Tutorial 4: Sequence Learning Experiment

PSY310: Lab in Psychology

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GitHub link:
https://github.com/SmitinambiarAU/experiments.git

Introduction:

A Sequence Learning Experiment is a type of experimental study that helps us understand how people learn sequential patterns and how they learn about the regularities and contingencies in a series of events, stimuli, or actions.

In a sequence learning experiment, the participants are shown a sequence of events i.e. cues, symbols, or any other stimuli. So, by manipulating the contingency of the sequences the researchers study how participants learn and memorize the sequence of events.

The learning and contingency are nearly related wherein psychologists learn to understand how individuals familiarize themselves with the patterns or sequence of events. Learning is gathering information and knowledge through experience, practice, or openness to stimuli whereas Contingency is the degree of predictability or constancy in the sequence of events or stimuli. In learning, the participants predict the patterns or cues that can be unconscious and conscious.

Method

Participants:

As a part of PSY 310 Lab in Psychology at Ahmedabad University only one participant 20 years old is a female.

Materials:

The experiment was performed on Psychopy software (2023.2.1) on a standard HP laptop. The stimuli consisted of a series of shapes in black and white versions in a fixed and random sequence. There are three unique shapes i.e. rectangle and triangle and one distinct color i.e. red and orange between each trial used in the experiment.

Procedure:

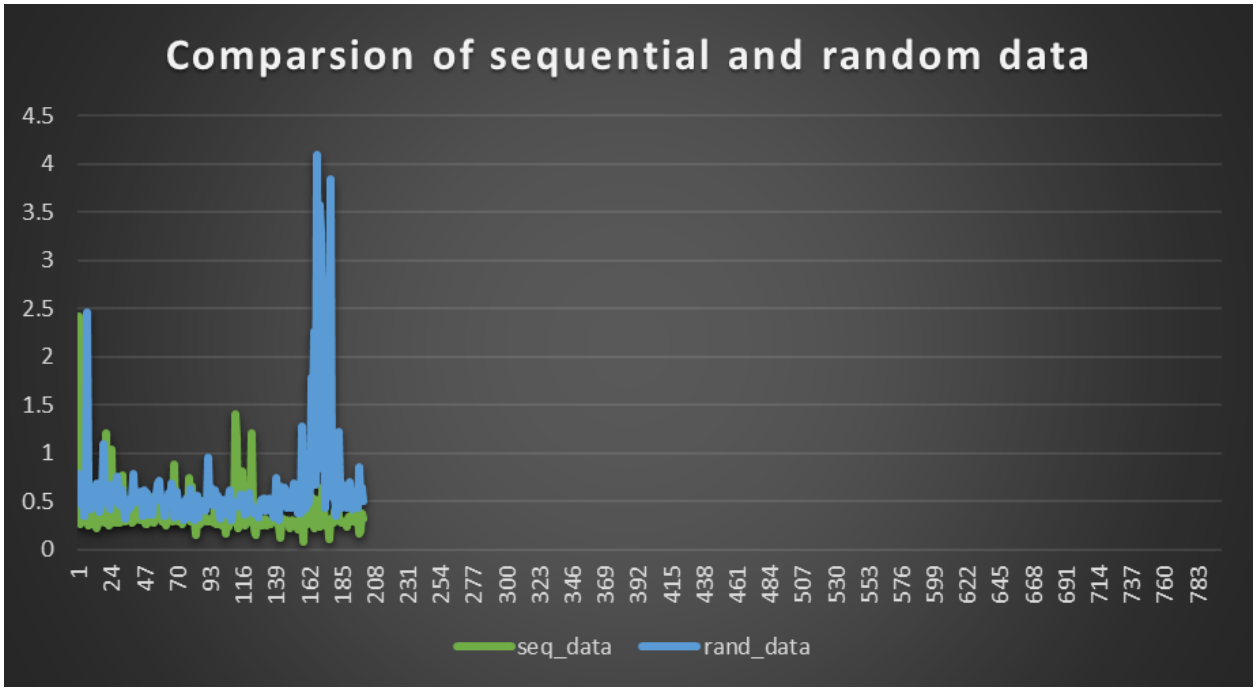
There was only one participant involved in this sequence learning experiment wherein the individual was informed about the purpose of the experiment which was to find how individuals learn and memorize the sequential patterns and about the regularities and contingencies in a series of events, stimuli, or actions. Participants were given detailed instructions regarding the sequence learning task. They were instructed that they would be presented with a sequence of

trials wherein there would be four rectangles and on the top center a shape would appear from time to time in different positions.

The main task consisted of a fixed sequence and random trials of 200 trials. On each trial, a shape was presented on the screen and the participant had to predict the shape in the sequence by pressing a designated key i.e. in my context it was four rectangles so the [Z, X, C & V]were the respectable keys. The data was then collected in the Excel sheet named " sequence learning". The center fixation cross was 10 × 10 pixels in size and the time duration was 1.0 seconds. The cross fixation was added i.e. the four thin rectangles set at 90 degrees vertically.

Results:-

The mean reaction time for both sequential and random conditions in this experiment is **0.35 and 0.64** respectively. The graphical representation of the mean difference in RT between sequential and random conditions is as follows, where the graphs show the changes in RT across trials.



Discussion:

In the sequential condition the participant was presented with a structured and predictable sequence of stimuli in this condition it was the triangle appearing above the four rectangles. In this experiment, the participants got familiarized with the pattern and started responding to the stimuli faster which led to a shorter reaction time. In random conditions, the participant were presented with a random and unpredictable manner of stimuli. Due to this the participants were unfamiliar with the pattern and took more time to predict . Thus, the reaction time was longer . The counterbalancing can help participants to experience first the sequential and then the random condition wherein it can help to control order-related biases and can improve the quality and validity of any study.