

SEEWIESEN

LECTURE SERIES

FALL/WINTER/SPRING 2020/21

Max Planck Institute
for Ornithology

MAX PLANCK
GESELLSCHAFT



THURSDAY | January 14, 2021 | 13.00 | ONLINE

LENA VEIT

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Songbirds can learn flexible contextual control of syllable sequencing

The flexible control of sequential behavior is a fundamental aspect of speech, enabling endless reordering of a limited set of learned vocal elements (i.e. syllables or words). Songbirds are phylogenetically distant from humans, but share the capacity for vocal learning as well as neural circuitry for vocal control that includes direct cortical-brainstem projections. Based on these similarities, we hypothesized that songbirds might likewise be able to learn flexible, moment-by-moment control over vocal production. Here, we demonstrate that Bengalese finches, which sing variable syllable sequences, can learn to rapidly modify the probability of specific sequences (e.g. 'ab-c' versus 'ab-d') in response to arbitrary visual cues. Moreover, once learned, this modulation of sequencing occurs immediately following changes in contextual cues and persists in the absence of external reinforcement. Our findings reveal a capacity in songbirds for learned contextual control over syllable sequencing that parallels aspects of human cognitive control over speech

WHO IS LENA VEIT?

- 2010 – 2015 PhD Student, (Andreas Nieder lab)
University of Tübingen
- 2016 – 2020 Postdoc, (Michael Brainard lab)
University of California, San Francisco, USA
- 2020 – present Junior Professor, Institute of Neurobiology
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SELECTED PUBLICATIONS

- Veit L, Pidpruzhnykova G, Nieder A (2017) Learning Recruits Neurons Representing Previously Established Associations in the Corvid Endbrain. *J Cogn Neurosci* 29(10),1712-1724.
- Veit L, Pidpruzhnykova G, Nieder A (2015) Associative Learning Rapidly Establishes Neuronal Representations of Upcoming Behavioral Choices in Crows. *PNAS* 112(49), 15208-13
- Veit L, Nieder A (2013) Abstract rule neurons in the endbrain support intelligent behaviour in corvid songbirds. *Nature Communications* 4:2878, doi: 10.1038/ncomms3878.
- Veit L, Aronov DX, Fee MS (2011) Learning to breathe and sing: Development of respiratory-vocal coordination in young songbirds. *Journal of Neurophysiology* 106(4), 1247-65
- Aronov DX, Veit L, Goldberg JH, Fee MS (2011): Two distinct modes of forebrain circuit dynamics underlie temporal patterning in the vocalizations of young songbirds. *Journal of Neuroscience* 31(45), 16353-68
- Preprint: Veit L, Tian LY, Hernandez CM, Brainard MS (under review): Songbirds can learn flexible contextual control over syllable sequencing. *bioRxiv* <https://doi.org/10.1101/2020.08.05.238717>

LINK TO TALK

<https://gwdg.zoom.us/j/88111616875?pwd=dGJlK2kxbzE1NWErK25tdkZmSEV3dz09>
Meeting-ID: 881 1161 6875
For code please contact:

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