

References

- Estes, W. K. The statistical approach to learning theory. In S. Koch (Ed.), *Psychology: A study of a science*. Vol. 2. New York: McGraw-Hill, 1959. Pp. 380-491.
- Luchins, A. S. Mechanization in problem solving: the effect of Einstellung. *Psychol. Monogr.*, 1942, No. 54 (Whole No. 248).
- Restle, R. A theory of discrimination learning. *Psychol. Rev.*, 1955, 62, 11-19.

Notes

1. Based upon a thesis submitted in partial fulfillment of the requirements for the M.A. degree at Indiana University.
2. Now at the University of Kansas.
3. Formerly at Indiana University.

Comment on "Adaptation of humans to colored split-field glasses" by John C. Hay and Herbert L. Pick, Jr.

Recent studies (Harrington, 1965; McCollough, 1965) have failed to confirm the gaze-contingent after-effects of split-field color spectacles (Kohler, 1964, 1962). McCollough has further shown how Kohler's observations may have been due to artifacts in his test procedure. However, another kind of gaze-contingent after-effect reported by Kohler has been replicated: the gaze-contingent after-effects of prismatic distortions of form (Pick & Hay, 1964; Pick & Hay, in press). It would seem, therefore, that gaze-contingent after-effects do exist, for distortions of form, but that Kohler's conditioning theory of those after-effects is in doubt, since it predicts that similar gaze-contingent after-effects should occur for distortions of color (Kohler, 1964, pp. 16, 26, 123 et seq.).

Why should form perception come under the control of eye position while color perception does not? It seems possible that the influence of eye position on form perception is only a modification of a normally existing relationship between the two. For example, when the head is turned, the eyes turn in a reflex fashion, which normally helps keep a constant image on the fovea. The prism makes this reflex eye movement inadequate for preserving the foveal image, since the prismatic displacement changes with the viewing angle through the head-fixed spectacles. Thus when Swearing base-left prisms moves his head down, horizontal

image lines are tilted counter-clockwise. Adaptation to this distortion could involve a modification of the reflex eye movements, such that they acquire a torsional component partially cancelling the prism-produced image rotation. Recent evidence supports such an explanation: Hay & Pick (in press) found that vertical image lines are affected similarly to horizontal image lines by the adaptation, whereas the prisms differ in their effects on vertical and horizontal lines.

By contrast, the split-field color distortions have no natural relation to eye movements. Eye movements could in no way counter-act the change in image color caused by these spectacles. If gaze-contingent color after-effects developed, it would mean that an entirely novel mechanism had developed, relating the color response of the visual system to eye posture.

In terms of this analysis, the gaze-contingent after-effects which do occur, those to prismatic distortions of form, represent a modification of an already existing relationship, rather than the "conditioning" of a new relationship. This means that they do not support Kohler's theory that "the visual system (is open) to the influence of a wide range of other sensory or sensorimotor conditions, provided only that they are marked enough, and that they regularly coincide with a specific visual stimulus" (Kohler, 1964, p. 16). Instead, the present analysis makes gaze-contingent adaptation comparable in nature to other, gaze-invariant after-effects: adaptation is a change in an existing mechanism due to atypical stimulation of that mechanism.

References

- Harrington, T. L. Adaptation of humans to colored split-field glasses. *Psychon. Sci.*, 1965, 3, 71-72.
- Hay, J. C., & Pick, H. L., Jr. Gaze-contingent adaptation and prism orientation. *J. exp. Psychol.*, in press.
- Kohler, I. Experiments with goggles. *Scient. Amer.*, 1962, 206(5), 63-72.
- Kohler, I. The formation and transformation of the perceptual world. *Psychol. Issues*, 1964, 3(4), Monograph No. 12, 173 pp.
- McCollough, Celeste. The conditioning of color perception. *Amer. J. Psychol.*, 1965, 78, 362-378.
- Pick, H. L., Jr., & Hay, J. C. Adaptation to prismatic distortion. *Psychon. Sci.*, 1964, 1, 199-200.
- Pick, H. L., Jr., & Hay, J. C. Gaze-contingent adaptation to prism spectacles. *Amer. J. Psychol.*, in press.