

Orientation Discrimination Task

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Introduction

Recent fundamental advancements in psychophysics have matched the problem of response bias in sensory experience. According to Green and Swets (1966), there are detection experiments explained by a theory called 'signal detection theory'. From this theory, it can be inferred that there are no undeniable stimulus thresholds. However, the process of detecting stimuli tends to rely more on the physical energy that is accosted to stimuli along with the other factors that may include the costs and gains that come along with detecting that particular stimulus. The detection experiment provides a possible starting point for determining the non-sensory aspects of response bias. The first one is differential payoff using a payoff matrix. The payoff matrix gives some amount each time the subject 'hits' or makes a 'correct negative' and then reduces some amount each time the subject 'misses' or has a 'false alarm' according to the schedule of gains and losses. This is referred to as the 'payoff matrix'.

Method:

PsychoPy v2024 was used for the experiment, a software that was developed. A 13-inch monitor was used. An orientation discrimination task was used in the experiment. After the fixation, the trials were expected to display sinusoid with a Gaussian mask for as short as 0.3 seconds. The first sequence is taken every 3 seconds with a variable slight tilt. As reaction time to the figure, after it was displayed, the participant was required to use the arrow keys and make a decision whether the figure displayed on the screen is vertical or not, using the 'up' arrow key for a positive answer and the 'down' arrow key for the negative one. They stay in trial only where a critical response has been developed.

Outcomes:

Hit: Correctly detecting the signal when it's present.

Miss: Failing to detect the signal when it's present.

False Alarm: Incorrectly detecting a signal when it's absent.

Correct Rejection: Correctly identifying that no signal is present.

Results:

The d' value is calculated to be -0.02365, while the criterion (C) was found to be 0.02365

Discussion:

Here, d' refers to the signal and noise of a decision-making task to evaluate the participants' ability. The Criterion measures signal and noise to discern between the two by employing the prejudice found in signal or noise. Because the criterion value is less than 0, the part used a conservative criterion.

References:

Unit 2 psychophysics: Threshold, signal ... (n.d.-b).

<https://egyankosh.ac.in/bitstream/123456789/23282/1/Unit-2.pdf>