4pAB4. Categorization of budgerigar (Melopsittacus undulatus) warble elements.

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Abstract:

The warble song of budgerigars is composed of a variety of elements without any obvious sequential order. Some of the elements also occur as single utterances. A previous study classified warble elements into 42 groups by visual inspection of spectro grams. However, the density of warble (about 140 elements/min, up to 30 min in duration) makes this method both laborious and time-consuming for analyzing a large amount of warble. Here three human raters took 860 elements from 3 birds and sorted the sonograms into 9 general groups with an inter-rater reliability of 89%. Next, these elements were used to train a neural network. This network learned to categorize a large number of warble elements efficiently with 84% reliability (compared to human raters). Further examination of other warble streams revealed that warble elements are not evenly distributed across these nine groups for the same bird, but the relative proportion of different elements in warble categories is similar across three budgerigars. Ongoing studies are examining whether birds vary the proportion of elements in different social contexts to better understand the biological function of this complex vocalization. [This work is supported in part by DC-00046 and DC-00198 to R.D.]