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BOOK REVIEW SECTION

Visual Psychophysics. Handbook of Sensory Physiology, Vol. VII, pt. 4. Edited by Dorothea Jameson and Leo M. Hurvich, Department of Psychology, University of Pennsylvania, U.S.A. Berlin: Springer-Verlag, 1972.

Visual Psychophysics binds 31 major contributors to the literature of several disciplines into 28 discrete chapters that cover a wide variety of topics in a total of 812 pages. It includes a collection of the more basic problems, e.g., adaptation, absolute and difference thresholds, acuity, flicker, induction, scaling, etc; some special phenomena, e.g., Mach bands, metacontrast, Stile-Crawford effects, electrical measures, etc.; and ten chapters on color vision. This spectrum of interests defies authoritative review by one person. Consequently, evaluation is limited and subject to reviewer's bias.

The editors' preface states that "*Visual Psychophysics* documents the current status of research aimed toward understanding the intricacies of the visual mechanism and its laws of operation in intact human perceivers." They hope that the book "will inform graduate students as well as other visual scientists about the current status of the issues that are engaging the attention of the psychophysicist today, and that it will provide both the background and the challenge to those who may want to contribute their own expertise to the continuing research." (p. V). As parts of these statements are satisfied by some of the chapters, but all of them by none of the chapters, one wonders how much they were stimuli for or responses to all of the chapters.

Virtues of an interdisciplinary authorship for the varied compendium will be obvious to the reader where the subject matter fits the rubric "psychophysics." While no explicit editorial definition of psychophysics is given, D. S. Blough and D. Yager, in their chapter on animal research, regard it for both humans and animals as "the study of relations between stimulus variables (usually of a highly restricted sort) and simple responses (even more restricted)." (p. 732). Narrower and broader views of psychophysics exist. However, all conceptions imply a "normal" or "intact" perceiver. The study of abnormalities in vision may assist us in understanding visual functions – certainly when related to that of the normal. E. Aulhorn and H. Harms take a large step in this direction with their lucid

account of visual perimetry. Likewise, L. M. Hurvich emphasizes the relevance of color vision deficiencies for color theory. On the other hand, the clinically oriented chapters on genetics of congenital color deficiencies and on acquired color vision defects belong in a book on the pathology of vision and not in one on its psychophysics.

On the whole, this book keeps one abreast of advances through the late 60's. Most of the chapters appear to have been completed between 1969-70. The references for H. R. Blackwell's excellent discourse on luminance difference thesholds imply no significant findings after 1967. Only two chapters note their date of completion. It is an editorial contradiction to omit the dating of chapters while stressing the up-to-date status of the book's content. Additions in proof should have been encouraged and perhaps required. For example, M. Alpern's chapter on eye movement omits coverage of large eye movements but notes that "the proceedings of a very recent symposium on *Control of Eye Movements* should be available in the near future." (p. 311). This 1969 symposium had already been published (Bach-y-Rita, Collins, and Hyde, 1971). Other more recent information may be found in specialized sources, such as the chapter on color vision in the *Annual Review of Psychology* (Walraven, 1972). Some gaps in the material covered may be more apparent than real, but this is difficult to assess. The reader is steered in a very general way to relevant material through cross-references to other chapters in this book and also to those in the other parts of this volume in the series, i.e., photochemistry, receptor physiology, and central information processing.

Psychophysical methodology vis-à-vis some dimensions of stimuli are viewed in depth from the differing perspectives of signal detection theory, psychometric scaling procedures, and operant conditioning procedures with animals. However, the extent of methodological considerations varies across phenomena. Thus, E. Baumgardt prefers a temporal forced-choice method for measuring absolute threshold, H. R. Blackwell describes its use in examining the effect of luminance upon its difference threshold, and R. M. Boynton analyzes its shortcomings for two-pulse resolution thresholds. Elsewhere, the interface between method and result with implication for theory is either omitted or handled cursorily. Sorely needed is an integrated treatment of methodology for the psychophysics of visual stimuli. In a similar vein, it would have been helpful to include current material on the standardization of our arbitrary definitions of stimuli, with transformation equations to handle the conversions between photometric and radiometric expressions that vary from chapter to chapter (cf. Judd, 1951).

These are rather basic omissions; it is only possible to briefly indicate some other scotomata that may be welcomed by some but not by others.

Understanding of present work on a problem is, in large part, dependent upon its history. This aspect is covered, with few exceptions, in meager introductions. And today, with greater recognition of the role of science in the solution of society's problems, it is important to clarify linkages between the so-called "pure" and "applied" research efforts. Apart from an occasional comment, the possible significance of findings for applications to practical problems are not elaborated. Some of the psychophysical results are surely relevant to "reading" skills. There are also large areas with unfinished tasks in the psychophysics of vision. For example, the development of visual sensitivities from infancy onward offers unexplored and provocative problems (cf. Pick and Pick, 1970). Some attention to these and other topics may have provided greater background and challenge to continuing research.

I do not wish to give the impression that this book is half-empty rather than half-full. In fact, my adaptation level was adjusted to the $78.70 price tag on this tome. The formal attributes — a questionable usage of two grades of paper, full repertoire of typographical errors, achromatic figures, etc., — do not justify the cost, and this raised my expectations for the substantive material. Analysis of problems are, perhaps, too intensive for the student but not sufficiently so for the specialist. It is an in-between type of book that may appeal most to the psychophysicist working in one area who wishes to become informed of the other areas. In general, sophisticated treatments of technical problems in the psychophysics of vision are presented with uniform high readability.

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REFERENCES

Bach-y-Rita, P., Collins, C. C., & Hyde, J. E. (Eds.) *Control of Eye Movements.* New York: Academic Press, 1971.

Judd, D. B. Basic correlates of the visual stimulus. In Stevens, S. S. *Handbook of Experimental Psychology.* New York: Wiley, 1951, Chap. 22.

Pick, H. L. Jr., & Pick, A. D. Sensory and perceptual development. In Mussen, P. H. (Ed.) *Carmichael's Manual of Child Psychology.* New York: Wiley, 1970, Vol. I, Chapter 11.