

## DOWNY WOODPECKER AND WHITE-BREASTED NUTHATCH USE "VICE" TO OPEN SUNFLOWER SEEDS: IS THIS AN EXAMPLE OF TOOL USE?

by William E. Davis, Jr.

During the past three winters I have watched Downy Woodpeckers and White-breasted Nuthatches using knotholes as "vices" to hold sunflower seeds while shucking them. I have found no direct reference to this behavior for either species, although nuthatches are well-known cachers of food and presumably open cached food items where they are cached. The purpose of this paper is to document this vice-using behavior and to discuss whether it should be considered as tool use.

On February 2, 1993, I watched a male Downy Woodpecker at my sunflower feeder remove a seed and fly five feet directly to a knothole (hole #1) that was 6.5 feet above the ground in a vertical three-inch stem of the same lilac cluster from which the feeder was suspended. The Downy proceeded to insert the seed into the knothole, which had a hard, flat lower surface (Figure 1), and pound it open and eat the seed. It repeated this procedure five times in three minutes. The woodpecker did not hold the seed with its feet the way chickadees and titmice do when they open sunflower seeds and, in fact, did not touch the seed with its feet at any time. On March 3 I watched the same male Downy (it had a distinctive pattern of red, white, and black on its nape) make nine trips to hole #1 and six trips to a second knothole (hole #2) five feet from the feeder on a nearly horizontal stem 4.5 feet above the ground in the same lilac complex (Figure 2).

On March 7, at about 9 AM, a White-breasted Nuthatch was observed pecking and probing holes #1 and #2. The nuthatch made about ten trips from the sunflower feeder to a large sugar maple. On one occasion I observed it shuck a sunflower seed and then cache the seed in the end of a broken branch, and my impression was that most of the seeds were cached. One cached and unshucked seed, presumably cached by a nuthatch, was present in hole #2 prior to male woodpecker activity at holes #1 and #2 at about 9:30 AM, but subsequent examination showed that the cached sunflower seed had been opened and eaten. A second seed was subsequently cached in hole #1 by a nuthatch. Repeated examinations in subsequent weeks following woodpecker feeding bouts at both holes indicated that the woodpecker was eating every seed and caching none. The nuthatch(s) opened seeds and ate them, and also cached seeds, both shucked and unshucked.

By March 10, a female Downy Woodpecker, also with a distinctive head pattern making subsequent identification of this individual possible, usually joined the male in feeding on sunflower seeds and usually used hole #2 for



*Figure 1. Hole # 1 with dime for perspective.*



*Figure 2. Hole #2 with lens cap for perspective.*

shucking and eating seeds. The female occasionally used other knotholes in the lilac and had a favorite knothole on an apple tree thirty feet from the feeder. On one occasion the male was using hole #1, while the female was using hole #2.

On seven subsequent dates, the latest May 5, 1993, the two woodpeckers used a total of five holes as "vices," with the male specializing in hole #1 and the female hole #2. During this period, one male and one female nuthatch used a variety of knotholes in the lilac for caching and eating sunflower seeds. I made scattered observations in 1994 and 1995 of female and male Downy Woodpeckers and two male White-breasted Nuthatches (one banded, one unbanded) using lilac knotholes, especially hole #2, as "vices," but do not know whether the woodpeckers were the same birds as in 1993, since one or two molts had occurred that may have altered their distinctive head patterns. I never saw woodpeckers cache seeds.

I initially thought that this use of a "vice" was an example of "tool use" in birds, since they were jam-fitting seeds into appropriate-sized knotholes to immobilize them, thus freeing up their feet for grasping the lilac while husking the seeds—clearly an analog to human use of a vice. A review of the literature revealed that what constitutes "tool use" is widely debated, and that although some authorities agree on a definition, there are many behaviors that are problematic and can be argued either way.

van Lawick-Goodall (1970) defined tool use in birds as "the use of an external object as a functional extension of . . . beak, . . . or claw, in the attainment of an immediate goal." By this definition the Downy Woodpeckers and White-breasted Nuthatches are clearly using tools, since a knothole is "an external object," which acts "as a functional extension of the claws" (which are used for the same purpose as the knothole by chickadees and titmice) "in the attainment of an immediate goal" (husking the sunflower seed). This would seem to be consistent with Millikan and Bowman's (1967) conclusion that the practice of shrikes in impaling prey on thorns and other birds jamming prey into forks of branches while flaying them (using a fixed device as an extension of the body) constitutes tool use. However, van Lawick-Goodall rejects this because the bird does not manipulate the fixed object (which constrains her original definition considerably). Another major contributor to the debate, Beck (1980), concludes that to be a tool, an object has to be unattached to any object (e.g., branch) and must be manipulated by the user. By these definitions the woodpeckers and nuthatches are not using tools because the knothole is not free of the substrate, and they do not manipulate them in their beak or claws. The definitional problems get even more esoteric with distinctions between "materials" and "tools." The use of spiderwebs to help hold a nest together, for example, or "anting"—wiping feathers with ants held in its beak—would be a use of materials, not a use of tools. Even distinctions this fine become blurred in, for example, the case of a Hooded Crow, which hauled up, with its beak, a

fishing line through a hole in the ice and ate the hooked fish!

In a series of review articles, Boswall (1977, 1978, 1983) details the endless definitional struggles and presents an array of bird behaviors that, tool using or not aside, are fascinating behaviors. They include the well-known examples, generally accepted as tool use by birds, of the Woodpecker Finch of the Galapagos Islands, which uses a twig or cactus needle to probe under bark for insects, or the Egyptian Vulture, which with its beak hurls stones on ostrich eggs, and some less well-known examples including the use of feathers and other objects by Green Herons as "bait" for fish. Boswall also presents a wide spectrum of behaviors that are not generally accepted as tool use (e.g., use of "anvils" against which birds bash prey items, gulls' dropping of clams and other prey on rooftops or parking lots). Included in the latter category are a number of woodpecker behaviors analogous to the vice using of my Downy Woodpeckers and White-breasted Nuthatches. Examples include the Lewis' Woodpecker's removing bark to make a "chopping block" for prey, the Great Spotted Woodpecker's use of a vice, or the Acorn Woodpecker's hollowing out "storage holes" for acorns. It turns out that tool use among birds is very rare, and even most accepted tool use behaviors are rarely used by the birds that practice them (e.g., the bait fishing by Green Herons [Davis and Kushlan 1994]).

So, are my Downy Woodpeckers and White-breasted Nuthatches using tools or are they not? The majority of experts would most certainly say that they are not. I find it a little disconcerting, however, that when I am down in my cellar using the vice on my workbench, I am apparently not using tools.

### References

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**WILLIAM E. DAVIS, JR.**, is president of Bird Observer. Ted is professor of science at Boston University.