Abstract Submitted
for the MAS14 Meeting of
The American Physical Society

Adaptation in variable action sequences JASON D. WITTENBACH, DEZHE Z. JIN, Pennsylvania State Univ — Sequential behavior is seen throughout the animal kingdom. Often times the actions that comprise a sequential behavior can be placed in different orders within the sequence, creating a variable action sequence. Examples of variable actions sequence range from the simple grooming patterns of mice to the complex patterns and rules of human speech. Understanding how neural circuits can encode and generate the patterns seen in such variable action sequences is an important step in unraveling how the brain generates complex behavior. One popular model system for studying variable action sequences is the Bengalese finch - a songbird with a complex and variable song. The Bengalese finch song exhibits repetition adaptation: a phenomenon where repeated elements become less likely to continue repeating the longer the repetition continues. We propose a model for the neural circuit that the Bengalese finch uses to produce the patterns of its song. This model reproduces the previously unexplained repetition adaptation. We also present a simplified dynamical system that shows how many systems with slowly changing parameters can exhibit a similar phenomenon.

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Date submitted: 28 Aug 2014 Electronic form version 1.4