

Muller frame experiment

Abstract.

The problem of this report was consistent or inconsistent the original hypothesis of Müller-Lyer illusion by using 160 university students. The apparatus which were used is Müller-Lyer illusion frames. The results improved the Müller-Lyer hypothesis about illusion.

Introduction:

In this report we are going to investigate the famous optical, distortion and the Müller-Lyer illusions. The history of the Müller-Lyer illusion dates from 1889 when Müller Lyer published his article on a German scientific journal called "Optische Urteilstäuschungen". It is now generally agreed that there are two main illusion theories, which are Gregory's theory (1990) and Day's conflicting cues theory (1989). Day's conflicting cues theory asserts that the edges of the figure interfere with estimation of line length. Gregory thought that the lines with inward and outward fin are typical of perspective drawings of corners. He found that the theory of size constancy scaling. Size constancy occurs when the apparent size of an object remains constant, independent of the distance of the object from the observer, even though the size of the retinal image varies with the distance. So the length of the figure conflicts with the length of the line. It is predicted that steep angled fins will result in greater distortion than gentle angled fins.

Method:

Participants. In this experiment participated 160 first year Psychology and Criminology students from the Edinburgh Napier University. Age and sex was not recorded, because it is not significant to the research results. This experiment was conducted by tutors from Napier University. This experiment did not hold any awards for the participants. People who attended this experiment had normal or corrected-to-normal vision, and were native to the purpose of the study.

Apparatus. In this experiment participants used 2 Müller-Lyer illusion frames. The apparatus which were used in experiment has a ruler on one side, consisting of two different slides that are attached to each other but still allowed to move in a horizontal sliding movement, the frames have a whole in the middle. There were two types of Müller-Lyer illusion frames in the experiment A and B. The frame B has a whole shaped like a horizontal line with gentle inward pointing fins at the end, the frame A has the same line but at the end there are steep inward pointing fins.

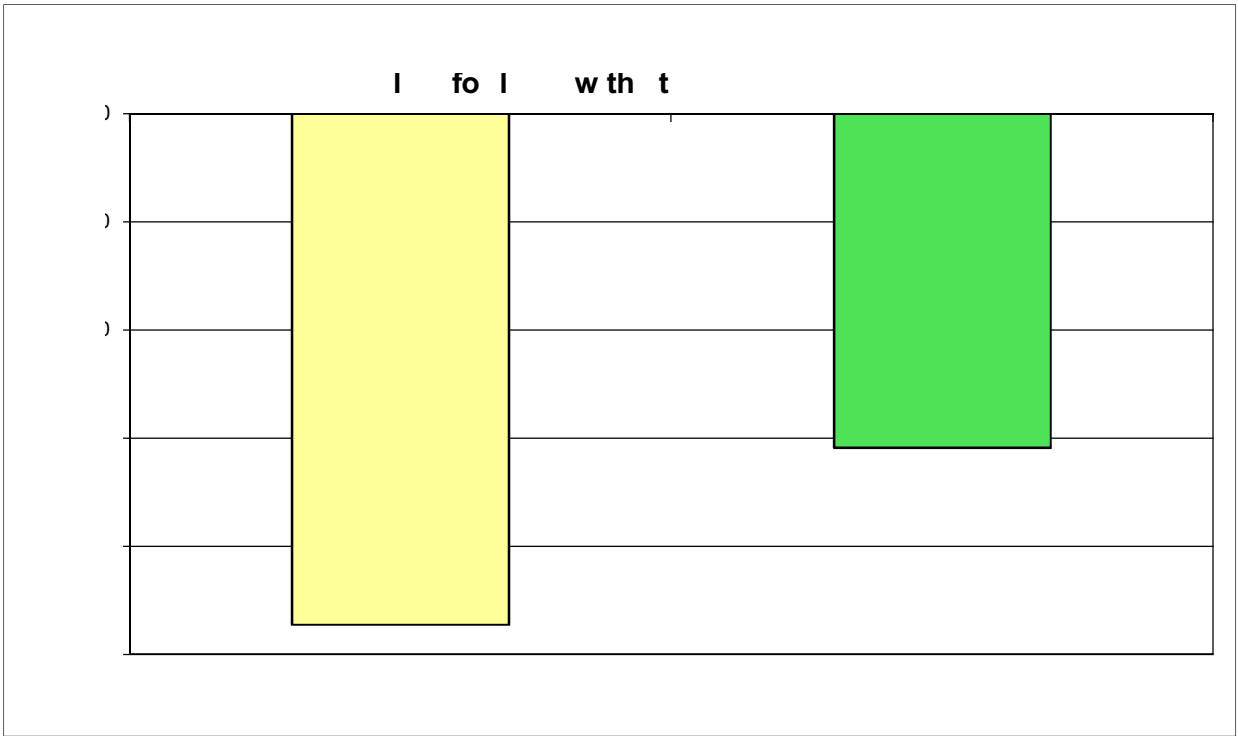
Procedure. In the beginning of the experiment students arranged themselves in pairs. All of the participants had an even or odd number of pairs. The tutor assigned all students from 1 to 18. Then pairs of students were asked to form bigger groups which contains 4 people each (two pairs). When the groups of four people were formed each pair was given Müller-Lyer illusion frame. The students who had odd number started the experiment as experimenters (E1st) and students who had even numbers started as participants (P1st). The experimenter role in this experiment was to move the ruler according to the instructions and record the results of the ruler. The participant and experimenter had to sit face to face in different sides of the table. The experimenter who had lowest number in the group started with frame A, and the other experimenter who had highest number started with frame B. At the beginning of the experiment the slide was pushed to the right side. The E1st started to move the slide very slowly. The P1st had to guide the movement of the slide until

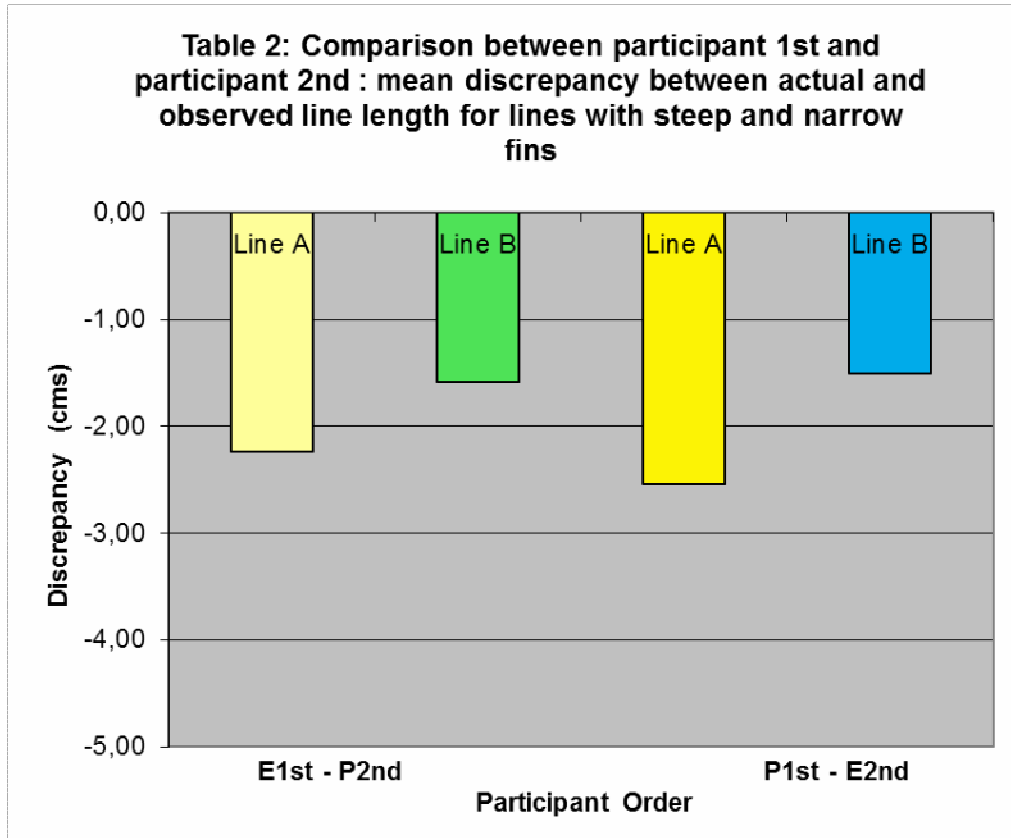
the two lines bounded by the fins until they appeared to be the same length. The P1st had to say stop when he felt satisfied with their estimate. After this procedure E1st swapped the frame and repeated the procedure again. All the results were written down. In the second part of this experiment students changed their roles. This time student who had the odd numbers were the participant 2 (P2nd) and students who had the even numbers were experimenters 2 (E2nd). The procedure was the same as in part one.

Results:

| E1st – P2nd | | P1st – E2nd | |
|-------------|--------|-------------|--------|
| Line A | Line B | Line A | Line B |
| -2,24 | -1,58 | -2,54 | -1,50 |

| Group Mean Error steep angled fins Line A | Group Mean Error gentle angled fins Line B | <i>p</i> |
|--|---|----------|
| -2,37 | -1,55 | 0,00 |





As we can see the average error scores for E1st when using frame A was -2.24 and using angle B was -1.58. The average error scores for P1st when using frame A was -2.54 and using angle B was -1.50. These results displayed that P1st had more errors than E1st when using frame A, however P1st had less errors than E1st when using frame B, and it means that knowledge of knowing the ruler location doesn't have large affect. The table which presents errors about angle A and B show that students made more errors when they used angle A. All these findings supported the Gregory's size constancy scaling theory.

Discussion:

In the beginning of the experiment we predicted that steep angled fins will result in greater distortion than gentle angled fins. The results of the experiment showed that our experiment was successful, because we consistent the size constancy theory which occurs when the apparent size of an object remains constant, independent of the distance of the object from the observer, even though the size of the retinal image varies with the distance. The suggestion which can be given for further research in this area can be such as testing whether the illusion occurs in the absence of depth cues or test Davy's conflicting cue theory, because it is a very important in this field. Also this experiment adequately explains Gregory's theory, because if the angles represent the corner of a house, then a steeper angle would also be perceived as taller because it would present a view from further away than the gentler angles.

Word count: 958