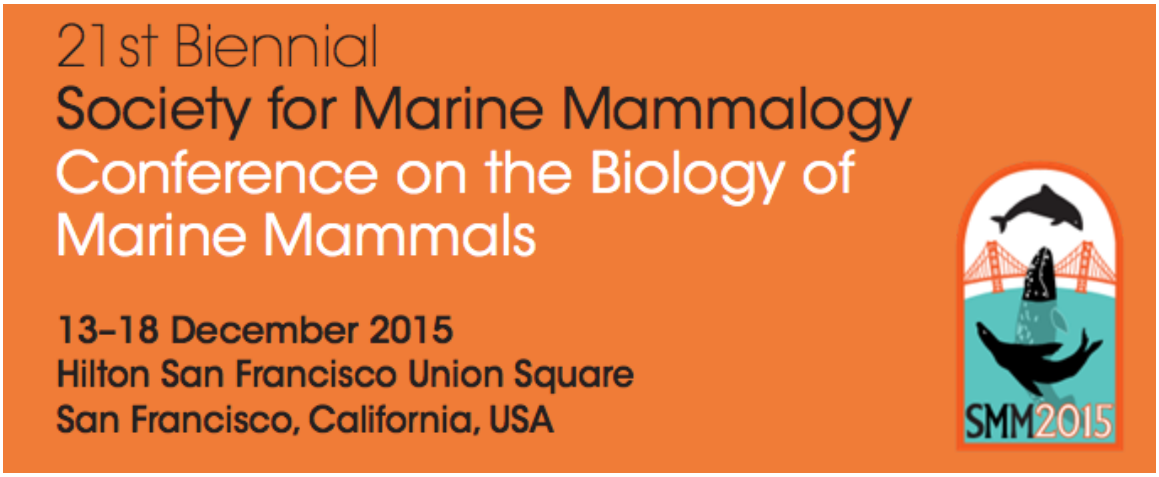

2015. Rouse, A., Cook, P., and Reichmuth, C. A California sea lion shows human like beat-keeping in response to changing phase and tempo. *21st Biennial Conference on Marine Mammals,* San Francisco, United States, 13 December – 18 December. (Presentation abstract).

A California sea lion shows human like beat-keeping in response to changing phase and tempo

There is increasing interest in the ability of animals to find and follow rhythms. Long thought to be a uniquely human ability, the capacity to entrain motor movements to rhythmic auditory stimuli has recently been demonstrated in a small number of non-human species. While studies of rhythmic behavior have historically been limited to human experiments and behavioral simulations, a comparative approach now offers the potential for animal models of rhythm entrainment to illuminate the evolutionary origins of this ability. To date, some of the best beat-keeping performances come from a California sea lion (*Zalophus californianus*), Ronan, who was trained to successfully find and follow external auditory rhythms. This individual demonstrated a robust ability to entrain to novels tempos and stimuli with precision not previously shown outside of humans [Cook et al. (2013) J. Comp. Psychol. 127, 412-427]. However, the neurobiological and cognitive mechanisms that enable this ability in the sea lion are presently unknown and strongly debated. To enable direct comparisons to more thoroughly studied human subjects, we conducted an additional fine-scale examination of beat keeping performance in this sea lion. Here we report her ability to adapt to changes in the rhythmic features of sounds. We shifted tempo and phase by increments of ±3, 8, and 15% during the motoric entrainment task (head bobbing) and compared her ability to detect and compensate for these changes with prior data from human subjects performing a similar task (finger tapping). Ronan was able to quickly return to in-phase beat-matching following all perturbations, and the dynamics of her response patterns were unaffected by baseline stimulus tempo. Her data mirror findings for humans, providing further evidence that the neurobiological mechanisms of human beat keeping may be broadly conserved across species.