The Changes of the Perception of the Slope of the Line in the Context of the Ambiguous Figure

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Abstract:

It is known that the interpretation of an ambiguous figure influences the effectiveness of solving cognitive problems (search the differences task, stimulus detection) (Filippova, Moroshkina, 2015; Karpinskaia, Vladykina, 2009). The perception of orientation depends on many environmental factors, but we suggested that the interpretation of the context influence the result. Ten participants (4 men and 5 women, age 19-42) estimated the slope of the line in the context of the ambiguous figure “pyramid-corridor”. All of them used both variants of the interpretation during the experiment: 5 persons had the instruction to see the “pyramid” in the first part, and the “corridor” in the second part, while the other 5 had to see it as a “corridor” in the first part, and after that changed to “pyramid”. The subjects sat in front of the computer screen and they saw the red line in the context of the “pyramid-corridor” image. The line was located in the low right part of the picture near the right diagonal. The diagonal could be interpreted as the angle between the right wall and the floor (corridor version) or the right rib of the pyramid (pyramid version). The participant could change the orientation of the line by pressing the key “left-right”. The task was to make the line parallel to the diagonal. Each person had 50 trials in each part of the experiment (100 trials in total). We compared the true tilt angle of the diagonal and the perceived angle of the line (that was made by the person). The dependent variable was the orientation of the line (angle), and the factor was the interpretation of the ambiguous figure (pyramid or corridor). The true tilt angle of the right diagonal of the image was -38°. When perceiving the image as a “corridor”, subjects underestimated this angle (-33.5°±0.62°, $t(10) = 24.06$, $p < 0.0001$); when perceiving the image as a “pyramid”, subjects overestimated it (-41.6°±1.6°, $t(10) = 7.39$, $p < 0.0001$), the values of underestimation and overestimation are different from each other ($t(10) = 14.22$, $p < 0.0001$) (Student's t-test).The hypothesis about the influence of the interpretation of the ambiguous figure on the perception of the line orientation was confirmed. The results are consistent with the experiments, which demonstrate the role of consciousness and stimulus interpretation in psychophysical tasks. In our previous results in the experiment of fixing the strength of visual illusions Ponzo and Muller-Lyer in the group of preschool children (Romanova-Afrikantova, 2023), it was found that the effect depends on the development of visual perception especially on the constancy (Piaget J, 1947). So we predict the absence of the differences in the estimated of the slope of the line in the context of the ambiguous figure “pyramid-corridor” in preschool childhood. Supported RSF 22-18-00074.

Keywords:

ambiguous figure, line orientation and slope, perception.