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Distorted shape perception

It is known that visual illusions lead to a distorted perception of the length and orientation of lines, but it is not clear how these illusions affect the appreciation of the shape of closed forms. In this study two experiments were performed to characterize distortions in the visual perception of the shape of quadrilaterals and the extent to which these distortions were similar to the distortions of haptically sensed shapes. In the first experiment human subjects were presented with two quadrilaterals side by side on a computer monitor. One was a reference shape; the other was rotated and distorted relative to the first. The subjects used the computer mouse to adjust the corners of the distorted quadrilateral to match the shape of the target quadrilateral. They made consistent errors on this task: the adjusted quadrilateral was about 2% wider and about 2% shorter than the veridical shape. Furthermore, subjects adjusted the inner angles of the quadrilateral to make them closer to 90 degrees. The first type of error was also present in a second experiment in which, in a two-alternative forced-choice paradigm, subjects viewed a reference shape and were asked to indicate which of two transiently presented quadrilaterals was closest to the target shape. The width/height errors and the inner angle errors were comparable to those described previously when subjects felt the outline of a quadrilateral and then drew its reproduction in the absence of vision, suggesting that the distortion occurs in the process of remembering the shape.

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