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## **'SHADOW-BOXING' BY A NORTHERN MOCKINGBIRD (*Mimus polyglottos*)**

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The Northern Mockingbird (*Mimus polyglottos*) is a widespread, abundant species throughout North America, Mexico, and the Bahamas (Farnsworth et al. 2011). In Florida, it is a fairly common to very common resident (Greenlaw et al. 2014). They are urban adapters (Hanauer et al. 2010) that are more abundant in urban than non-urban habitats (Tracey and Robinson 2012), and this prevalence in urban landscapes has made Northern Mockingbirds a common subject of scientific studies (Farnsworth et al. 2011).

At the Banyan Bay Apartment Complex, Coconut Creek, Broward County, between April 2015 and December 2015, I frequently observed a Northern Mockingbird that consistently perched on and 'attacked' mirrors and windshields of various cars. Around 12 November 2015, I noticed that the mockingbird had only one foot (Fig. 1a), at which point I was increasingly intrigued by this individual's behavior. Following this observation, I watched this bird more intently (nearly daily) from 12 November 2015 until 1 December 2015. This bird was very tame, allowing close approach (~2-3 m) by humans, dogs, and moving cars. Throughout this time frame, I never observed the bird outside of a 0.08 ha area within the complex. It continuously perched on multiple cars, spending more time perching on cars than any other object. It would sometimes fly into a Gumbo Limbo (*Bursera simaruba*) tree to eat berries. At times, it would stay perched on a car, continuously, for up to 30 minutes. The interesting behavior, however, was when it would attack the mirrors and windshields of cars. This behavior varied in both vigor and duration, from short (~2 s) to long (~7 s) bouts in front of the mirror. The bird would swoop down to the mirror, hovering and wing-flashing. Sometimes, hovering and wing-flashing was accompanied by the bird thrusting its feet towards its reflection (Fig. 1c), and other times pecking at its reflection (Fig. 1b). At other times, the bird would simply sit on the windshield and continuously wing-flash and peck at its reflection.

The behavior described above is defined as 'shadow-boxing', which refers to a bird that fights its own image reflected in mirrors (Ritter and Benson 1934). The term was first used in the avian literature, as far as I can tell, by Dickey (1916). This behavior has been reported in a number of species around the world, both in captivity and the wild, as reviewed by Roerig (2013); he reports four accounts of Northern Mockingbird shadow-boxing, none of which provide the sorts of details I present here. Interestingly, despite the lack of scientific references, an internet search for 'mockingbird attacking mirror' yields a multitude of images and videos of this behavior.

Wing-flashing of Northern Mockingbirds is a well-known and studied behavior (Selander and Hunter 1960, Mueller and Mueller 1971) and it is generally thought that wing-flashing is used in territorial and predator defense (Dhondt and Kemink 2008). Given the intensity and forcefulness of the shadow-boxing behavior, I hypothesize this behavior is linked to territorial defense, as in the case of the California Towhee (*Melospiza crissalis*; Dickey 1916, Ritter and Benson 1934). However, unlike the other reports, this behavior is likely not tied to nesting, given the time of year and no observation of a mate. In Florida, breeding can extend from late February until mid-late August (Farnsworth et al. 2011), an unusually long nesting season.



**Figure 1. a) Northern Mockingbird (*Mimus polyglottos*), missing a foot, perched on a car mirror at Banyan Bay Apartment Complex, Coconut Creek, Broward County, Florida. b-d) The ‘shadow-boxing’ behavior of the mockingbird, attacking its reflection in the mirror; showing wing-flashing, pecking, and feet thrusting at its reflection.**

Given the increasing human population and thereby urbanization, opportunities for these types of behaviors will continue to increase. This note highlights the need for further study of such behaviors to investigate their prevalence and any potential effects they may have on the individual birds partaking in such behaviors.

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