

Fitts P M & Posner M I. *Human performance*.

Belmont, CA: Brooks/Cole, 1967. 162 p.

[Department of Psychology, University of Oregon, Eugene, OR]

Human Performance was a textbook designed to introduce students to a new field within psychology. The field involved the quantitative measurement of human capacities to perceive, attend, reason, and act. It was designed to serve as the basic science behind application of psychology to engineering design. [The *Social Sciences Citation Index*® (SSCI)® indicates that this book has been cited in over 180 publications since 1967.]

Michael I. Posner
Department of Psychology
University of Oregon
Eugene, OR 97403

February 2, 1985

Paul Fitts passed away almost 20 years ago. It is an appropriate recognition of his continuing influence that our book should be selected as a *Citation Classic*. Fitts was one of the generation of scientists called to service in World War II. The experience enlarged his vision about what psychology might be. He perceived a science of human capacities specified in objective, quantitative terms, that could serve as the basis for more reliable, appropriate, and humane technology. Artifacts of our industrial society could be made to serve human beings, if we could specify more precisely the properties of human thought and action. Fitts believed that psychologists and psychologically trained engineers would build an industrial field called human factors. The basis of that field would be a science of human

performance. The book that Fitts had outlined fully and for which he had written several chapters before his death was to be an introduction to the science. After he died, I was asked to complete the book.

Two features of the textbook have drawn the most attention. First, Fitts outlined a theory of learning that involved several definable stages, the last of which produced automated performance. If learning was measured by a continuous variable such as time per operation, a power function related practice to performance. The laws of automation¹ and theories underlying the power function² have remained important topics in the field and have cited Fitts's pioneering ideas. Second, Fitts described a quantitative theory of human movement control. The time to begin a movement was related to the uncertainty of the event and the compatibility of the codes relating stimulus to response, while the rate of movement was a function of the information it generated. A host of theoretical and empirical articles have built upon these ideas.^{3,4}

Fitts's general conception of an empirical science linked to application has gained renewed emphasis recently from the analysis of humans interacting with computers.⁵ Further, the recent commercial concern with artificial intelligence has fostered more interest in the nature of human capacities and limitations.

As a scientific field, human performance was one of the many strands contributing to modern cognitive psychology.⁴ In addition, the analyses of speeded tasks that Fitts did so much to develop have been used in conjunction with new spatial imaging methods and electromagnetic recording to explore theories of brain function underlying complex human performance.⁶

Fitts would certainly have been pleased had he known that his ideas would still provide a stimulus to theory and application so many years after his death.

1. Shiffrin R M & Schneider W. Controlled and automatic human information processing: II. Perceptual learning, automatic attending, and a general theory. *Psychol. Rev.* 84:127-90, 1977. (Cited 125 times.)
2. Newell A & Rosenbloom P S. Mechanisms of skill acquisition and the law of practice. (Anderson J R, ed.) *Cognitive skills and their acquisition*. Hillsdale, NJ: Erlbaum, 1981. p. 1-56.
3. Keele S W. *Motor control. Handbook of perception and performance*. New York: Wiley, in press, 1985.
4. Lachman R, Lachman J L & Butterfield E C. *Cognitive psychology and information processing: an introduction*. Hillsdale, NJ: Erlbaum, 1979. 573 p.
5. Card S K, Moran T P & Newell A. *The psychology of human-computer interaction*. Hillsdale, NJ: Erlbaum, 1983. 469 p.
6. Posner M, Pea R & Volpe B. Cognitive neuroscience: developments toward a science of synthesis. (Mehler J, Walker E & Garrett M, eds.) *Perspectives on mental representations*. Hillsdale, NJ: Erlbaum, 1982. p. 251-75.