the items after 24 h. The differences between the recall scores of Groups I–IV thus appear to be primarily due to proactive interference.

The correlation between speed of learning and recall of T was negative but low. However, there were indications in the results of a positive correlation between the number of reinforced repetitions and the probability of recall of individual items, supporting Warr's findings.

The results yield clear-cut evidence for the assumption that proactive inhibition is a factor determining retention, although the effects were smaller than might be expected from Underwood's curve. At the same time the results are consistent with the argument that part of the differences in retention interpreted by Underwood in terms of proactive inhibition may simply reflect differences in degree of learning of the items.

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Illusory Perception as a Constancy Phenomenon

Gregory[1] offers a general account of visual illusions, relating the apparent distortions in them to the perceptual process of size constancy. He observes that Tausch is the only previous writer to have considered constancy in relation to illusions. However, Gibson[2] has incorporated illusory perceptions within the context of size constancy, and suggests that perception of size is a by-product of a constant scale, which Gregory calls 'constancy scaling', at different distances. Arguing that illusory figures are "flat projections of typical views of objects lying in three-dimensional space", Gregory notes that "the parts of the figure corresponding to distant objects are expanded and the parts corresponding to nearer objects reduced". He states the same principle more simply when he writes: "Those parts of the figures which would normally be further away in 3-D space appear too large in the illusion figures"[3]. These principles are applied to a series of illusions, including those of Müller-Lyer, Ponzo and Hering. Gregory therefore postulates a common process modifying retinal images in constancy scaling and in the perception of illusory figures.

If this general principle operates, it is difficult to understand why the distorting process does not occur under all the conditions in which distance is perceived in two-dimensional figures. In Ponzo's figure the same one of the two central lines appears longer, no matter whether it is seen as nearer or farther after rotating the figure through 180°. Similarly when only the top or bottom half of either forms of Hering's illusion is inspected, the parallel lines appear to be distorted, no matter which way the perceived depth or distance appears to be in the background field. Further, Gregory's contention that "the scaling can be set directly by depth features of flat figures"[4] does not seem to be supported experimentally in all illusions. Green and Hoyle[5], for example, found that the Poggendorff illusion did not give rise to 3-D perception under reduced cue conditions. Their finding also is substantiated by Gibson[6], who reports that when the texture of a pattern becomes indeterminate the observer no longer sees the dimensions of a surface but a depthless shape perceived in the frontal plane.

Gregory's predictions, when applied to different orientations of visual illusions, are therefore not supported. In fact the illusions are more stable than Gregory's predictions would suggest, since changing the constancy relationships does not necessarily change the illusory effects. However, if the constancy interpretation of illusions is to be accepted it must be applicable to all conditions of inspection, and not only to a single orientation of the figure.

Although we do not have an alternative general explanation of the cause of visual illusions, we would offer some suggestions concerning specific factors operating in the illusory patterns being discussed. First, the relative position of the two horizontal lines in Ponzo's figure seems more important than the distance at which they appear to be located. Then, the distortion in Hering's illusion, or in Gibson's texture gradient, occurs as a function of the density of background lines: that is, the closer together these lines are, the more distorted the illusory lines appear, irrespective of which part of the pattern looks nearer or farther away. Further, predictions can only be made about which sections of the illusory lines will be more distorted, and not about the direction of distortion, that is whether the illusory lines will appear closer together or farther apart, as Gregory's account would require. Finally, some of the illusions considered by Gregory (that is, Hering's, Gibson's texture gradient, Orbison's field of concentric circles and the Necker cube) disappear entirely when the viewing slant is altered or when they are viewed from a distance, although the cues for depth, which set the constancy scaling, still operate[7]. We conclude, therefore, that constancy scaling operates only under a set of very limited conditions of inspection of illusory figures.

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[4] Gregory, R. L., *Nature*, **199**, 679 (1963).
[5] Green, R. T., and Hoyle, E. M., *Nature*, **200**, 611 (1963).
[6] Gibson, J. J., *op. cit.*, 174.
[7] Houssiadas, L., and Brown, L. B., *Austral. J. Psychol.*, **15**, 100 (1963).

There are several hints in the literature of perception of a possible tie-up between constancy and the illusions, but Tausch[1] seems to have produced the first reasonably solid treatment, described clearly by Teuber[2], though he has not developed a fully consistent theory. Brown and Houssiadas's reference to J. J. Gibson's *The Perception of the Visual World*[3] in this connexion is surprising, for Gibson holds a view of constancy which precludes this kind of theory. Gibson starts off (p. 163) somewhat disconcertingly: "The aim of this chapter is ultimately to show that the question of why things retain their sizes and shapes under different circumstances is a false question". (The rest of the chapter is, however, devoted to this question.) He develops a theory of depth perception which he attributes to Koffka[4]—the size-at-a-distance theory—which is that all three spatial dimensions are equally available to the perceptual system. But in denying that depth has to be specially computed, Gibson rejects the notion of constancy scaling essential to this theory of the illusions. When Gibson uses the word 'scale' he is evidently not referring to a process of size adjustment normally giving constancy, for several times he explicitly denies such processes in depth perception.

Gibson says of an illusion figure (p. 181): "All three cylinders are the same size on the page; it is not an illusion at all but a demonstration that apparent size depends on apparent distance". But the fact is that illusion figures are not seen as lying in depth when presented on normal textured paper: hence the problem. It was for this reason I removed background texture by using luminous illusion figures for experimental purposes.

I think Brown and Houssiadas are incorrect in attributing this kind of theory to Gibson, while his account of the illusions seems the least satisfactory part of his treatment of perception.

The main question raised by Brown and Houssiadas is whether the distortions occur under all conditions in which distance is perceived in a two-dimensional figure.