FELLOW PROFILE

Human Factors and Ergonomics Society

Name:	Raymond S. Nickerson
Degrees, certifications, etc.:	PhD, Tufts University, 1965
Current status:	Retired from BBN; Research Professor, Tufts University
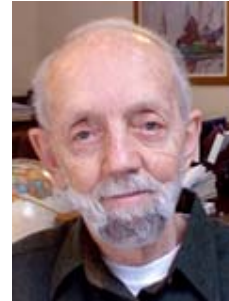
Biography (How you got involved in the field, your major career activities and milestones):

Getting involved in human factors was not the result of any planning, or even a conscious decision, on my part; I more or less stumbled into the area. While doing a two-year stint as a draftee in the U.S. Army, I decided I wanted to go to graduate school and study philosophy. When my stint was up, I returned to Maine (where I was born and raised) with my wife, Doris, and our two children, the younger of whom was born at Ft. Bragg, North Carolina, shortly before my discharge. The only possibility of graduate school for a person with no money and a family to support was the University of Maine, which had no graduate program in philosophy. The closest thing it offered was a masters program in experimental psychology, so I enrolled in that, and spent a couple of years pumping gas in the evenings, climbing trees for an arborist company weekends and summers, and caring for a rat lab while learning how to give IQ tests at the university.

Shortly before graduation in 1959, when I was pondering what to do next and trying to figure a way to go on for a PhD, which the U of M did not offer at the time, Don Devoe, a fellow Mainiac and long-time member of HFES (whom I had not met), knocked on our apartment door one evening and offered me a job at the Decision Sciences Laboratory (then known as the Operational Applications Laboratory) within the Electronic Systems Division of the U.S. Air Force at Hanscom Field, in Bedford, MA. I knew nothing about the lab—had never heard of it—but there were two things about the offer that made it irresistible to me: (1) the astounding salary of $6,000/yr (regal compared to what one made in those days pumping gas and climbing trees), and (2) the prospect of going on for a PhD at the Air Force's expense. Don explained to me that the lab would pay my tuition if I could arrange a schedule that would permit me to do my work at the lab while taking courses at a university on a stretched-out schedule. I took the job and, in due course, enrolled in a PhD program in experimental psychology at Tufts University, which had a strong human factors program (and a Human Engineering Institute), and was willing to let me keep an unorthodox schedule that permitted me to take classes while still working full time at Hanscom. I am very grateful to Dorothea Crook, then department chair, Philip Sampson, my advisor, and James Duva, the Decision Sciences Lab director, for making this possible.

I stayed at the Decision Sciences Lab from 1959 to 1965. Shortly after arriving there, the Digital Equipment Corporation brought to market its PDP-1 computer (a forerunner of the PDP-8 that later was to populate so many psychological labs around the country). Thanks largely to the foresight of one of our group—Charles Brown—we acquired one of these remarkable machines; I believe it was serial #4, and a few of us learned to program it and to use it to control

experiments. This was a wonderful learning experience for me and it proved to be invaluable in the coming years. Another aspect of DSL that stands out in my memory is that Irwin Pollack was there. I never worked directly with him on a project, but his work ethic and extraordinary productivity made a lasting impression on me.

I received my PhD from Tufts in 1965 at just about the time the Air Force started reorganizing its laboratories, and I was faced with the decision of relocating if I wanted to remain in an Air Force lab or finding other employment if I wished to stay in the area. For several reasons—among them the fact that we had recently bought our first (and current) house—my wife and I strongly wished to stay put. While considering options, I received, to my delight, an invitation—engineered by John Senders—to join Bolt Beranek and Newman Inc (BBN), later BBN Technologies. A major attraction to me was the company's reputation as a stellar R&D organization; another was that BBN had a PDP-1 (serial #2, I think) and people (J.C.R. Licklider, Ed Fredkin, many others) who knew how to use it. The transition was made painless by the good graces of Jerry Elkind and John Swets, co-directors of the division of BBN in which I was to work.

One of my projects during my first few years at BBN was the teaching of a computer course at Tufts in which students were given remote access, via terminals connected by telephone lines to a time-shared system at BBN. (BBN was a pioneer in time sharing.) Eventually I had to give up teaching because other commitments at BBN left insufficient time for it. After becoming a division director in 1969, my work became a mix of management and research. I enjoyed both and learned much from colleagues working on a great diversity of problems in a variety of areas—artificial intelligence, educational technology, psychoacoustics, distributed information systems, speech signal processing, to name a few. Innovation was par for the course; a steady stream of new projects, new challenges, new opportunities. A sense of the range of projects that BBN undertook that related most directly to computer technology is given in two special issues of *IEEE Annals of the History of Computing*—Vol. 27(2), 2005 and Vol 28(1), 2006. An article by John Swets in the first of these issues describes how behavioral and computer sciences related at BBN. A general account of psychological projects at BBN is available on request from r.nickerson@tufts.edu.

I retired from BBN, after 25 eventful and gratifying years there, in 1991. My intention was to try to do some writing for a couple of years (several projects had been gestating for a while), and then perhaps to seek an opportunity to teach. Shortly after retiring, I was asked by the APA to be the founding editor of *JEP: Applied*, which, with some trepidation, I agreed to do. To facilitate this, Tufts gave me an appointment and provided office space for an assistant. While editing the journal, I became involved in research at Tufts, and after my term was completed I was given the opportunity to continue the affiliation as a research professor, which I gladly took.

My own research has focused more on conventional experimental psychological topics—thinking, memory, perception—than on human factors, but there were many opportunities, while at BBN, to work on applied projects with human factors issues. "Milestones" that I remember with satisfaction are projects (always with BBN colleagues and often with colleagues from MIT and Harvard) on a broad assortment of problems including the development of speech training aids for deaf children, the teaching of thinking to middle-school students in Venezuela, and the design and testing of vehicle rear-lighting systems. Support for work on which I served as PI came from the Army Research Institute, the Air Force Office of Scientific Research, the U.S. Department of HEW (Bureau of Education for the Handicapped), the U.S. Navy (Training Devices Center), DARPA, the National Institute of Education, and the Government of Venezuela.

Employment History (List top 5 positions):

Tufts University, Affiliate to Research Professor, 1993-
Bolt Beranek & Newman Inc (BBN Technologies), 1966-91, Sr Scientist to Sr VP, retired 1991
Decision Sciences Laboratory, Electronic Systems Division, U.S. Air Force, 1959-66; Research Psychologist to Chief, Analytic Techniques Group

What were your significant contributions to the field?
My involvement in human factors activities has been in conducting and/or managing research projects, serving on committees, panels, advisory boards, etc. and editing and publishing; whether significant or not, I will leave for others to judge. Research activities are mentioned above. Involvement in committees, etc. has included chairing the National Research Council's Panel on User-Information System Interaction (1983), the International Association for the Study of Attention and Performance (1984-1986) and the National Research Council's Committee on Human Factors (now Board on Human-Systems Integration) (1991-1994). Editing has included being founding editor of *Journal of Experimental Psychology: Applied* (1994-2001), founding and series editor of *Reviews of Human Factors and Ergonomics* (2005-2010), guest editor of special issues of *Human Factors, Educational Researcher,* and *IEEE Annals of the History of Computing*, and editor of several books, the most relevant to human factors being *Emerging needs and opportunities for human factors research* (National Academy Press, 1995). Authored books include *Using computers: Human factors in information systems* (MIT Press, 1986), *Looking ahead: Human factors challenges in a changing world* (Erlbaum, 1992), *Psychology and environmental change* (Psychology Press, 2003) and *Mathematical reasoning: Patterns, problems, conjectures and proofs* (Psychology Press, 2010).

Did you receive any notable awards or recognition during your career?
Fellow:

   American Association for the Advancement of Science

   American Psychological Association (Divisions 1, 3, 21)

   Association for Psychological Science

   Human Factors and Ergonomics Society

   Society of Experimental Psychologists

Franklin V. Taylor Award, APA Div of Applied and Experimental Psychology, 1991

Raymond S. Nickerson Best Paper Award for the *Journal of Experimental Psychology: Applied* (established by APA, Div 21, 2009)

Outstanding Career Achievement Award, Tufts University, Graduate School of Arts and Sciences, 2011

ARC Massachusetts (Formerly Massachusetts Association for Retarded Citizens)

   Special Contribution Award, 1982

   Outstanding Service Award, 1986

   50th Anniversary Honoree (one of 14), 2005

Phi Kappa Phi

Sigma Xi

Resolution of appreciation for "outstanding achievements and contributions" from BBN Board of Directors, 1991

Which articles in the journal *Human Factors* would you say were the most influential to you and your research or practice?
Articles have been less influential for me than friends and colleagues in the HFE field whose work I have admired for many years. Some who come immediately to mind are (in alphabetical order) Deborah Boehm-Davis, Francis Durso, Jerome Elkind, Carl Feehrer, Douglas Harris, William Howell, Thomas Landauer, Neville Moray, Richard Pew, Wendy Rogers, John Senders, Thomas Sheridan, Christopher Wickens, and Robert Williges. Good company indeed!

Please provide any links to your online articles, essays, blogs, Wikipedia pages, etc., that pertain to your research, publications or practice.
List of recent publications at http://ase.tufts.edu/psychology/peopleNickerson.htm.

What advice would you give someone considering HF/E as a profession?
Get information about HFE work from books (there are many that describe it, some written expressly for students still considering possibilities), from communicating (talking or corresponding) with people in the field, and, if possible, by arranging to work (as an unpaid volunteer if necessary) as a student apprentice for a short time in a human factors group. Develop your communication skills (speaking, writing and listening); HFE people more often than not work as members of teams and being able to interact smoothly is extremely important. Commit to being a life-long learner. Hone your sense of humor.