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Haber, Ralph Norman

Born: 1932, Lansing, Michigan, USA. *Nat Americ Info:* Experimental psychology, teaching of psychology. *Educ:* BA University of Michigan 1953; MA Wesleyan University 1954; PhD Stanford University 1957. *Appts & awards:* Professor, Department of Psychology, University of Illinois at Chicago; Fellow, APA Division 3, 1970 , APA Division 2, 1983, AAAS, 1971– ; Outstanding Achievement Award, University of Michigan, 1977; Fellow, New York Academy of Science, 1980– , Institute of the Humanities, University of Illinois, 1984–5; Advisory Editor, *Experimental Psychology Series*, 1969–78, *Handbook of Psychology*, Academic Press, 1973–8; Editorial Board, *Psychologische Forschung*, 1973–80, *Acta Psychologica*, 1973– , *Journal of Mental Imagery*, 1977– , *International Mental Imagery Review*, 1980– , *Journal of Visual/Verbal Languaging*, 1981– , *Developmental Neuropsychology*, 1984– , *Journal of Experimental Psychology, HPSP*, 1985–8

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Although Haber was interested in questions of perception, his interest was submerged by David McClelland at Wesleyan at the height of his creativity in motivation and personality. Haber took up studies in this area and eventually edited a book of seminal papers in this field. He continued to pursue these topics during his graduate work, at Stanford, because, as he states, 'Stanford had no one involved in perceptual science at that time.' Nor was anyone doing perceptual science at Yale, the venue of his first teaching position. Haber's sources of influence came not from direct contact, but from the seminal leaders in the field, such as Broadbent, Sperling, Neisser, Kahneman, Kolers and Posner. These scientists, with Haber and others, moved a traditional behaviouristic experimental psychology to one of information processing and, ultimately, to cognitive science during the last decades. As with these other scientists, he felt that he was on the leading edge of a revolution of thinking and experimentation.

Haber moved to Rochester in the middle 1960s as a member of the Center for Visual Sciences, initiated by Robert Boynton. This move clearly solidified his position in the study of perceptual science. With these colleagues, Haber was able to learn from the best minds in the field, and he accomplished an information-processing approach to the study of visual perception. After a few decades of productive scholarship, Haber, along with other leaders in this field, became disenchanted with this approach, and in particular the study of iconic memory. He views his paper 'The impending demise of the icon', published in *Behavioral and Brain Sciences* in 1983, as one of his single most important works. This is ironic because it is a paper that rejects much of his earlier work in the information-processing framework. He believes that the important aspect of this paper was that it fundamentally changed the nature of simple models to account for cognitive processing. In his view, the icon failed, but my view of Haber's early work is not so pessimistic, and I see his paper recasting this early work as one

that was unsplendid. His work in the early sixties, some of it in collaboration with Maurice Hershenson and Naomi Weisstein, set the stage for a systematic study of the temporal course of visual perception. His research is still highly relevant today, as psychology struggles with the relationship between perceptual reports and underlying psychological processes. He studied the effects of repeated brief exposures on the growth of a percept in which subjects actually reported a percept becoming clearer and clearer as short-duration display was exposed repeatedly, with long intervals between successive repetitions.

What was revolutionary about this work was that there is nothing in the visual system that could account for such a dramatic change in perceptual experience. I am not aware of any neural-network modelling that tries to account for this finding. He and Weisstein also traced the nature of backward masking in vision. They were among the first to uncover in the contemporary literature a U shaped backward masking function that could not be easily explained by a simple integration of visual information over time. This is a type of research that required something like a brief iconic representation in which a second stimulus would replace a previous one.

In the early 1970s, Haber began a lifelong collaboration with his marriage to Lyn Haber, whose background in linguistics complemented his areas of expertise. Their joint work also began to address real-world problems, including the study of spatial perception. Perhaps one of the most interesting projects was their design of a training programme for low-altitude flying for the Air Force. This research generated many other studies, such as the analysis of optimal strategies for operating railroad freight locomotives to maximize fuel and time on route and ultimately to the development of training programmes to teach engineers to drive trains. They also carried out task analyses of train dispatching and air traffic control and redesigned display equipment so that it meshed with the memory and processing demands of the dispatcher. With this type of expertise, the Habers could not stay out of the courtroom, and they have consulted and testified in a number of court cases involving perceptual and memory accuracy issues of witnesses and even judges. They have also done work with handicapped individuals, such as the development of orientation and mobility training programmes for the blind. This work created devices that were more responsive to the measured orientation and navigational abilities and skills of blind people, and eventually led to applications on the development of visual memory and orientation requirements for autonomous robotic devices.

The Habers and clearly the aspects that people in agencies would want to call on with these types of practical problem, because their roots are in the professional and theoretical knowledge of psychological enquiry, but they are not reluctant to apply these principles to the task at hand. The rewards come not only from solving particular problems; the applications reveal some understanding of the principles of human perception, memory, attention and related cognitive processes. Experimental scientists can always benefit from real-world experience; for example, the Habers' fighter pilots demonstrated to them that they could perform visual tasks while looking at the ground just a hundred feet below them passing by at a thousand feet per second, whereas this seems impossible to do on the basis of visual tasks from laboratory settings. What was the source of the discrepancy? In this case, laboratories use cathode ray tubes, or CRTs, that present the information intermittently, rather than continuously as the real world does. Although the perceiver does not notice this intermittence of information, it clearly degrades performance.

In summary, Haber's early research in visual perception was the prototypical centre of information processing research, looking at the nature of the effect of a set of perceptions, and the time course of perceptual processing. His more mature work provides a perfect exemplar of the productive interplay between basic and applied research. His life and work offer an ideal model and challenge for each of us.

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