White - crowned sparrows tutored with syllable pairs can produce full songs.

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During their 'sensitive period', young songbirds develop an 'acquired template', representing a memory of the song(s) that it hears. Later, during the sensorimotor phase, birds use this template to evaluate, via auditory feedback, their vocalizations. The neural basis of the acquired template is incompletely understood. It appears unlikely that an experience-shaped array of single-syllable detectors sufficiently constitutes a template; birds that have heard all syllables present in adult song but in temporal isolation from one another produce mostly single-syllable songs (Soha & Marler, 2001). Alternatively, the template might consist of 'combination-sensitive' neurons that act as detectors for syllable pairs. To test this hypothesis, we tutored white-crowned sparrows with isolated syllable pairs taken from adult conspecific songs consisting of five syllables. One group of sparrows was tutored with 'forward-order' (normal) pairs, while a second group heard only reverse-order pairs. The reverse tutoring was performed to test whether there is an innate predisposition to assemble song in a stereotyped temporal arrangement. Birds tutored with forward-order syllable pairs were able to assemble songs that matched the wild-type songs; sparrows tutored with reverse-order syllable pairs also produced complete songs, but syllables were arranged in reverse order. These results show that exposure to complete song during tutoring is not required for the development of normal song, and are consistent with the idea the acquired template consists of a population of 'syllable-pair detectors'. In the early plastic song phase, birds of both groups produced predominantly syllable pairs; pairs either matched those in the stimulus ensemble (forward or reverse order) or were novel combinations. The subsequent trajectories of song development in these birds will be presented.

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