Tutorial 2: Visual Search Experiment

PSY310: Lab in Psychology

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

Introduction :

The visual search is a cognitive research that helps to study attention and its mechanisms. In a layman language visual search is basically a experiment wherein multiple or several objects which are presented on the screen from among the target in this contest of experiment its “T”. This process involves individuals who are targeting a particular target within the visual limitations while being distracted by clutter.
Psychologists use visual search to identify various types of attention,processing speed, control to memory , efficiency and allocation . Thus, it helps us to understand attention and how visual search efficiency links with it :

1. **Selective attention** : In this experiment the visual search individuals visualize specific features or attributes of objects such colour contrast , shapes,size or appearance to identify the target among the distraction in a clutter . This helps researchers in their understanding of the selective attentional deployment to various visual indicators.
2. **Parallel and Serial processing** : There are two types of visual search :;

    - **Parallel processing**: the attention is distributed wherein the target recognition is reasonably quick and independent of the amount of distractions since attention is dispersed simultaneously over the full visual field.
    - **Serial processing**: it allows only one object at a time to be processed plus its a step by step process for each object on to the display and the time taken to find the target increases with the number of distraction.

3. **Feature Integration Theory**: The idea clarifies how attention is employed to connect various visual components into cohesive objects. By analyzing how well people can mix elements to find their intended destination, visual search aids researchers in understanding how this hypothesis is tested and validated.

4. **Attentional Capture**: The visual search experiments can help the researchers to understand as to how attention can be captured by salient or unexpected stimuli . If one object/item is unique can capture attention automatically.

5. **Visual Search Efficiency** : It refers to the how quickly and accurately an individual can locate a target within a visual array . In this the term efficiency refers to reaction time and error rates.

6. **Attentional Bottlenecks**: When attentional resources are scarce and people struggle to concurrently process all relevant data, attentional bottlenecks might happen.

Method :

The experiment will be conducted by using a software called PsychoPy. The primary goal of this experiment is to identify as how individuals locate specific target within the visual display or its parameter . Thus, helps us to understand the attention,perception and search efficiency .

Participants :

The experiment was carried out by 4 individuals as a part of the PSY310 Lab in Psychology at Ahmedabad University.

Observation :

The total number of trials used was 200 trials for the visual search experiment

Materials and Procedure :

- We received a video wherein the instructor explained the procedure before the experiment was performed. The application that we used was our personal laptop with the latest version of PsychoPsy.
- Following are the procedures for the staircase experiment on PsychoPy:

1. Open PsychoPy-2023
2. Stimuli >Polygon Properties > Basic >Name-Fixation> Shape- cross ; Layout >Size(w,h)- $(0.1,0.1) >Test(test properties) >Text- T >Name- target
3. Click Safe file > Structure > Find : distr (copy the entire section)
4. Custom >Code > Begin Routine >Paste the distr > Paste the entire the structure from the tutorial video > copy the structure - random()-0.5, random()-0.5

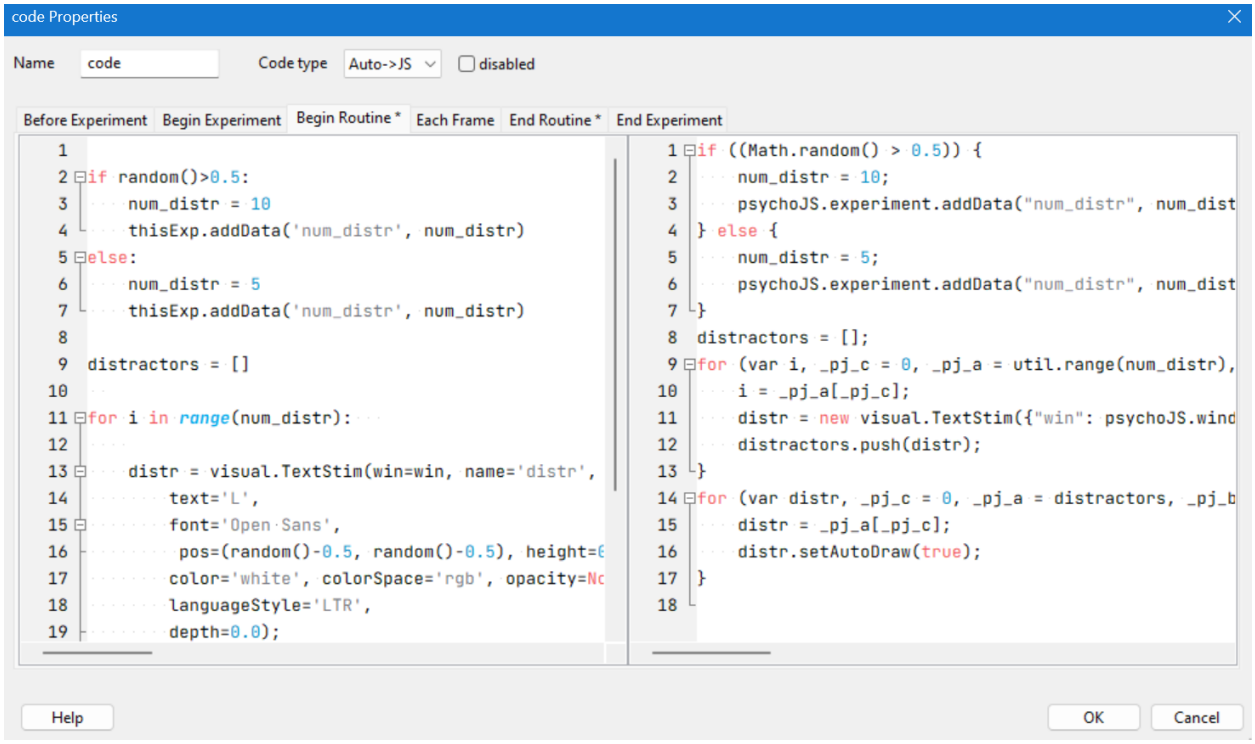


Table 1

5. Click the target (target properties) > Layout > Position (x,y)-$ random()-0.5, random()-0.5) [Paste the structure] > set every repeat
6. Mouse Properties >Basic > Click stimuli - $target >End routine on press - any click; Data >store params for clicked - routine
7. Click fixation properties >Basic >duration (s) - remove
8. Click on insert loop > Name- trials >nReps- $ 200
9. Mouse properties >Basic >duration (s)- remove
10. Code properties >End Routine

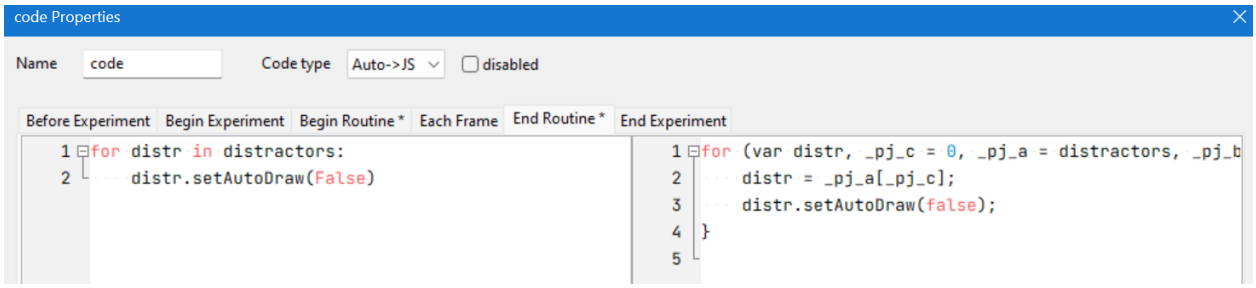


Table 2

11. Run the experiment

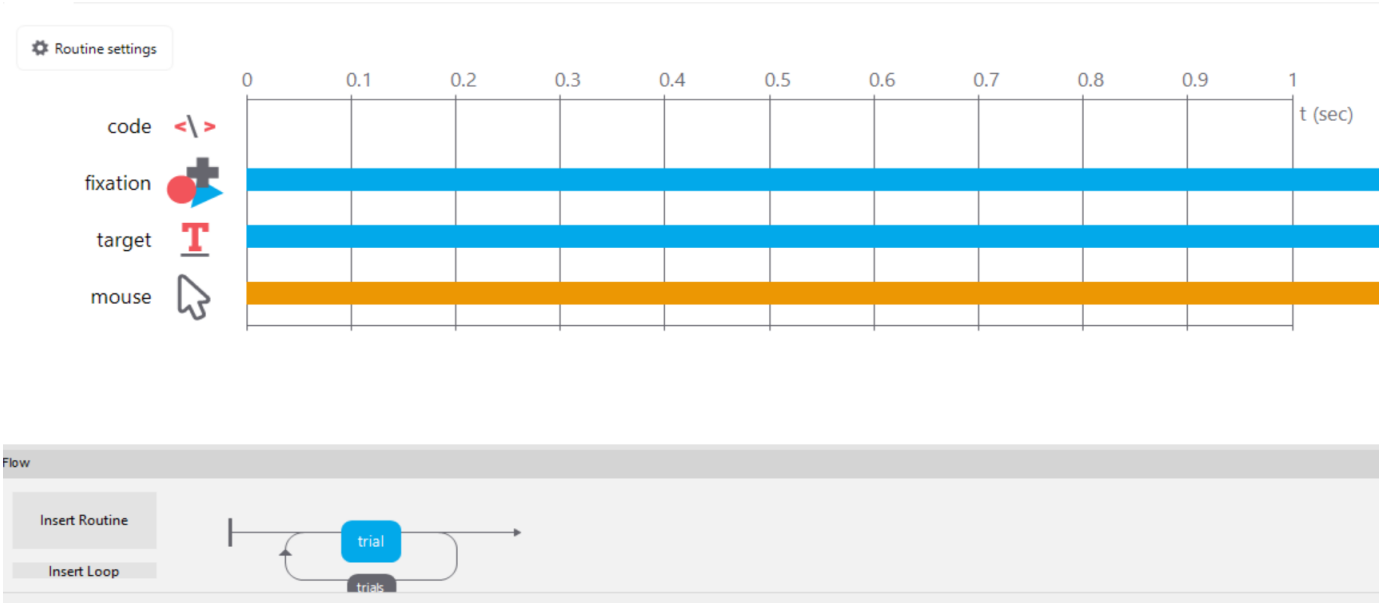


Table 3

Testing Conditions:-

The participants were told to perform 200 trials in one class. Thus , the experiment was done smoothly and their was no distraction . Plus, the task was continuously performed.

Data Collection:-

The data was collected from 5 individuals/peers of the student . The data was segregated into different categories- reaction times, accuracy and set sizes .

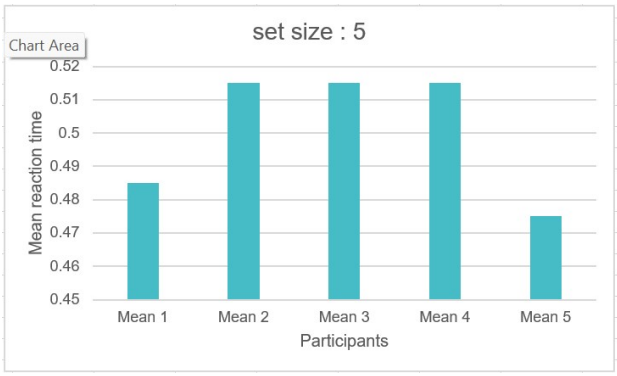
Results

The mean reaction time for 200 trials of the 5 participants are :

Participants	Mean 1		Mean 2		Mean 3		Mean 4		Mean 5	
set sizes	5	10	5	10	5	10	5	10	5	10
Mean reaction time	0.485	0.515	0.515	0.485	0.515	0.485	0.515	0.485	0.475	0.525

Table 4

The graphical representation of the mean reaction time of the 5 participants in both the set sizes 5 and 10 respectively.



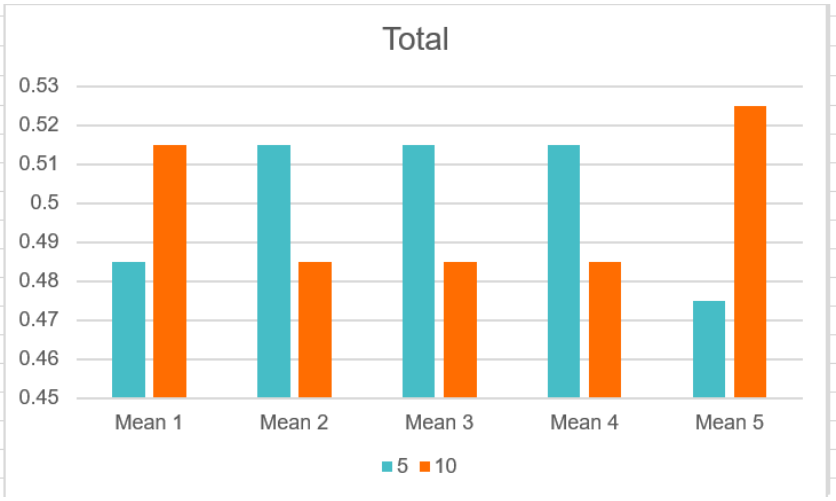


Table 5

The slope size for the set size vs reaction time for each 5 participants -4.5335,-4,5665,-4,5665,-4,5665,-4,5225.

Discussion: -

The reaction time is very related to the attention whereon if it has more reaction time and less the participants is and vice versa. In this case the slope is negative due to which it shows that a greater set size generates to higher reaction time .