

Study in birds suggests method of learning affects how the brain adds neurons

October 23 2006

Teaching may be the world's most noble profession. But new research from Fernando Nottebohm's Rockefeller University laboratory shows that, in birds, the presence of a teacher may actually limit mental flexibility.

Thirty days after they are born, male zebra finches start to imitate and learn their song from other males. For the next 35 days many new neurons are added to the vocal center of the brain. After day 65, however, this addition of new neurons severely drops as their imitation is perfected; after that, no new songs are learned.

But Nottebohm's lab found that this is not the case in males raised in isolation — they continue to robustly add new neurons for up to 90 days after they first start singing, and their improvised song remains more variable.

“Juvenile zebra finches reared with adult males have a sensitive period from post-hatching day 30 to day 65,” says Nottebohm. “We wanted to know if we could extend that period for song learning and if in doing that the amount of new neuron recruitment was also affected. When the birds were raised in visual or auditory isolation, they maintained the ability to improvise their song for much longer and new neurons continued to be added after the expected sensitive period had ended.” The birds could also imitate songs they heard for the first time after day 65.”

“It may be that when birds successfully imitate a song they hear from a tutor there is a ‘mission accomplished’ signal that then blocks any additional changes,” says Nottebohm. “But without a teacher, the birds in isolation don’t get this kind of signal because they have to improvise, leaving the door open for additional changes in behavior and neuronal turnover.”

Studies of this kind, looking at the variables that affect new neuron addition, provide an opportunity to relate the addition and elimination of cells to changes in natural learned behavior, holding clues to how humans, and other animals, acquire long-term memories.

Citation: *Journal of Neuroscience* 26(36): 9135-9141 (September 6, 2006)

Source: The Rockefeller University

Citation: Study in birds suggests method of learning affects how the brain adds neurons (2006, October 23) retrieved 24 April 2024 from <https://phys.org/news/2006-10-birds-method-affects-brain-neurons.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.