

OBJECT RECOGNITION IN THE BOTTLENOSE DOLPHIN: HOW VISION AND ECHOLOCATION INTERACT

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Bottlenose dolphins can recognize objects across modalities, i.e., given a sample object visually or echoically, a dolphin can identify that object from among a group of alternatives in the second modality (echoic or visual, respectively). Dolphins may be able to perform this task, because (1) they can learn to associate their visual and echoic experiences of an object; (2) they can recognize an equivalence between their visual and echoic experiences through the detection of object features that are available to both modalities. Data from a bottlenose dolphin performing a 3-alternative cross-modal matching task in which identical (Object A to Object A) or conditional (Object B to Object C) matches were reinforced suggest that the dolphin can perform this task based on a recognition of equivalence between his visual and echoic experiences; the dolphin consistently matched based on object identity regardless of reinforcement for conditional matches. Data with object sets that varied on a single dimension (i.e., shape, texture, material, size) suggest that some object features are easier to discriminate than others in a cross-modal task. The dolphin's strengths and confusions shed light on its object recognition system.

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