

Public Abstract

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Some of the most important processes in the lives of many animals involve competition mediated by signal production. In frogs, this competition often takes place in the form of choruses in which males gather and call to attract females and repel rival males. Although we know a great deal about the former function of frog calls, we know relatively little about the 'aggressive calls' used by males in competition with rivals. I used a variety of techniques to examine the causes and consequences of aggressive acoustic competition in two treefrog species: *Hyla versicolor* and *Dendropsophus ebraccatus*. I observed how males used aggressive calls by eliciting such behavior either via playback of calls through speakers or through staged interactions in which males exhibited natural aggressive behavior in the laboratory. I found that each species used aggressive calls in different ways, and in some cases the signal function of the aggressive call was not in fact closely related to aggressive behavior but rather appeared to function as part of a strategy to attract females. When aggressive calls were used to resolve disputes between males, I found that certain characteristics of aggressive calls predicted the likely winner of the interaction. The most important call characteristics were those that are likely related to the energetic costs of calling. I conclude that further study of aggressive calling in other frog species, using the methods I developed in this thesis, is necessary for a full understanding of communication in these important species for animal behavior research.