

Behavioral Measures of Auditory Scene Analysis in Birds

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Although laboratory experiments on hearing in animals generally begin with studies of absolute sensitivity in quiet environments, the reality of an animal's life is that it is rarely communicating in that type of sterile situation. There are auditory studies that more closely approximate ecologically-relevant conditions of an animal's life, such as discrimination, localization, and masking experiments, but even those can have limitations. Studies on complex sound perception in birds have utilized various techniques to describe how well animals can effectively communicate in noisy environments with multiple sound sources. Birds can be trained using operant conditioning procedures to peck keys for food reinforcement in a variety of tasks. Cocktail party experiments have demonstrated that hearing a signal in noise is easier when these stimuli are segregated spectrotemporally and spatially. Auditory scene analysis experiments have demonstrated that timing, location, and spectral content all have an influence on whether stimuli are streamed or segregated by the listener. Recent evidence supports streaming build up in birds, as in humans. Together, these experiments suggest that the parsing of the acoustic scene is a basic auditory process used by many animals to aid in signal detection under difficult and complex listening situations.