actual structure of the sounds mimicked did not matter because the widened acoustic filter accepts a