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Title - Vocal communication in male northern elephant seal competitive interactions: honest signals or learned associations? Caroline Casey, Colleen Reichmuth, and Brandon L. Southall, *Institute of Marine Sciences, Long Marine Laboratory, University of California Santa Cruz, CA, USA*. Isabelle Charrier, *Equipe Communications Acoustiques, Université Paris Sud, Orsay, France* and Nicolas Mathevon, *Laboratoire de Biologie Animale, Université Jean Monnet, Saint-Etienne, France*

Northern elephant seals (*Mirounga angustirostris*) have a highly polygynous breeding system in which adult males establish dominance hierarchies that determine access to females. Acoustic signaling plays an important role in settling otherwise costly interactions between competing males, as stereotyped vocal displays often elicit appropriate behavioral responses from spatially separated individuals without physical contact. This study examined the acoustic characteristics and function of these displays to better understand how vocal cues mediate competitive interactions. More than 150 sub-adult and adult male elephant seals were individually identified and observed during two consecutive breeding seasons at the Año Nuevo Rookery in San Mateo County, California. Dyadic behavioral events, body size parameters, and GPS locations were repeatedly sampled for focal males, and their vocal displays were digitally recorded and analyzed for spectral, temporal, and amplitude characteristics. Different individuals had obvious vocal signatures. To determine whether these calls were sufficient to control the behavior of receivers, two field playback experiments were conducted using calls recorded from individuals of known size, rank, and familiarity directed toward dominant and subordinate associates. The results show strong and predictable differential phonotaxis consistent with relative hierarchical status. To determine whether the vocalizations were merely honest indicators of resource holding potential, call qualities reflecting duration, level, and frequency were evaluated for dependence on body size and rank. The absence of significant correlations supports the suggestion of Shipley *et al.* [Anim. Beh. 29(1), 12-19] that the outcomes of vocal challenges cannot be predicted on the basis of call parameters alone. The complex and individually unique acoustic signals of male northern elephant seals may not be honest indicators size or dominance but rather serve as vocal signatures which males use to identify one another through learned associations.

Preference: talk