

Preface: The Importance of Technological Solutions to the Asymmetric Pattern of Global Aging

Aging of the human population is not uniform across the globe. In the so-called developing countries, where catastrophes and epidemics have taken a tremendous toll on the older generations, the age distribution strongly favors those of younger years. In so-called developed countries the pattern is largely inverted, such that the predominant growth is of older individuals and present young generations are fewer in comparison. This global asymmetry promises to lead to a catastrophic imbalance in which some countries will have insufficient numbers of young individuals to support the upper age group. In contrast, the developing nations will lack virtually a generation of experienced persons, who have traditionally been the repository of active knowledge.

The wild card in this whole picture is technology. Technology permits mass migration, in which individuals are able to travel globally and to settle (where permitted) in societies desperate for the infusion of younger members. Technology also facilitates productivity on behalf of older individuals, so that chronological age need not necessarily covary with retirement and the ascendancy of resource consumption over resource production. Indeed, many societies have to consider this proposition immediately because societal safety nets (such as Social Security), even in the most optimistic prognostications, will not be able to support the generations of older resident individuals.

Combined with such econometric issues are the ergonometic issues that promise the greatest opportunity for resolution. It is evident that individual longevity is increasing. Not merely the statistical artifact of reduced child mortality, the average age at death continues to increase. Phrases such as "60 is the new 40" are representative of the social recognition of this trend. However, when one embraces the idea of longer existence, the intrinsically attached corollary is years of healthy, productive life. Few

people would embrace more years of life if such years are to be spent in a vegetative state or in a condition of continuous, chronic pain. Thus aging per se is no great boon; it is further years of happy, healthy, productive life that are envisioned. This vision is set against the known degradation of physical and cognitive capacities across time. Again, such degradation need not necessarily covary with chronologic age, and some tendencies are reversible with training or activity, the control of diet, and medication. However, the primary avenue is the use of technology to augment performance capacities, contingent upon the capabilities of the individuals themselves or a focus on individualism.

The foregoing serves to reinforce what is only now coming to be recognized sufficiently at a societal level. The differential pattern of aging poses a problem that demands solution. Failure in this effort will destroy social infrastructure in developed nations and may create anarchy in the developing world. From these premises there arises an urgent need for understanding how to design and have technology function efficiently for older individuals.

Each paper in this special section of *Human Factors* reflects facets of the overarching need. These works include the observations of Hancock and her colleagues on the issues of product warning, in which the age-related change in cognitive function exerts important effects. Out on the road, Caird and his colleagues explore the problems encountered by older drivers. Such issues are assuming an ever greater importance as questions of mobility for an aging population come ever more to the fore. Proctor and his co-investigators have evaluated existing literature concerning two fundamental processing properties and how they change with age. As these authors indicate, understanding such basic processes is crucial to issues related to design for an aging population. Rogers, Fisk, and their colleagues have pioneered important work on

the innovative attempts to understand the house of the future for an aging society. Their present work adds to their already significant body of work through examination of differing input devices and the context of their usage. Finally, LaBerge and Scialfa report on age-related changes in memory and speed of processing related to Web navigation performance.

The differential aging problems of the world's population cannot be solved by some continual, massive global emigration policy. The established nation state structure will largely obviate any such distributional solutions. What is required are ways to keep aging adults happy, healthy, and productive in the developed world and ways

to transfer knowledge and wisdom to developing nations that have lost significant numbers of their older members. The solution lies in technology, but the barriers to successful implementation are all "human factors." The present work is offered as one small contribution to the problem, which – although now "smaller than a man's hand" – will threaten continued global well-being long into the present century.

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