

Draft version of manuscript published as above

Book review

By WINAND H. DITTRICH

University of Hertfordshire, Hatfield, Hertfordshire, UK (email: w.dittrich@herts.ac.uk)

Andre, J., Owens, D. A., & Harvey, Jr., L. O. (Eds.). (2003). *Visual perception: The influence of H. W. Leibowitz*. Washington, DC: American Psychological Association. Pp. 320. ISBN 1–55798–945–1. Price \$49.95 (Hbk).

In the edifice of visual psychology there are many mansions. This book comes from one of the finest in it. The influence of Herschel Leibowitz has been immense (e.g., teaching in four languages and publishing more than 250 papers) blending rigorous inquiry with inspirational teaching and dedicated public service. This “Decade of Behavior” festschrift is exemplary in many respects, such as giving a readable account of complicated vision problems, as bridging applied and theoretical questions, as to the productiveness of cross-disciplinary collaboration, and, last but not least, to the significance of an inspirational teacher, mentor, and colleague. Reading the book will give you a kind of immersion experience, typical in style of the man himself. The book primes the pump and lets the reader go on an inspirational journey.

Why is it important? No matter: there is nothing like a radically new angle of vision for bringing out unsuspected dimensions of a subject, and that is what Herschel Leibowitz has done—brilliantly supported by his students and collaborators, as confirmed in plenty of cases in this book. Contrary to Leibowitz’s scepticism some 30 years ago about the quality of most perceptual studies, the work reported here seems exemplary in theoretical strength and experimental design. The breadth of his influence is shown in the titles of the seven book sections with, generally, two chapters in each: (1) “A symbiosis of science, service, and mentorship”; (2) “Integrating basic and applied research”; (3) “Clinical applications”; (4) “Accommodations”; (5) “Interactions with visual information”; (6) “Traffic safety”; and (7) “Perceptual applications to other disciplines”. The depth of his influence is graspable in each of two section chapters.

Section 1 (“A symbiosis of science, service, and mentorship”): Leibowitz’s approach to psychological science is splendidly and, at the same time, most dramatically highlighted by three of his former students—the book editors (chapter 1). On three pages they manage to bring light to Leibowitz’s most fascinating “first law” of vision: a “law” fascinating in its simplicity and, at the same time, embodying several subtle lessons about perception. One of them is that it is most useful to think in practical terms and therefore acknowledge the interplay of basic insight and applied questions; these are at the heart of his tireless search for solutions. As I introduce my lectures on visual perception with Locke’s demonstration of the illusion of touch temperature, reading the festschrift convinced me to add Leibowitz’s “first law” of vision as second demonstration—if my safety officer approves, I have to say. In the next chapter, a former student (Shepela) summarizes his exemplary contribution as mentor absolutely intriguingly covering the areas of teaching, scholarship, and personal life. Reading about his guiding principles for

mentoring, skilfully packaged as six instructions, provides a refreshing reminder of the real purpose of education. As mentor, he attracted the greatest esteem and gratitude from his students by empowering them to make their own contributions and developments, not least through his modest and most engaging as well as encouraging style setting the standard.

Section 2 (“Integrating basic and applied research”): Chapter 3 consists of a reprint of his most stimulating paper as part of a Distinguished Scientific Award of APA in 1995 on “The symbiosis between basic and applied research”. If one wishes to learn about the sources inspiring the man himself, here one finds valuable information, not least the name of Erich von Holst, one of the greatest scientists in German post-war history who was equally fascinated by the practical aspects of science. Describing research on the problem of night myopia, for the first time, empirical evidence was presented that the eyes tend to focus towards an intermediate, highly individual, resting position. Investigating possible reasons for the much higher frequency of night-time traffic accidents, it became clear that only a new perspective of viewing the problem would lead to a possible answer, leading to the not only brilliant but also practical notion of the selective degradation of vision. This means that under conditions of reduced illumination, you might still be able to walk without problems, but reading might be considerably impaired. In chapter 4 the use of Signal Detection Theory (SDT) to solve real world problems is emphasized (Harvey). The simple idea presented here is that probability distributions can be seen as a model for noisy internal representations, to be combined with decision criteria for generating responses. It is suggested that such a framework for psychological processes has great predictive power and widespread applicability. Combining controversial claims, such as the absence of sensory thresholds, with highly elucidating statements about the need for psychological models, such as the importance of uncertainty as construct and then the exact modelling of response functions, leads to a most fascinating mixture about the applicability of SDT to human judgements in general. The reader should not miss out learning what detecting faint visual targets, forecasting severe weather, and detecting liars by polygraph operators have in common. From a psychological point of view, the use of probability density functions allowing for variable decision criteria compared to the standard yes/no criterion seems noteworthy. Furthermore, this is a fascinating example of a highly readable chapter, despite the unavoidable use of a few mathematical functions and graphs.

Section 3 (“Clinical applications”): How the challenge of understanding visual illusions can be used productively and the use of illusions to help to detect glaucoma and other eye diseases is the topic of a nice chapter 5 (Johnson). The principles and usefulness of Frequency Doubling Technology perimeter as a screening technique taking a few minutes to detect several eye disorders is nicely illustrated. Leibowitz’s enthusiasm for solving mysteries and his fascination for the historical context are highlighted in chapter 6 on the earliest known lenses (Enoch). The author describes not only the fabrication and use of lenses in Egypt, made of very high-quality rock crystal as early as ca 2,500 BC, but also how he has duplicated these Egyptian lenses.

Section 4 (“Accommodations”): A lesson in how an initially fashionable spending of leftover grant funds can be turned into a most unexpected research instrument—here the laser optometer—and a description of the controversies concerning the resting state of accommodation, also called the dark focus of accommodation or tonic accommodation, are given in chapter 7 (Andre). This research confirmed that the eye’s resting state of accommodation seems located at an intermediate distance and that the exact distance of that location is variable and is affected by cognitive factors such as mental effort or attention.

The dark focus in accommodative behaviour under a variety of conditions still seems to open up many so far unsolved questions. As summarized in chapter 8 (Held et al.), a potential link between a presumed genetically determined feature (early astigmatism) and an environmental interaction (visual exposure to lines) seem to codetermine the development of a visual function, like the oblique effect.

Section 5 (“Interaction with visual information”): The longest article is reserved for a fascinating chapter on the question of how we misperceive extents in the medial plane (Crassini, Best, & Day). Here it is shown how the understanding of a visual illusion (here Shepard’s Table Illusion), surely based on Gregory’s misapplied-constancy explanation, can be used to generate instructive empirical research on the perception of road signs in motor traffic viewed from different angles. Furthermore, the chapter is a fine demonstration that complex visual stimulation, as in size-depth illusions, might not trigger just one perceptual mechanism, such as size constancy. Alternatively, one might assume that different processes are involved, here perceiving the length of lines leading to extra perspective cues, then used in size-depth judgements. Solving the illusion mystery of the “Mystery Spot” in California seems also the theme of chapter 10 (Guzy, Cohen, & Ebenholtz) when the perceptual effects associated with rolled, pitched, and yawed visual frames are investigated (Don’t miss Figure 10.1!). The authors favour a field-dependence account as a possible solution. But, as for most other chapters, I want to mention that not only the empirical evidence but also the whole presentation of the evidence seems highly entertaining. Leibowitz’s work has strongly been influenced by the “two visual systems” hypothesis, and therefore it seemed most appropriate to briefly review the two modes of information processing in chapter 11 (Post, Welch, & Bridgeman). Particularly, the perception–action relationship is emphasized, and studies on visual illusions are evaluated for their validity of claiming a dissociation between perception and action. In an otherwise extremely well edited book, the essential figure (11.1) unfortunately seems distorted and unreadable.

Section 6 (“Traffic safety”): In highly instructive chapters on traffic safety, Leibowitzian principles—such as usefulness of psychology, and intimate relationship between research, teaching, and service efforts—are demonstrated most convincingly. Owens (chapter 12) gives a very fine account of the degradation hypothesis of vision and presents their empirical findings on visual guidance depending on visibility before Tyrell and Patton (chapter 13) teach us a wonderful lesson in pedestrian education. It is noteworthy to mention, nowadays, that only exposure to the actual lecture resulted in an educational benefit; the video demonstration of the same content did not have the same effect.

Section 7 (“Perceptual applications to other disciplines”): In chapter 14 (Stern) the role of optokinetic stimulation to provoke nausea, as well as applied studies on the latter, are discussed, summarizing physiological and behavioural aspects. It is a delight to read about the applied aspect of vision in chapter 15 (Cavanagh&Higginson). The role of vision during locomotion—more precisely, during stair descent—is described: not only are different behaviours made evident in different regions of the stairway, but the importance of strategies and adaptation is also highlighted. Safe stair negotiation seems not as trivial a task as one might assume, and the lighting conditions are crucial. Surely, the interaction of perception and action cannot be demonstrated more prominently.

The quality of this publication is of a high and laudable standard. Although the style is very accessible, if they wish, readers can—in contrast to many popular science books on the market—easily trace the original sources. However, this is not essential for comprehension. The figures never fail to add to the text,

and the number of illustrations never seems superfluous. The lay-out is noteworthy in its simplicity and its beauty.

This book provides a thorough and fascinating insight into the work and life of Herschel Leibowitz. There can be no doubt that the whole area of visual perception, but also psychology in general, has been enriched tremendously by his contributions and attitudes towards not only the material itself but also its dissemination to other students and researchers in general. The book describes his contributions in a manner that is not only detailed but also easily comprehensible to a wider audience—the popularising of knowledge at its best. In this way, it is hoped that his exemplary approach has been passed on to a new generation not only of perceptual psychologists but also of behavioural researchers in general. A joy to read!