Lab Report

Aayushi Mehta AU2020057

Introduction

Staircase method is also called up-down method when using absolute thresholds, a variable stimulus is repeatedly presented and its intensity is adjusted upward when it is not perceived and downward when it is. For difference thresholds, a variable stimulus is changed to be greater different from a standard stimulus in absolute terms when the difference is not detected, and less different from the standard stimulus when the difference is. Positive reactions cause the stimulus level to gradually drop starting at a level over the threshold until a negative response happens. As a result, the track's orientation is reversed, and levels rise on consecutive trials until the next change in reaction. The level at which the track would progress up or down on the stimulus axis with equal probability is the stimulus level that the track targets, or, alternatively, the level at which the likelihood of a correct response and the probability of a wrong response are equal.Other methods of measuring stimulus threshold are Bayesian and maximum-likelihood procedures, Magnitude estimation, method of limits, method of stimulation, and method of adjustment. 180*

Method

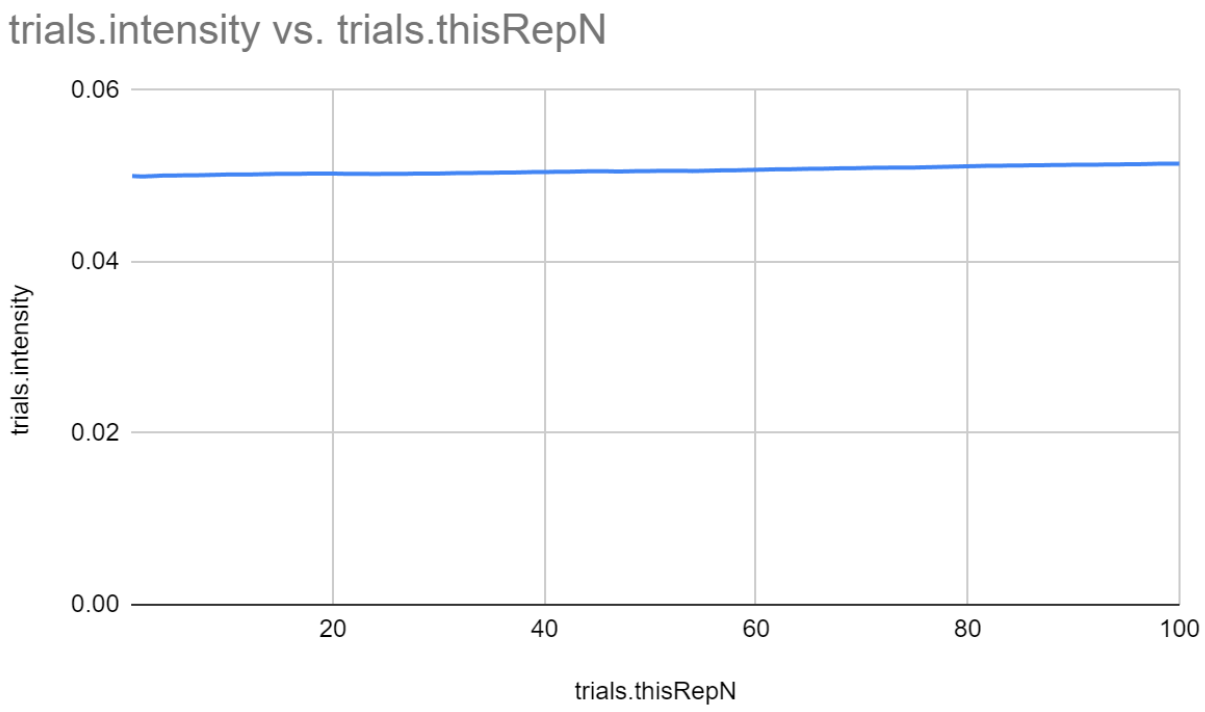
Performing titration procedure using adaptive staircase method on psychopy. In order to titrate for the contrast of a visual grating, finding optimum contrast level. The grating appears on either the right or left side and the task is to press a left arrow key. A mistake in the answer leads the contrast levels to go up, and a correct response leads contrast levels to go down.

Steps are as follows: Add static function from custom category on the right side in psychopy software. It helps you add a printer stimulus interval.Add time as 0.0 and duration as 1.0. This is an inter stimulus interval of 1. Second at the beginning of the trial. Next add a fixation, fixation would be a polygon. Add from the stimuli category on the right side. The shape of the polygon is going to be a cross. Time 1.0 and duration 1.0. It should appear after the inter stimulus interval and should stay there for one second. Go to layout and change spatial units to pixels, change contrast to set every repeat from the dropdown besides spatial units and anchor position to be center. Change the size to 10 by 10. Make sure to uncheck the box of save onset/offset time in data from properties. Next add grating from the stimuli category on the right side..Change time in properties pop up to 2.0s to duration as 0.3s.Change size from layout to (0.1, 0.1), change the position to $location. Go to texture and change mask to circle and make spatial frequency to 5.

Next , to add responses add a keyboard component from the right side on psychopy. Change time to 2.0s and allow keys to ‘left’, ‘right’. Go to data and check the store data box for storing data. Add $corrAns to the correct answer option. Now go to the custom tab and add a code

component. This data needs to be at the beginning of every routine, so which means, every trial, this should get updated and a new location should be thrown to the location variable. Paste this code in the beginning routine and Begin experiment. Adding Excel next and these are the parameters that we need to run the staircase procedure,so we are creating five parameters label, first parameter start value : on first trial, what should be the contrast level, it is the contrast that you're titrating for, in this particular particular task.if It's a correct answer. You reduce the contrast level, if it's an incorrect answer. Second main parameter is the step size,you increase the contrast level making it easier. Fourth parameter is max Valium, wherein contrast value so it should stick between zero and one.you should have at least 100 repetition in this kind of a task for the contrast value to titrate.we have a fixation from 1 to 2.We have a grating from to 2.2 2.3 and we have the layout. We have the position that is very strange to see to set every repeat we have.Now to change the appearance of the gratings creating contrast here this is going to be of course, a variable contrast level. Level is the name of the variable so that is fixed..give correct responses the contrast value of that grating is going to get reduced and because it won't be visible in 10 trials but over 50 80 100 trials is going to be visible.

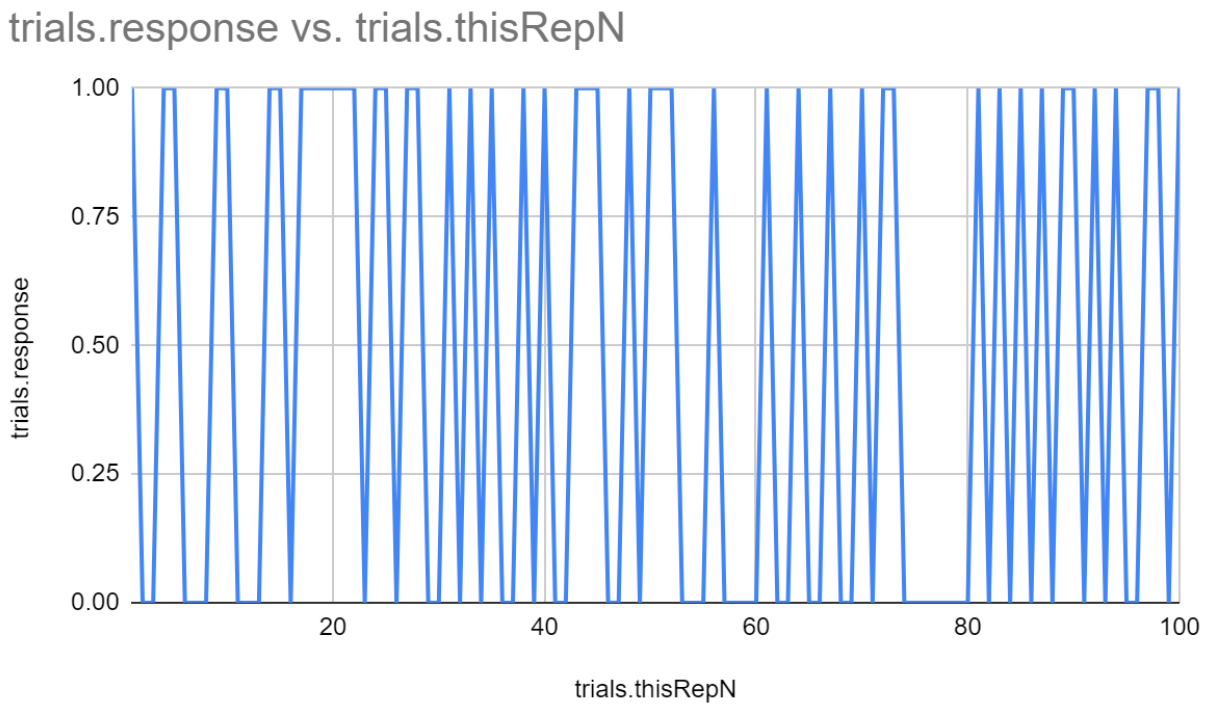
Results



Contrast level (trials.intensity): The accompanying chart portrays the connection between the contrast value and the quantity of preliminaries. As per the diagram, the degree of differentiation of the grinding is seen to be going up from 0.05 as the preliminaries progress. The information is by all accounts consistent, but there are two situations in the diagram. Hence, if the response is incorrect the contrast increases. If the answer is correct the contrast keeps on decreasing

preliminary, where the focuses show an expansion conversely; this conveys that the subject might have answered incorrectly. In the above experiment the participant had some incorrect responses therefore, the graph has a stable increase in the intensity (contrast value).

When the threshold is crossed, the heading of stimulus intensity turns around. This works on the effectiveness of the technique by keeping the stimulus a lot nearer to threshold than is the situation for the technique for thresholds. The threshold is functionally characterized as the mean worth of all improvements introduced, beginning with the second trial. The outcomes showed a threshold of 0.0513741 for this informational index.



Exactness (key_resp.corr): The accompanying chart portrays the precision of the subject's reactions. Here 1 implies that the reaction was right and 0 implies that it was inaccurate. As seen in this diagram most values keep varying from 0 to 1 and vice versa implying that reactions given by the subject were 47 times correct and 53 times incorrectly.

Discussion

The staircase approach's drawback is that the stimulus is well aware of the order in which the stimuli are delivered. A significant issue in psychophysics is that amplitude grows as stimulus intensity increases. Psychophysical techniques that gradually raise or lower the sensory threshold to measure the stimulus's strength gradually lose their effectiveness over time. This is true even though he is a natural speaker by nature. estimating the strength of the sensory reaction