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Acoustic production mechanisms in pinnipeds

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The ability to develop articulate speech relies on capabilities that became available to our ancestors through changes in both peripheral mechanisms (vocal acoustics and anatomy) and neural mechanisms (vocal control and imitation). Few distantly related species (cetaceans, birds and pinnipeds) have shown the ability of vocal imitation, but of the three, only the pinnipeds use the same vocal tract as us humans. For this reason we choose to study two closely related pinniped species: the Harbour Seal (*Phoca Vitulina*), a good vocal imitator (capable of complex vocal learning), and the Californian Sea Lion (*Zalophus californicus*), a close relative with very limited vocal imitation capabilities (no evidence of complex vocal learning) to look at the acoustical production mechanisms of the species as well as the neural mechanisms underlying the same. Using previously acquired data gathered in California at the Long Marine Lab, we performed video and acoustic analysis to show correlation between jaw opening and formants frequencies in the Harbour Seal (*Phoca Vitulina*), in speech like vocalisations. We are examining the involvement of tongue movement during these vocalisations, hypothesising that it will account for the remaining residuals in the correlation between the formants excursions and the jaw movements.