

Visual Search Experiment

PSY310: Lab in Psychology

Lab Report



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GitHub link:

<https://github.com/devanship-stack/PSY310/upload/main>

Introduction

Visual search task is an experimental paradigm that studies visual attention and can address questions including the nature, function, and limits of preattentive processing and focused attention (Chan & Hayward, 2013). The Visual Search task involves an observer scanning the area to locate a target object among the distractors. In many everyday activities, such as searching for a friend in a crowded hallway or finding an object in a untidy, cluttered room, this cognitive function is frequently used.

Human visual attention and perception are better understood when one is aware of the processes involved in visual search. There are two kinds of visual searches: 1) Feature search 2) Conjunction search. In conjunction search, a number of features serve as the differentiating variables, while in feature search, the target varies from the distractions by just one attribute. It investigates how stimulus, target, and set size are related.

Method

Participants

A 19 year-old undergraduate female student of Ahmedabad University was taken as a participant. She was informed about the experiment's objective, and was briefed about the procedure, which was to understand human visual attention and the factors influencing attention, perception, and search efficiency.

Materials and Procedure

In the experiment, participants identify and locate specific targets among distractors in a visual display, examining factors affecting search time, accuracy, and cognitive processes involved in target detection. This Visual Search experiment was created using PsychoPy3 Experiment Builder (v2021.2.3), on a desktop window with a resolution of 1440 x 900 pixels. 100 trials of the experiment were conducted.

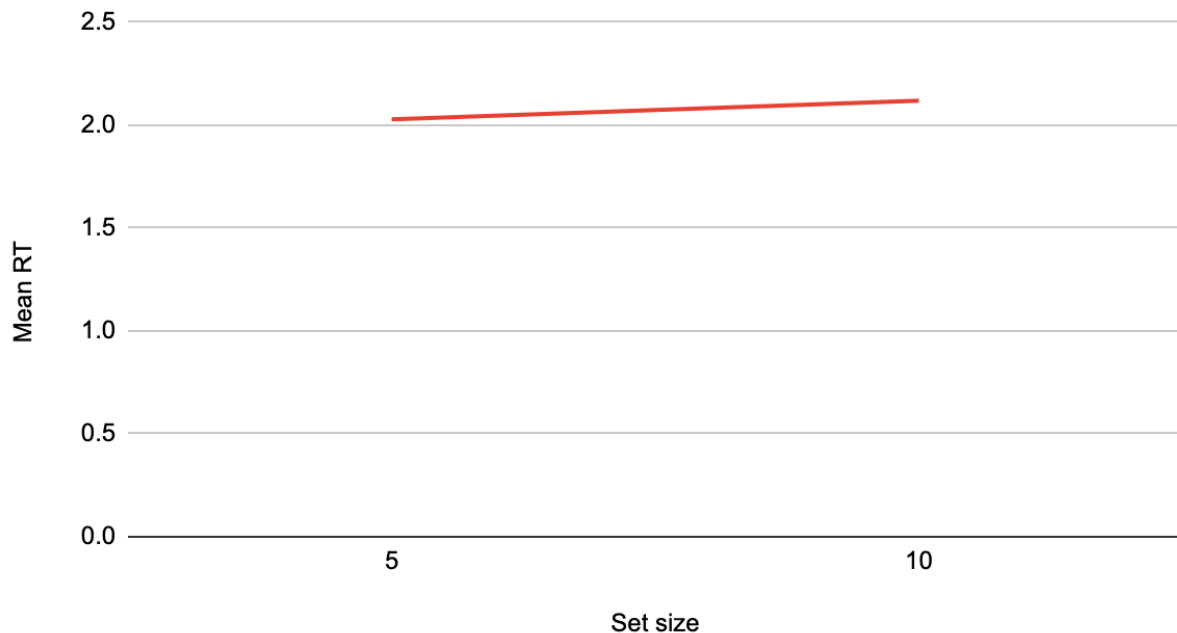
The trial began with a fixation cross at the centre of the screen, along with numerous 'L' (distractors) and a 'T' (target). The participant was asked to search for and click on the target 'T' among a number of distractors 'L'. The distractors and target appeared in set sizes of either 5 or 10. The target and the distractors were randomly placed, and the distractors were oriented in random angles. The participant used the mouse to click on the target.

The time taken to search and respond (reaction time RT) was measured and the accuracy was recorded and calculated.

Result

The following graph shows the mean RTs of the participant in both the set sizes.

Mean RT vs. Set size



As per the data collected, we calculated the mean RT of the participant in set size 5 to be 2.028179892 and the mean RT of the participant in set size 10 to be 2.118936549.

As per the chart,

$$\text{Slope} = (y_2 - y_1) / (x_2 - x_1)$$

where x is the set size and y is the RT

Therefore, here the slope = 0.18151331

Discussion

The participant's overall time to identify the target can be estimated and inferred from the slope. A slope that is closer to zero is considered as a good slope. The slope as per the participant's responses is 0.18151331 (nearer to zero), and hence is a good slope and suggests that the participant was focussed and attentive while performing the task. In addition to that, we find out that the average reaction time is about 2 seconds, from which we can infer that the participant prioritizes accuracy over speed. Furthermore, we find that the set of 5 elicits a smaller reaction

time than the set of 10. Therefore, we can conclude that when there are less distractions, it is easier to identify the goal than when there are more.

References

Chan, L. K.H., & Hayward, W. G. (2013, March 19). Advanced Review Visual Search. *WIREs Cognitive Science*, 4(4), 415-429.

<https://wires.onlinelibrary.wiley.com/doi/full/10.1002/wcs.1235>