

**THE QUANTITY AND DISTRIBUTION OF ECHOLOCATION CLICKS
USED BY A BOTTLENOSE DOLPHIN (*TURSIOPS TRUNCATUS*)
DURING TWO DISCRIMINATION TASKS**

**Caroline M. DeLong^{1,2}, Whitlow W.L. Au¹, Paul E. Nachtigall¹,
Roland Aubauer¹, & Herbert L. Roitblat^{1,2}**

(1) Hawaii Institute of Marine Biology
(2) Dept. of Psychology, University of Hawaii

The target type, accuracy of the dolphin's response, reinforcement condition, the presence or absence of boat noise, and the number of clicks emitted by the dolphin were recorded for each trial during discrimination performance by a bottlenose dolphin (*Tursiops truncatus*). For the first task, the dolphin was required to discriminate a solid stainless steel sphere from a brass sphere, an aluminum sphere, and a nylon sphere of the same dimensions. The dolphin was also tested with a phantom stainless steel sphere, which was synthesized by convolving the dolphin's echolocation click with the target transfer function. The second task used four targets: a solid steel sphere, a brass sphere, an aluminum sphere, and a fluid-filled steel sphere. The dolphin used an average of 68.23 ± 29.86 (SD) clicks per trial with 93.33% correct choices in the first task. In the second task, the dolphin used an average of 70.72 ± 30.12 (SD) clicks per trial with 88.29% correct responses. In both tasks, the dolphin emitted more clicks on trials that ended in an incorrect response than on those ending with a correct choice. In the second task, the dolphin emitted fewer clicks when the target was steel or fluid-filled steel (means = 63.66 and 64.71) than she did for the brass or aluminum spheres (means = 79.12 and 77.36). The distribution of click quantities when the dolphin was correct was different from the distribution when she was incorrect, and the distribution of click quantities when the target type was real steel was different from the distribution of click quantities when the target type was brass. The large number of clicks and high level of accuracy suggest that the dolphin combines information from successive echoes until a confidence level is reached, rather than basing her decision on individual clicks.

Presented at *The 13th Biennial Conference of the Society for Marine Mammalogy*
Maui, Hawaii (December, 1999)