An Evaluation of the Weight of Evidence Theory of Figural Goodness

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The Weight of Evidence theory of figural goodness (Helm and Leeuwenberg,1996; H&L) has been proposed to explain why certain types of regularity are psychologically more relevant than others. This research is the first attempt to directly empirically investigate some predictions of the theory.

Theories of figural goodness explain why some objects appear to be more well-formed than others. For example, consider the upper two patterns in Figure 1. The two patterns are composed of the same segments, but in one case they are organized to form a perceptual grouping of high regularity, and in the other case they are not. The effects of figural goodness can be operationalized in several ways. For example, a random noise element has been introduced into the lower two patterns in Figure 1. The noise element is readily noticeable in the "good" left pattern but less so on the "bad" right one. Intuitively, the good figure segments away from the random noise in the left pattern, but there is no such basis for segmentation of figure and noise in the right pattern.

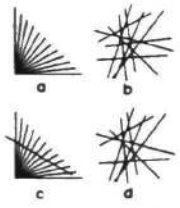

Figure 1: Noise elements are more easily noticed in a good figure than a poor one: The (a), (c) difference is more readily detectable than between (b) and (d).

The effects of regularity on figural goodness have been examined in numerous studies, and the recent Weight of Evidence model by Helm and Leeuwenberg (1996) is an important attempt to explain these effects. The H&L theory has been successfully applied to a range of existing results in the perception literature, but many of the theory's predictions have not yet been subject to direct testing. For example, consider the following symbolic sequences, and corresponding predictions of H&L's theory:

Pair of sequences:	Predicted figural goodness
1) abccbabccbaabccbabccba	high
abababababababababab	low
2) aaabbabaaaabbaba	high
abababababababab	low
3) abcdfghhgfdcba	high
abababababab	low
4) abababababababababbabababababababababa	high
abababababababababababababababababab	low

In one line, the H&L theory would always favor more intricate patterns, in contrast to intuition which would suggest that simpler patterns are actually better-formed. To evaluate this intuition, we conducted two experiments where the above sequences were mapped onto simple arrangements of dot patterns (Figures 2 and 3). In all cases, the results were inconsistent with the predictions of the H&L theory, while the intuitive simplicity of the stimuli used was a much better indicator of their figural goodness. This suggests that H&L's theory may not be an accurate account of figural goodness.

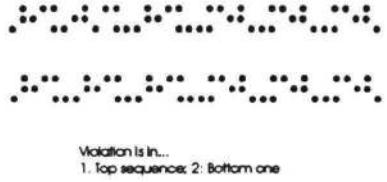

Figure 2: An example of a trial in Experiment 1. The sequences above were mapped onto arrangements of dots, as shown. In each pair, the two sequences were identical, but for one violation of regularity in one of the sequences. We assume that the speed in identifying the violation would be a measure of figural goodness.

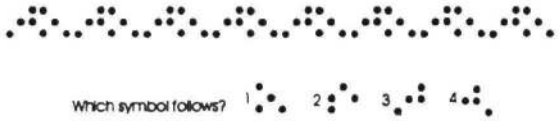

Figure 3 A typical trial in Experiment 2. The sequences were shown individually and the task was to predict the next "dot-symbol" in the sequence. The assumption here is that the faster participants can parse the regularity in the sequence, the higher its figural goodness.

References

Helm P A van der, Leeuwenberg E L J, 1996 "Goodness of visual regularities: A non-transformational approach." *Psychological Review, 103,* 429–456.