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Directionality of male northern elephant seal (*Mirounga angustirostris*) threat calls and how it influences receiver behavior.

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Many animal sounds are directional in which the sound energy is focused in a direction that depends on the signaler's orientation. In the 1970s, Ron Schusterman quantitatively showed this in barking California sea lions and dogs. Several investigators have suggested ways that such features might be particularly useful among individuals in acoustic communication networks. However, only a few have tested such hypotheses experimentally and even fewer have investigated how directional signals affect receiver behavior. In this study, we measured directivity patterns of male northern elephant seal threat calls and used an acoustic playback approach to determine how call directionality influenced the responses of male seals in reproductive competition. We collected data on adult and older subadult seals on a breeding rookery (Ano Nuevo State Park) over three field seasons. Threat calls had substantial directionality, particularly at frequencies above 1 kHz and responses to playbacks depended on call directivity patterns. Males moved farther away from the playback source when it simulated a caller oriented toward them compared to when playbacks simulated a caller oriented away from them. These results suggest that threat call directionality provides meaningful information about the auditory scene and spatial orientation of male elephant seals in reproductive competition.