SEEWIESEN

LECTURE SERIES

FALL/WINTER 2019/20

Max Planck Institute for Ornithology

MAX PLANCK GESELLSCHAFT

THURSDAY | March 26th, 2020 | 13 P.M. | HOUSE 4 LECTURE ROOM

FRÉDERIC THEUNISSEN

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Auditory memories and vocal communication in zebra finches

Songbirds need to form auditory memories not only of the tutor song for vocal imitation but also of many songs and calls of conspecifics for individual recognition. We know that songs and calls have idiosyncratic acoustical features and that birds can use these features to recognize specific individuals. In recent work, we have tested the memory capacity of zebra finches for caller ID based on songs and calls and found it to be impressively large: within one-week zebra finches are capable of recognizing ~16 individuals based on their song or distance call. The upper memory capacity of songbirds might actually be much higher, but it is difficult to assess in a laboratory experiment. Combining brain lesions and neurophysiological recordings, we have assessed the role of secondary auditory pallial areas NCM and CMM in memory formation and storage. We found that NCM plays an important role in these perceptual tasks. In future work, we plan on determining to what extend the auditory memories used for individual recognition in communication overlap with the auditory memories that songbirds use for vocal imitation.

WHO IS FRÉDERIC THEUNISSEN?

2019-now	Professor, Psychology, Neurosciences and Integrtive Biology, UC Berkeley.
2010-2019	Professor, Psychology and Neurosciences Institute, UC Berkeley.
2005-2010	Associate Professor. Psychology and Neurosciences Institute. UC Berkeley
1998-2005	Assistant Professor. Psychology and Neurosciences Institute. UC Berkeley.

SELECTED PUBLICATIONS

- Elie JE and F.E. Theunissen. "Time-varying information and the neural coding of communication calls". Plos Comp Biol (2019)
- Elie JE and F.E. Theunissen. "Zebra finches identify individuals using vocal signatures unique to each call type." Nature Communication 9(1): 4026. 2018
- De Heer, W. A., A. G. Huth, T. L. Griffiths, J. L. Gallant and F. E. Theunissen. "The Hierarchical Cortical Organization of Human Speech Processing." Journal of Neuroscience 37(27): 6539-6557. 2017
- Elie, J. E. and Theunissen FE. The vocal repertoire of the domesticated zebra finch: a data-driven approach to decipher the information-bearing acoustic features of communication signals. Anim Cogn 19(2): 285-315. 2016
- Elie, J. E. and Theunissen FE. Meaning in the avian auditory cortex: neural representation of communication calls. The European journal of neuroscience 41(5): 546-567. 2015

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