

# A note on "Some artifactual causes of perceptual primacy"<sup>1</sup>

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This note evaluates the conclusion of Ayres (1966) that the evidence of Harcum, Hartman, and Smith (1963) for a perceptual scanning mechanism was produced by certain experimental artifacts. The conclusion is that the proposition of experimental artifact is not justified by the data which Ayres presented.

Recently Ayres (1966) published results which he interpreted as obviating the postulation of a perceptual scanning mechanism, such as the one Harcum, Hartman, & Smith (1963) inferred from an asymmetrical distribution of errors in the reproduction of individual elements within tachistoscopic binary patterns. Ayres argued that the unequal accuracy in opposite hemifields—so-called perceptual primacy—was an experimental artifact, accounted for completely by the order of reporting elements, pre-exposure set, and eye movements. Despite his contention, however, Ayres has *not* demonstrated an artifact in the experiment of Harcum et al, from which the perceptual scanning was inferred to favor stimuli in the left visual hemifield. The existence of an artifact is established only when the positive effect is *eliminated* by controlling a variable which was inadequately controlled in the original investigation. Ayres merely performed an experiment which was very similar to the previous one. In both experiments two techniques for controlling for overt order of report were used, and a device to restrict fixational errors was employed. Also, instructions about the required order of report were given before exposure. Ayres concluded that his results were negative with respect to the possibility of perceptual scanning, because there was no overall difference between hemifields which remained to be explained. Such discrepancies in conclusions from similar experiments are not uncommon in psychological research, but usually the onus falls on the challenger to show that his negative conclusions are the product of a more careful experiment. However, since Ayres' negative results and conclusions have appeared in print, a critical examination of them also should be published.

Although it is not particularly germane to the present argument, it should be pointed out that the existence of the proposed perceptual scanning mechanism should not be disclaimed on the basis of one negative experiment. The perceptual scanning hypothesis does not require, for example, that a hemifield difference be observed under all conditions, or that it always

favor the left hemifield when stimuli are exposed across fixation (Harcum, 1964). Moreover, not all of the positive evidence comes from the Harcum et al experiment (e.g., Sperling, 1960).

## Analysis of Results

When the effect of order of report was controlled by requiring the Os to respond from left to right on some exposures and from right to left on an equal number of other exposures, Harcum et al concluded that there was a general bias favoring accurate reproduction for the elements on the left of fixation. Ayres concluded that his results did not show a greater primacy effect with left-to-right reproduction than with right-to-left responding. Nevertheless, the empirical difference which he obtained actually favored the stimuli in the left hemifield. In other words, Ayres' result is negative only in the sense that the overall difference between hemifields was judged to be not significant.

Both Ayres and Harcum et al also used a second method to control for the bias due to order of response. They required the Os to begin some reproductions of the stimulus-pattern on one of the central elements, adjacent to fixation, and proceed outwardly, responding alternately on right and left. Thus, the temporal primacy of the response decreased with the increased eccentricity of the element, with only slightly different degrees of primacy for the stimuli in the two hemifields in each reproduction. Again Harcum et al concluded that the left hemifield was significantly more accurate, but Ayres reached the

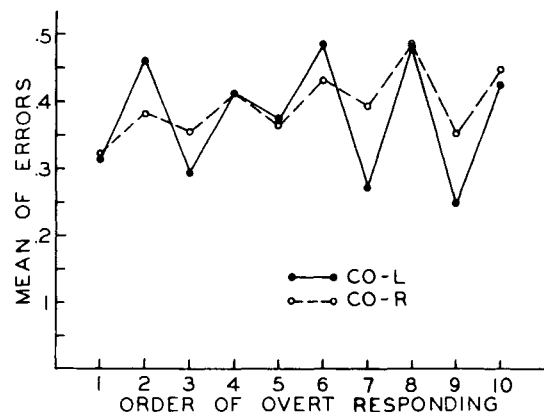


Fig. 1. Means of errors under CO-L and CO-R conditions for elements designated according to their order of reproduction, after Ayres (1966).

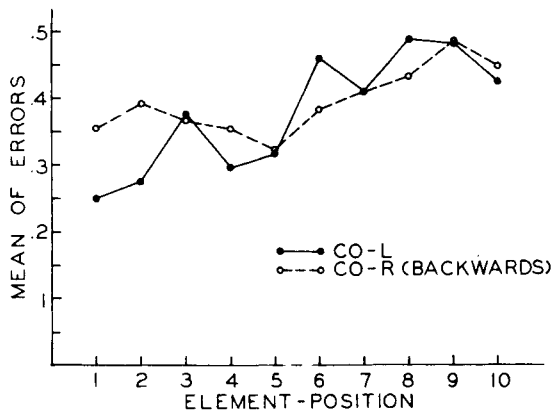


Fig. 2. Means of errors for elements numbered from left to right for the CO-L condition, and right to left for the CO-R condition, after Ayres (1966).

negative conclusion. However, there are two ways of plotting his data which Ayres did not show, but which imply that there is in fact a difference. Figure 1 shows the means of errors reproduced from Ayres' graphs of the center-out responding conditions, plotted for the individual elements according to their order in the responding sequence. The conditions in which the first response is on the left (CO-L), or right (CO-R), are presented separately. The results are surprising since the perceptual accuracy for the individual elements under these conditions reveals little relation to their order in the overt reporting sequence. The "sawtooth" character of the function is due to the laterality of the elements; the dips are for stimuli on the side which was marked first. Actually, the relative superiority of performance for CO-L and CO-R conditions tends to reverse as the laterality of the response is alternated, generally with fewer errors for the elements in the left hemifield.

Comparisons at six of the ordinal positions show superior accuracy for the element in the left hemifield, while only three comparisons show superiority in the right hemifield, and one shows equality between hemifields.

Figure 2 shows a comparison of these same results of Ayres in terms of the spatial position of the elements, plotted from left to right for CO-L and backwards for CO-R. The greater differential between hemifields with the CO-L reporting is clearly noticeable, reflecting the favorable bias in accuracy for the stimuli on the left.

#### Conclusions

Ayres did in fact corroborate the empirical results of Harcum et al. The point of disagreement is merely whether or not the empirical difference between hemifields in each of the two studies is statistically significant. The argument of the present note is that the probability value associated with the difference in the "negative" experiment cannot stand alone as the basis for a conclusion, particularly when that choice implies acceptance of the null hypothesis.

#### References

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#### Note

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