Vocal Learning Beyond Imitation: From Cultural Evolution to Brain Dopamine

Studies of vocal learning in songbirds typically focus on the acquisition of sensory templates for song imitation and on the consequent process of matching song production to templates. However, functional vocal development also requires the capacity to adaptively diverge from sensory templates. Recent studies suggest that vocal learning mirrors tradeoffs between the assimilation of group identity (culture) while establishing individual and flexibly expressive songs. To study functional outcome of vocal development, we measure, in controlled environments, how social context can affect the outcome of song development. We then assess how those changes may affect song potency by measuring, in awake birds, how playbacks of song that vary in their social context affect brain dopamine levels. Results provide clues to how reinforcement is gated by social factors in males who acquire songs, and in females who select males by their songs.