

Müller-Lyer Haptic Illusion and a Confusion Theory Explanation

MANY geometric visual illusions have haptic analogues¹. The most studied is the Müller-Lyer figure. Gregory² has recently given strong evidence in support of a perspective theory of the visual variant. Day³ has argued in favour of a common explanation of both—a suggestion which would rule out the perspective theory, as the haptic variant has been demonstrated on congenitally blind subjects⁴. It seems that the simplest explanation of the Muller-Lyer haptic illusion has been ignored. This is the confusion theory⁵. Under this the illusion results from the mere confusion of the arrow-heads' apices with their fins.

In the present experiment Revesz's passive technique¹ was used. E. drew S.'s index finger from a position of rest on one end of the figure longitudinally over the rest without stopping at the other end (Fig. 1). S. then said which segment of the centre line he thought was bigger. To avoid confusion the figure was originally described to S. demonstratively by touch using the terms 'point' and 'line' only, and he was instructed to ignore the shorter lines as much as possible in making his judgments. The method of limits was used—the position of the centre arrow-head was varied along the centre line for each judgment. Two variables were investigated—the direction of finger movement and the direction in which the arrow of the figure pointed. Both could be either towards or away from S. Seven students were tested.

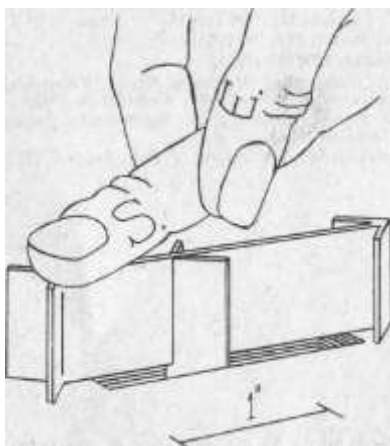


Fig. 1

From the confusion explanation one would expect the three points where the centre line is intersected to be always confused with the fins except when the finger is initially placed at the pointed end. A clear impression of this point only should then be received because S.'s finger is initially at rest on this same point. Consequently the illusion should be greater when the finger is begun at the tail end of the figure. An analysis of variance confirmed this ($P < 0.001$). Contrary to expectation, further analysis showed that when S.'s finger was initially placed at the pointed end the illusion was not significant ($P < 0.15$ on a one-tail t -test).

We chose the passive technique as it appeared to give us more control over the stimulus. However, we found it a very difficult and inelegant method; S.'s hands were often too limp or too stiff or they perspired. Despite these criticisms the results seem positive enough to give some support to the confusion theory.

With this explanation, repeated inspection trials would be expected to lead to an improved perception of the figure with less confusion and a consequent decrement in the size of the illusion. This has been found by Rudel and Teuber⁶ although they used a different technique and a Muller-Lyer figure five times as large as our own. They also found a transfer of decrement from touch to vision and vision to touch. This remains unexplained by our results, which endorse the view that the two illusions require different explanations.

ANN WATSON
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¹ Revesz, G., *Z. Psychol.*, **131**, 296 (1934).

² Gregory, R. L., *Nature*, **207**, 16 (1965).

³ Day, R. H., *Nature*, **207**, 891 (1965).

⁴ Teuber, H-L., in *Handbook of Physiology*, Sect. I, *Neurophysiology*, edit. by Field et al. (American Physiol. Soc., Washington, 1960).

⁶ Woodworth, R. S., and Schlosberg, H., *Experimental Psychology*, third ed. (Methuen, London, 1954).

⁸ Rudel, R. G., and Teuber, H-L., *Quart. J. Exp. Psychol.*, **15**, 125 (1963).