
Obituary



Walter H Ehrenstein (1950–2009)

Walter H Ehrenstein, known for his research in the field of visual and auditory perception, died on 30th January 2009, following a long illness. He was 58 years old.

Those who met Walter at the *European Conference on Visual Perception* might have been convinced that his main field of research was in visual perception. The spectrum of Walter's research interests, however, was wide-ranging and varied. As indicated in the *NeuroTree* (<http://neurotree.org/neurotree/peopleinfo.php?pid=17975>), "his publications concern neuroscience (audition, proprioception, vision), its ergonomic applications (endoscopic systems, perception–action compatibility, virtual depth), and theoretical (Gestalt) accounts".

Walter H Ehrenstein was born in Heidelberg, Germany, in 1950, the son of Marianne Johanna and Walter Ehrenstein. Walter Jr was raised in Giessen where he attended a humanistic gymnasium. He went on to study ethology, physiology, and psychology at the universities of Giessen and Göttingen.

Following his graduation, from 1974 to 1977 Walter was a PhD student of Otto Creutzfeldt, the prominent neurophysiologist, in the Department of Neurobiology at the Max Planck Institute for Biophysical Chemistry in Göttingen. A young researcher, as Walter once remarked, could hardly find a better intellectual atmosphere for fostering his creativity, excitement about exploring the unknown, and critical thinking—which spawned from lively debates with an interdisciplinary mingling of collaborators and international guests. For his thesis *Psychophysics of Direction-specific Aftereffects in Auditory Motion Perception* Walter obtained in 1977 his doctoral degree (Dr rer. nat. in psychology, physiology, and zoology) from the University of Göttingen.

In 1977–1978, on a post-doctoral fellowship, Walter worked with Robert Galambos in the Neuroscience Department at the University of California San Diego. Following his

year overseas, he returned to Germany, taking a research assistant position at the University of Constance and then moved to the University of Freiburg (1980–1985) to work with Lothar Spillmann.

In Freiburg, the focus of Walter's research was on temporal characteristics of visual processing. In particular, he showed that brief light flashes could be more easily discerned than equally long dark pauses, thereby suggesting an asymmetry between the neuronal subsystems for brightness and darkness (Ehrenstein and Spillmann 1983). Later, in a clinical study he demonstrated, using a psychophysical procedure, that in patients with clinically suspected multiple sclerosis, the early stages of the disease could be diagnosed by the significant increase in interocular latency difference (Ehrenstein et al 1985).

It was also in Freiburg that Walter met Munehira Akita and Jiro Hamada, an event that ignited Walter's appreciation of Japanese science and culture, which was reinforced during Walter's subsequent visits to Japan as a guest scientist (1992, 2005). It was natural that when a special issue of *Gestalt Theory* on "Perceptual research in Japan" was conceived, Walter was invited to serve as its Guest Editor (Ehrenstein 2008).

In 1985, Walter accepted a tenured position in the Department of Sensory- and Neurophysiology (C Richard Cavonius, director) at what is now the *Leibniz Research Centre for Working Environment and Human Factors* in Dortmund, where he worked till his death.

In his first Dortmund years, Walter focused on investigating stimulus–response (SR) compatibility by varying the spatial relationship of S and R (eg Ehrenstein et al 1989) while trying to understand the underlying spatio-anatomical mapping. Later, when Walter embarked on research into visual motion, he linked these two areas of interest by studying SR compatibility and the Simon effect for real visual motion. He demonstrated strong compatibility effects for both position and direction of motion, and suggested that the orienting of attention required for the Simon effect to occur is triggered by the saccade, not the pursuit, programme (Ehrenstein 1994a).

With Hohnsbein and Mateeff, Walter engaged in investigating mechanisms of directional sensitivity in motion perception (Mateeff et al 1991). In the following years, utilising these findings, jointly with Wist and Schrauf, he developed the Düsseldorf Test of Dynamic Vision (DTDV). In a computer-generated random-dot display, a completely camouflaged Landolt ring becomes visible when dots within the target area are briefly moved, while those of the background are kept stationary. Detection of gap location relies on motion contrast, or on form-from-motion (Schrauf et al 1999). The DTDV was applied to large populations of all ages (Wist et al 2000) and various professional and clinical groups. It also became part of the visual psychophysics battery (see http://visionscience.com/documents/strasburger_files/strasburger.html).

In parallel to his research in vision, in Dortmund Walter also took up his earlier studies on auditory perception, investigating, in particular, auditory aftereffects produced by simulated motion (Ehrenstein 1994b). This line of research was then extended to address an interaction between auditory and visual modalities, specifically cross-modal spatial integration. With Lewald, he engaged in a series of studies on sound localisation dependent on eye position; these demonstrated a shift of the subjective auditory median plane in the direction of eccentric gaze (eg Lewald and Ehrenstein 1998). Further factors influencing spatial integration were explored to show shifts in perceived egocentric direction induced by eccentric head position and transcutaneous neck-muscle vibration (eg Lewald et al 2000).

Another of Walter's interests were geometric-optical illusions—a 'passion' apparently inspired by the work of his father, the renowned German Gestalt psychologist, after whom the Ehrenstein illusion was named (Ehrenstein 1941). This line of his research, pursued in numerous and multinational collaborations, examined, among others, the Ebbinghaus illusion (Ehrenstein and Hamada 1995), the Munker–White effect in stereovision (Taya et al 1995) and the scintillating Hermann grid (Lingelbach

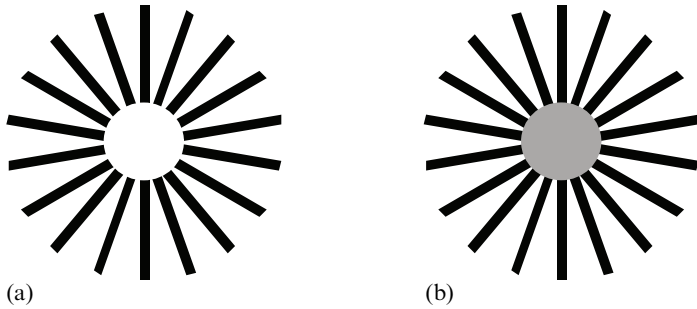


Figure 1. (a) A variant of the Ehrenstein figure. Dark radial lines produce an illusion of a bright circular patch filling the central gap. (b) Scintillating lustre. By filling in the central gap with a grey disk, illusory brightness gives way to a perception of glossy shimmer. The scintillation is considered to result from the competition between an illusory increment, ie the line-induced brightness, and a physical decrement, the dark grey of the disk (Pinna et al 2002).

and Ehrenstein 2002). A study of scintillating lustre in the Ehrenstein figure closed a circle with his father's work on brightness illusions (Pinna et al 2002—see figure 1). His last study, performed in collaboration with Wagner and Papatthomas, investigate vergence of eye movements in response to veridical and illusory depth (Wagner et al 2009).

As a psychophysicist and psychophysicologist, Walter was very knowledgeable about methods and approaches in these disciplines. The chapter on psychophysical methods (Ehrenstein and Ehrenstein 1999) is an example of clear and concise writing and is always on the list of assigned reading in my own undergraduate class on psychophysics. Importantly, Walter had a profound understanding of methodological problems in neuroscience and in his review papers elaborated on the (recently revived) distinction between 'outer' and 'inner' psychophysics as introduced by Gustav Theodor Fechner.

Being an avid reader and having been exposed to Kurt Gottschaldt in Göttingen, Walter was unparalleled in his understanding of the history and theory of Gestalt psychology. With Spillmann, he co-authored several reviews of the neurophysiological correlates of Gestalt phenomena, including a seminal chapter in *The Visual Neurosciences* (Spillmann and Ehrenstein 2004). His conference talks—in Graz, Austria (2005) on "Phenomena in search of brain functions: From inner psychophysics to correlational neuroscience" and in Zadar, Croatia (2008) on "Gestalt approaches to visual neuroscience"—were in this vein. One of his last papers examined the role of Leibniz's philosophy in holistic psychology and correlational brain research.

During his time in Dortmund, Walter held additional appointments as an adjunct professor at the universities of Bielefeld, Düsseldorf, and Wuppertal. He was a visiting scientist at the Academy of Science, Sofia, Bulgaria, the Kyoto Institute of Technology, the University of Tokushima, Japan, and the University of Sassari, Italy. Walter was a frequent reviewer for *Perception*; also, he was elected an Editorial Board Member of *Gestalt Theory* in 2005 and of the *Journal of Integrated Social Sciences* in 2008.

Publicly, Walter was a keen observer and a critical commentator, although reserved and quiet. The continued research on his father's (1941) illusion, vis-à-vis the Kanizsa triangle, gave him great satisfaction. His extensive knowledge of the literature, his conceptual strength and unflinching memory enabled him to see relationships between old and new, to suggest associations across sensory modalities and to draw comparisons between academic disciplines. His articles show him as a rare scholar. He readily combined phenomenological observation with psychophysical measurement, neurophysiological interpretation, and clinical application. Walter always found ways of embarking on interesting and productive research, sometimes with dedicated colleagues from far away, and excelled despite the odds.

As Walter's former departmental colleague in Dortmund, I would like to share a few personal impressions. When we worked on joint papers, from his deep erudition he often provided me with an interesting association or rare reference, which showed the problem under consideration within a new context. Long telephone conversations sparkled with unexpected scientific and personal insights. When he spoke, he did so in a halting and soft voice. In private, his shyness gave way to spontaneity, enthusiasm, and a fine sense of humour. He was a loyal friend to many and an inspired and inspiring companion. Walter, a wayfarer in the field of perceptual neuroscience, has gone, but his memory will endure.

Walter H Ehrenstein is survived by his wife, Rabiana, an acclaimed pianist, and their 16-year-old daughter, Anna.

A list of selected publications by Walter H Ehrenstein is provided by Lothar Spillmann (2009); full bibliography is available at <http://www.ifado.de/en/profile/staff/Ehrenstein/index.php> (see "additional publications" on the right).

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