EXPERIMENT 1:
ADAPTIVE STAIRCASE PROCEDURE

PSY310: Lab in Psychology

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INTRODUCTION:

A psychophysical technique known as the "method of ups and downs" (Cornsweet, 1922) or an adaptive staircase process actively adapts the stimulus to the subject's response to it (Hairston et al., 2009). In this approach, the individual is asked if they noticed the stimulus. If the participant doesn't pay attention to the stimuli, the intensity of the stimuli either increases (becomes stronger to permit perception of the stimuli) or decreases (becomes weaker to make perception of the stimuli difficult) if the person answers properly. The experiment's main objective is to ascertain the threshold at which a person may perceive a sensory stimulus.

The stimulus is actively adjusted using a psychophysical method called the "method of ups and downs" (Cornsweet, 1922) or an adaptive staircase process (Hairston et al., 2009). In this method, the subject is questioned about whether they were aware of the stimuli. The intensity of the stimuli either rises (becomes greater to facilitate perception of the stimuli) or lowers (becomes weaker to make perception of the stimuli difficult) if the participant doesn't pay attention to the stimuli. Finding the threshold at which a person may receive a sensory stimulation is the main goal of the experiment.

The experimenter has used the adaptive staircase method for identifying sensory threshold of the participant.

METHOD:

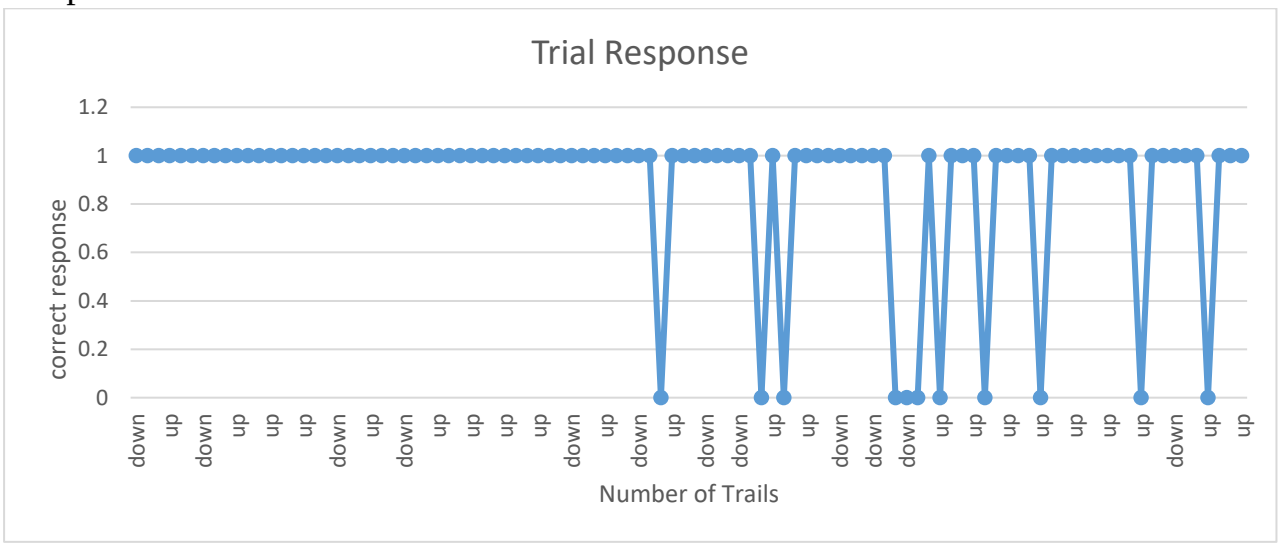
Participant: The study recruited a 20-year-old undergraduate student studying at Ahmedabad University.

Materials and procedure: PsychoPy was used to create an adaptable staircase technique. On a 15.6" monitor with a spatial resolution of 1000 x 846, the stimulus was shown. The one up, three down method was applied in the experiment. The experiment's stimuli consisted of a sinusoidal grating with a Gaussian mask that appeared in the centre of the screen for 300 milliseconds and had a spatial frequency of 9 and a contrast of 0.6 units. The participant's goal was to recognize the tilt and answer with an "up" key when the stimulus was slanted to the right and a "down" key when it was tilted to the left. The stimulus was tilted to the right or left (Fig. 1). There were 101 total trials in the experiment, and to prevent any learning, the tilts were randomized. Data was automatically stored in the form of an Excel sheet by the PsychoPy software, where it was further cleaned and analysed.

A. Left tilt

B. Right tilt

C. Adaptive Staircase



RESULTS:
The absolute threshold of the participant was 1.33 degrees. Initially the participant had a very good accuracy rate and later it changed.

DISCUSSION:
The absolute threshold for detecting the tilt of sinusoidal gratings was found to be 1.33 degrees in this experiment. Additionally, a particular accuracy rate in detecting the grating's tilt over the course of 101 trials shows that individuals had a strong capacity to recognize minute variations in orientation. There are, however, a number of drawbacks that should be acknowledged. First, utilizing sinusoidal gratings as stimuli would not accurately represent the complexity of actual visual stimuli, and the threshold measurement might have been impacted by the particular properties of these gratings. Despite these drawbacks, this research adds important knowledge on perceptual thresholds and their significance for comprehending human visual processing. Additional study might examine the variables affecting individual variations in absolute threshold and their possible effects on practical applications, including medical diagnosis or product design.