

Title: Male songbirds turn off their self evaluation system when they perform for females

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Abstract: Attending to mistakes while practicing alone provides opportunities for learning, but self-evaluation during audience-directed performance could distract from ongoing execution. It remains unknown how animals switch between practice and performance modes, and how evaluation systems process errors across distinct performance contexts. We recorded from striatal-projecting dopamine (DA) neurons as male songbirds transitioned from singing alone to singing female-directed courtship song. In the presence of the female, singing-related performance error signals were reduced or gated off and DA neurons were instead phasically activated by female vocalizations. Mesostriatal DA neurons can thus dynamically change their tuning with changes in social context.

Short Biography: Jesse received his B.S. from Haverford College and his MD/PhD degrees from Columbia University. His PhD with Rafa Yuste focused on dendritic computation and microcircuits of the cerebral cortex. In medical school, he became interested disorders such as Parkinson's and dystonia that impair basal ganglia dependent reinforcement learning. His postdoctoral work at MIT focused on how the basal ganglia implement reinforcement learning (RL) in juvenile songbirds. His lab combines high channel count awake-behaving electrophysiology, closed-loop optogenetics, and machine learning-guided behavioral analysis to study how animals learn through practice. His guiding philosophy is that comparative approaches (across species and across the animal-machine divide) are necessary to distinguish general principles from behavior-, effector-, machine- and species-specific solutions to motor learning problems.