

Vertical Foreshortening Effect and the L Illusion

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Abstract

Researchers have found that a perceptual error (an overestimation of the vertical line in comparison to the horizontal) usually occurs with a range of about 11-15% for an inverted letter T (IT) figure and about 3-9% for a letter L(L) figure (Avery & Day, 1969; Brosvic & Cohen, 1988; Collani, 1985; Finger & Spelt, 1947; Kunnapas, 1955, 1957, 1958; McBride, Risser, & Slotnick, 1987; Post & Chaderjian, 1987; Ritter, 1917; Rivers, 1901; Schiffman & Thompson, 1974; Wundt, 1859, 1898). Although these two illusory effects are obviously different, they have been considered as the same illusion, namely the vertical-horizontal illusion. Kunnapas (1955) explicitly hypothesized that a part of the illusory effect of the IT figure is caused by the bisection illusion effect. In other words, the difference between those two figures' illusory effects can be explained by the fact that the horizontal line in the IT is bisected by the vertical line. Therefore, to classify these two illusions as one type of illusion became logically acceptable and it has never been challenged. According to the viewerness-thatness-thereness (VTT) model (Hui, 1996), the L and the IT figures represent two different spatial relationships. Therefore, they are caused by different inferential contents as well as processes. The present paper focuses on the L illusion. According to the VTT model, an L figure would evoke a two-dimensional object representation, in which the vertical line represents its vertical dimension and the horizontal line represents its horizontal dimension, and the two-dimensional object is facing a self-assigned viewer. It resembles a situation, such as a wall which stands in the front of a viewer. Its left edge and the foot line correspond to the two lines of the L figure. Thus, the L illusion might be caused by a vertical foreshortening effect. To support this hypothesis, the present researcher reinterpreted the empirical data from an experiment done by Collani(1985). Then, three figures were designed and named as Trapezoid, Triangle, and Fence-like figures. Although each of these figures contains a vertical line (which bisects the horizontal line, just like in an IT figure), they most likely evoke two-dimensional object representations, such as a trapezoid, a triangle, and a fence. Therefore, a vertical foreshortening process would operate as well, producing about 3-9% of illusory effect as the L figure. In other words, the

fact that each of their horizontal lines was bisected would not cause their illusory effects as same as the IT illusion (about 11-15%). The results confirmed the predictions.