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Knowing their enemies: individual vocal signatures used by northern elephant seals in male contests

Vocal signals emitted by many species contain diverse information about the emitter (social status, identity, RHP). Understanding if and how receivers decode information from signalers is a major topic in animal communication. Individual vocal signatures have been investigated in mammals with particular attention to mother-offspring recognition, but rarely among adults. During the breeding season, male-male interactions are frequent, and thus knowing the identity of the rivals can be beneficial since the costs of physical challenges are extremely high. An ideal mammalian model to study this topic is the northern elephant seal *Mirounga angustirostris*. Males face strong intra-sexual competition for access to female harems, and social status is established through physical challenges at the beginning of the breeding season. The maintenance of dominance among males is mediated by ritualized displays including loud vocalizations. We previously showed that males do not use phenotype-linked acoustic cues in rival assessment, but instead learn to recognize their rivals individually through the use of a time-stable individual vocal signature. Analyses of these signature calls showed several individual-stereotyped acoustic features, with the pulse rate and the centroid of the frequency spectrum serving as the main features characterising the unique acoustic space of each individual. Here, we investigated whether males effectively used these parameters to discriminate their rivals, by performing playback experiments with acoustic displays in which one of these two characteristics was systematically modified. We tested 10 adult males, and found that while small modifications of the pulse rate or of the spectral centroid ($\pm 28\%SD$) did not alter individual recognition, substantial modifications ($> 115\%SD$) strongly impaired identification. Males used both of these individually stereotyped acoustic features to identify their rivals, and it seems that males may be more sensitive to spectral than temporal features.