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RESPIRATORY MOTOR CORRELATES OF SONG PLASTICITY IN YOUNG ADULT ZEBRA FINCHES.

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Young adult zebra finches (*Taeniopygia guttata*, 90150 phd) sing a stereotyped song, but can show rapid changes in song structure if sensory feedback is disrupted. The vocal motor correlates accompanying induced song plasticity have not yet been examined. To investigate motor changes underlying song plasticity, air sac pressure and vocal output were recorded in zebra finches (N=4, 90-120 phd) prior to, during, and after removal (reversal) of a clamp placed in each bronchus. The clamp restricted movement of the lateral labia and reduced, or completely eliminated, sound production during song. In the first 7 days with the clamp in place, the respiratory pattern of the motif was unchanged while phonation was greatly reduced. Sound density (SDEN), the percentage of time birds vocalize during expiration, was reduced from an initial 80% to 10% one week after muting. After 7 days of partial muting, all birds changed their respiratory pattern (novel, but fewer expiratory pulses, shorter average pulse duration, and stuttering). These respiratory changes occurred in 3 birds that were able to generate sound (SDEN = 75% at 30 days) and in one bird that was completely muted (SDEN = 0% at 30 days). Thirty days after reversal, the bird, which did not vocalize, recovered its original respiratory pattern and song. In contrast, birds with high SDEN during muting retained their modified respiratory pattern and song. Induced song plasticity in young adult zebra finches leads to the generation of novel, stereotyped vocal motor gestures. Maintenance of these motor patterns after reversal may depend on auditory feedback during manipulation of the song system.

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