

**ACOUSTIC ANALYSIS OF OBJECTS ENSONIFIED BY A BOTTLENOSE DOLPHIN
(*TURSIOPS TRUNCATUS*) DURING A CROSS MODAL MATCHING TASK**

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A bottlenose dolphin performed a matching task in which he was presented with an object (e.g., tin cup) in one modality (e.g., vision) and then asked to choose the same object from a group of three objects using another modality (e.g, echolocation) or the same modality (e.g., vision). Object sets were presented in two cross-modal conditions (visual sample with echoic choices or echoic sample with visual choices) and two intra-modal conditions (visual sample with visual choices or echoic sample with echoic choices). Acoustic measurements of the objects were made to evaluate how the dolphin used the multiple cues that were available in the echoes to perform the task. Objects were ensonified by dolphin-like clicks from several different angles and the signals were captured and digitized (objects were aspect-dependent, thus producing different echoes at different angles). The pattern of errors made by the dolphin in the echoic-echoic condition revealed that the dolphin appeared to use the following properties of the echo signals to discriminate among objects: variations in echo highlight structure as a function of angle, variations in echo intensity as a function of angle, and absolute echo intensity. The dolphin seemed to use different cues for different object sets, which suggests he may have utilized the most optimal cue(s) available for each object set.

Pacific Science, 56(1), 86-87.