

Blue Jays Mimic the Calls of Red-shouldered and Broad-winged Hawks

by
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Blue Jays (*Cyanocitta cristata*) have long been known to mimic the calls of other birds. Some consider that they are able to reproduce the calls of many different species (Baird *et al.* 1875; Terres 1980), although they are most renowned for vocal mimicry of hawks, particularly the Red-shouldered Hawk (*Buteo lineatus*) (Nicholson 1936; Bent 1946; Godfrey 1986). The Red-tailed Hawk (*B. jamaicensis*) and the American Kestrel (*Falco sparverius*) have also been included in the jay repertoire (Baird *et al.* 1875), and I can add the Broad-winged Hawk (*B. platypterus*). If jays are as good a mimic of smaller birds as they are with hawks, the habit may often be overlooked. The mimicked sound heard by a field observer might be assumed to emanate from the appropriate species, rather than from a jay that might not even be seen. But why they should mimic other birds, and particularly hawks, has not been adequately answered. The following observations, while not providing definitive answers, suggest that the habit is not of significant sur-

vival value to the birds.

On 21 July 1987, about 10 km southeast of Dwight, Muskoka District Municipality, Ontario, in an area where I have heard Red-shouldered Hawks for many years (including 1987), I was recording Blue Jays and the associated scolding by Least Flycatchers (*Empidonax minimus*) and Red-eyed Vireos (*Vireo olivaceus*) when I realized that it was the jay giving Red-shouldered Hawk-like screams, rather than a hawk itself. To my ears the jay call was a very good rendition of the hawk, except that the jay gave only single, well-spaced syllables, rather than the usual repetitive call of the hawk. Spectrographs (Figure 1a, 1b) revealed that the syllables uttered by the jay (a) were similar to those of a Red-shouldered Hawk. The dominant frequency is nearly identical and the structure of the calls, including harmonics, is similar. In the second half of the call, however, the jay (a) has emphasized the lower of two simultaneous frequencies in the 2 to 3 kHz range (that soon blend together), while in the hawk call (b), this lower band

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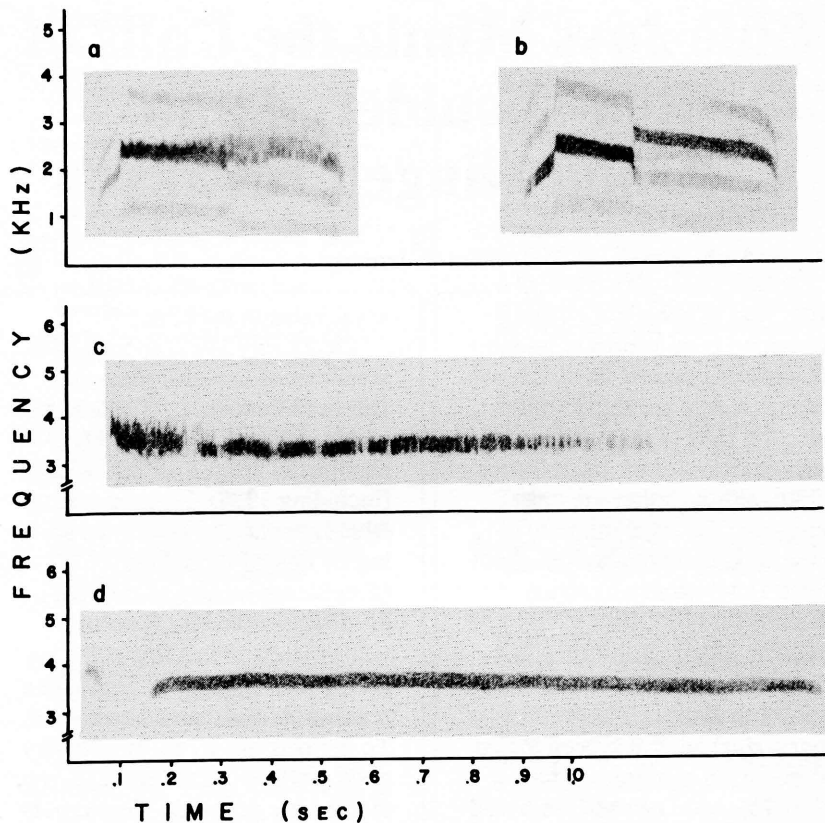


Figure 1: Sonograms (wide band) of:

- (a) a Red-shouldered Hawk-like call given by a Blue Jay on 21 July 1987 in Muskoka District Municipality, Ontario (dominant frequency 2-3 kHz; durations .47 sec);
- (b) a syllable from a longer call given by a Red-shouldered Hawk, recorded earlier on 21 July 1987 in the same locality as (a) (dominant frequency 2-3 kHz; duration .51 sec);
- (c) a Broad-winged Hawk-like call given by a Blue Jay on 26 July 1987 in Muskoka District Municipality, Ontario (dominant frequency 4.0-4.5 kHz; duration 1.1 sec);
- (d) an example of a Broad-winged Hawk call recorded 7 June 1983, in Hastings County, Ontario (dominant frequency 4.5-5 kHz; duration 1.45 sec).

has all but disappeared. The jay call is slightly shorter and noticeably less pure in tone, but given the complexity of the call, it is a remarkable resemblance.

Only five days later, as I stood recording a bird on the shore of a small lake, in the very same area, I

heard what I thought was a Broad-winged Hawk calling on the other side of the lake. I expected Broad-winged Hawks, as I have also found them nesting there, and birds were present in 1987. Soon, I noticed a Blue Jay fly across the lake to land within 30 m of where

I stood. Both as it flew, and after landing in the forest, it uttered a series of calls that I would have continued to think were given by a hawk if I had not seen the jay. Sonograms (Figure 1c, d) again revealed a similar call. The jay version (c) is shorter and fades out more noticeably toward the end, but the frequency of the call is very close to the Broad-winged Hawk example (d), and there is likely variation among hawks. When given by the jay, the opening syllable is prolonged somewhat, there are small but inaudible breaks, and the call is less pure in tone, but to human ears it sounds essentially identical except for duration.

As would be appropriate at the end of July, what appeared to be family groups of jays, with young long out of the nest, were seen in this area on a number of occasions during the week these recordings were made. But on both recording occasions, lasting about one minute each, the jays giving the calls appeared to be alone, although likely within hearing distance of other jays.

There have been numerous theories put forward as to why birds in general mimic other species (see Bayliss 1982) or why jays in particular might do this (Goodwin 1976). Unfortunately there is as yet no proven reason why Blue Jays should want to mimic the sounds of hawks. The fact that jays have been doing it for decades suggests that it may happen more

than just by chance. However, a jay uttering hawk calls while foraging alone in the forest late in the breeding season does not lend support to theories of enhanced sexual selection during pairing, mate identification within pairs, or of territorial defense during the mating season. And since nests were not involved in these examples, nor were the hawks present, theories relating to their use in mobbing or of enhancing threats to other birds that might be approaching nests are also not supported. The vireos and flycatchers were seemingly unaffected by the mimicked hawk calls, as they continued to scold the jays.

Perhaps the hawk calls are of value to jays at some particular time during the year. The birds that I recorded may well have been young, practicing their vocal repertoire for the future. But why should they learn hawk calls in the first place? If such calls really were of advantage to jays in conveying a more precise indication of a threat to the birds themselves or to their nest, a possible reason suggested by Goodwin (1976), why should they not mimic *Accipiter* species (Sharp-shinned Hawks *Accipiter striatus*, were also seen in these forests in 1987) rather than *Buteos* that are less dangerous to small passerines. And if the hawk calls were of value in such situations, why would all jays not quickly acquire the habit (assuming they do not, because it is not apparent to us that

all jays have this habit)?

At present, the hawk calls given by Blue Jays have no more adequate explanation than that they may be sounds that the jays could easily learn, and amount to nothing more than "copying mistakes" of no value to the jays. Goodwin (1976) indicates that mimicked sounds are often given by jays in highly emotional situations, presumably similar to those under which the jays first heard the sound. The hawk calls that I recorded then, although not given at a time of any apparent stress, may have been acquired during a period of emotional stress caused by the presence of hawks near them, at a time when they were learning their own songs and sensitive to such sounds in their environment. Calling *Buteos* could easily be near Blue Jay nests or newly flying young and could create such stress.

Perhaps the quieter nature of *Accipiters* when hunting lessens the possibility of jays acquiring *Accipiter* calls. Even more likely to preclude this possibility, however, is the fact that the *Accipiters* are going to be much more lethal to young jays. When learning calls, the jays are likely to be rather young, and better able to survive the presence of *Buteos* in close proximity.

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