Motor Sequence Learning Experiment
PSY310: Lab in Psychology
Lab Report

October 2, 2025

Devanshi Patel
AU2320061

GitHub link:

https://github.com/devanship-stack/PSY310

Introduction

Psychology defines learning as the process of a relatively permanent change in behavior or knowledge that results from experience (OpenStaxCollege, n.d.). It is also a fundamental cognitive process, and the interface between various outcomes, or contingency, appears to be relevant when it comes to the learning process. Contingency affects learning in a variety of ways, one of which is sequence learning, in which learners identify and learn about sequences (Abrahamse et al., 2013). Contiguity is best illustrated by sequence learning, in which people note patterns and subsequent events and factors that connect them (Cleeremans & McClelland, 1991).

In the Motor Sequence Learning experiment, participants are trained to recognize and anticipate specific patterns or sequences, evaluating their ability to acquire and retain sequential information to understand learning processes. The experiment thus helps in investigating how individuals acquire, retain, and generalize sequential information, shedding light on cognitive processes involved in skill development and memory consolidation.

Method

Participants

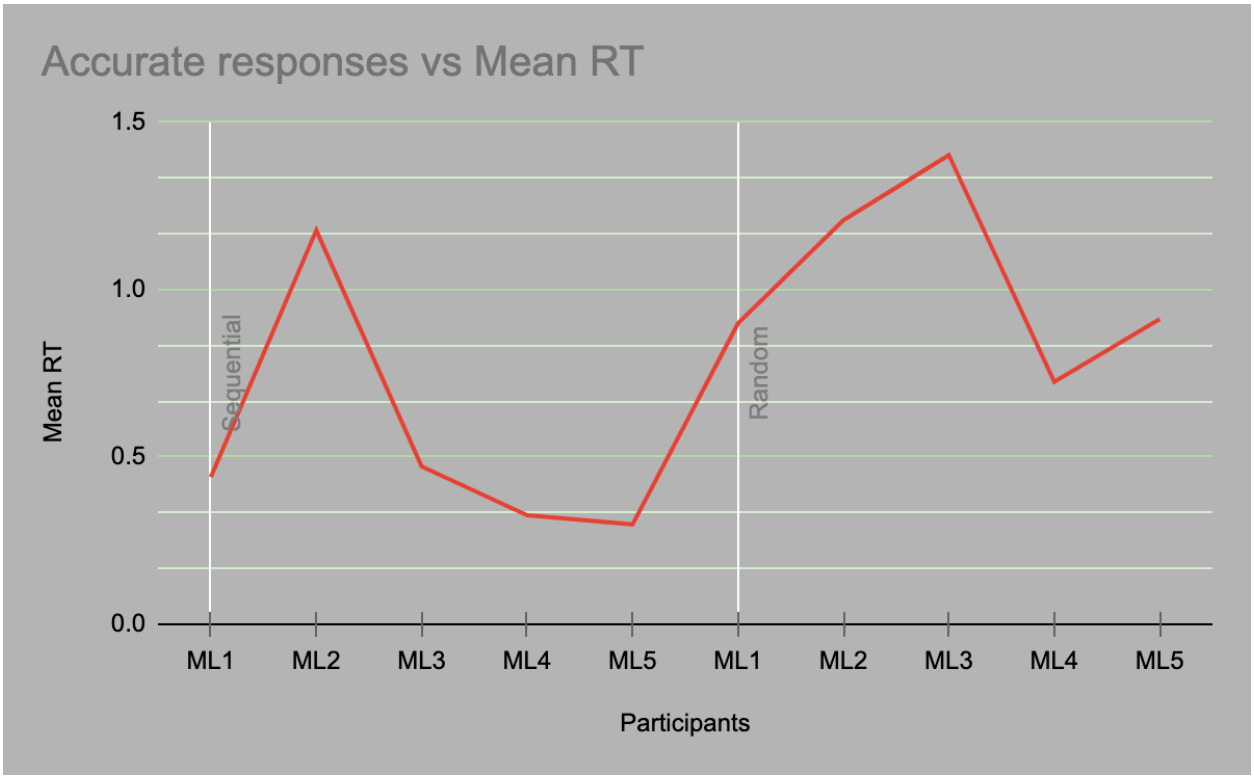
A group of five undergraduate students of Ahmedabad University from the age of 18-20 were taken as participants. They were informed about the experiment's objective, and were briefed about the procedure, which was to understand the cognitive processes involved in acquiring, retaining information, and using it to anticipate new information.

Materials and Procedure

This Motor sequence learning experiment was created using PsychoPy3 Experiment Builder (v2021.2.3), on a desktop window with a resolution of 1440 x 900 pixels. 800 trials of the experiment were conducted, per participant.

In the experiment, a predetermined set of stimuli were shown in either a random or prearranged sequential order for each trial. Four bars made up the stimuli, and one of them briefly had a triangle displayed on top. Each bar corresponded to a set of keys on the keyboard- 'z', 'x', 'c', and 'v'. As soon as the participants detected the triangle, they were instructed to react as quickly as possible. The average reaction time (RT) for each trial was used to calculate how long it took each participant to respond. There were two primary conditions for the task: 1) fixed sequence of allocation; 2) random. While the allocation sequence was altered between trials in the second condition, it remained constant during the first condition's trials.

Results



As per the data collected, we found that:-

The mean RT for all the sequence trials is 0.542417177

The mean RT for all the random trials is 1.028843603

We can see that the sequence reaction time is lesser than the random response time.

Discussion

Participants' reaction times would be quicker in trials where they could predict what would happen next than in random trials, where participants have to use more mental energy to solve the tasks sequentially, which always results in longer reaction times. The results show that the sequence condition had a shorter reaction time than the random condition. We can also find that the participants have higher contingency for sequential than random trials, as we know that the contingency is inversely proportional to the reaction time.

References:

Abrahamse, E. L., Ruitenberg, M. F. L., De Kleine, E., & Verwey, W. B. (2013). Control of automated behavior: insights from the discrete sequence production task. Frontiers in Human Neuroscience, 7. https://doi.org/10.3389/fnhum.2013.00082

Cleeremans, A., & McClelland, J. L. (1991). Learning the structure of event sequences. Journal of Experimental Psychology General, 120(3), 235–253. https://doi.org/10.1037/0096-3445.120.3.235