



ScienceWatch – Chickadee Chatter

Who among us hasn't heard the eponymous call of the black-capped chickadee (*Poecile atricapilla*)? Its strident *chick-a-dee-dee-dee* is commonly heard throughout northeastern woodlands. Most of us know it is an alarm call that signals other chickadees to mob an invading predator, but until now no one could know its true significance. Now a team headed by Ph. D. student, Christopher Templeton, from the University of Washington, Seattle, WA, has shown that the *chick-a-dee* alarm call is more complicated than anyone ever expected.

The chickadee, in fact, has two alarm calls: a soft, high-pitched *seet* call and the louder *chick-a-dee*. Earlier studies showed that the *seet* call is used to warn others of predators flying overhead, while the *chick-a-dee* call is not only used to identify flockmates, but is also a warning of stationary predators and a mobbing call that recruits other chickadees (and other species) to harass a perched predator. Writing in the June 24, 2005 issue of the journal *Science*, Templeton *et al.*, demonstrate that the *chick-a-dee* call has a further refinement, which communicates predator size to other chickadees.

The team recorded and analyzed over 5,000 *chick-a-dee* calls made by flocks of chickadees living in a semi-natural state in large, outdoor, wooded aviaries. The calls were recorded after placing a single live predator in the aviary. The raptor predators consisted of 13 species of owls, hawks, and falcons, ranging in size from the northern pygmy-owl (*Glaucidium gnoma*) at 70 grams (2.5 ounces) and 15 centimeters (6 inches) to the great horned owl (*Bubo virginianus*) at 1,400 grams (over 3 pounds) and 48 centimeters (19 inches). Two mammalian predators, domestic cat (*Felis domesticus*) and ferret (*Mustela putorius*) were also included, while the presentation of a bobwhite quail (*Colinus virginianus*) served as a control.

The team found that there was an inverse relationship between the number of *dee* notes per call and predator wingspan or size, *i.e.*, smaller predators elicited more *dee* notes than larger ones. This relationship also held for the two mammalian species. Moreover, the chickadees did not appear to discriminate between raptors and mammals. To show that differences in the alarm call transmitted different information to other chickadees, calls elicited by different predators were played back to flockmates in the aviaries. *Chick-a-dee* calls caused by small predators evoked different behaviors from those caused by large predators. Chickadees exhibited more intense mobbing behavior when they heard an alarm call recorded in response to a pygmy-owl than a great horned owl or the control. More birds came to the speakers and they came closer when alarm calls in response to the small predator were played.



One might expect larger predators to elicit more intense alarm calls and greater mobbing behavior. However, the opposite is true because in the forested world of the chickadee smaller predators are more maneuverable and therefore are a greater hazard to them. The smaller predators elicit more intense alarm calls reflecting the greater danger for the chickadees and this greater risk to flockmates is conveyed by more *dees* in the alarm call. Evidently, chickadee survival depends on paying careful attention to what we consider just chatter.