

The Localization of Single and Multiple Source Stimuli by Cats

Micheal L. Dent, Daniel J. Tollin, Tom C.T. Yin *Department of Physiology, University of Wisconsin-Madison, Madison, WI*

Behavioral studies of sound localization in cats have shown that these nocturnal predators can be trained using operant conditioning methods to accurately saccade to broadband sounds delivered in anechoic spaces from single locations in space (e.g., Populin and Yin, 1998). Little is known, however, about localization accuracy in more natural, echoic environments. We have previously demonstrated that cats appear to experience both the precedence effect and summing localization: they saccade to the leading sound when two similar sounds are presented with a short (1-10 msec) interstimulus delay from two different locations in space and they saccade between the two sounds when the delays are short (<300 usec) . Here, we examine several factors thought to be important in the precedence effect. First, we show that the spatial locations of the leading and the lagging stimuli can affect the apparent location of the auditory image. Second, we show that when the stimuli are delivered with zero delay, intensity differences alone between two stimuli can elicit localization dominance. Third, conflicting intensity and time differences between the two stimuli can influence localization performance. Finally, paired stimuli known to elicit a phenomenon known as the Franssen Effect in humans are also successful in eliciting the illusion in cats, especially when the stimuli are at frequencies where cats are less able to accurately localize single sounds. As a whole, these results add to what is known about the localization of simple and complex stimuli in cats and provide the basis for future physiological studies of these sound localization phenomena. Supported by NIDCD DC00116 and DC02840