

The Influence of Directionality on the Giovanelli Illusion

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Abstract : In the Giovanelli illusion, some collinear dots appear misaligned, when each dot lies within a circle and the circles are not collinear. In this illusion, the role of the frame of reference, determined by the circles, is considered a crucial factor. Three experiments were carried out to study the influence of directionality of the circles on the misalignment. The adjustment method was used. Participants changed the orthogonal position of each dot, from the left to the right of the sequence, until a collinear sequence of dots was achieved. The first experiment verified the illusory effect of the misalignment. In the second experiment, the influence of two different directionalities of the circles (-0.58° and $+0.58^\circ$) on the misalignment was tested. The results show an over-normalization on the sequences of the dots. The third experiment tested the misalignment of the dots without any inclination of the sequence of circles (0°). Only a local illusory effect was found. These results demonstrate that the directionality of the circles, as a global factor, can increase the misalignment. The findings also indicate that directionality and the frame of reference are independent factors in explaining the Giovanelli illusion.

Keywords : Giovannelli illusion, visual illusion, directionality, misalignment, the frame of reference

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