Ageism and Technology

By Stephen J. Cutler

It is useful to think of ageism and technology as having a reciprocal influence on one another. Ageism has important implications for how new technologies are developed and marketed, just as ageism can be a potent factor affecting the adoption of new technologies by older people. At the same time, technology may be considered as having the potential to affect ageism—both by fostering the perpetuation of ageism and by acting as a force contributing to the weakening of ageist views.

A reciprocal influence.

Impact of Ageism on Technology

The older population has been portrayed in a variety of unflattering ways as a result of ageism. Other articles in this issue deal with these portraits, and with how they may be changing, in more detail. However, some stereotypical views of aging and of the older population bear repeating here because of their implications for the development, design, and adoption of technology.

Ageist views have typically held that older people are poor, frail, and resistant to change. Yet we know from repeated studies that estimates by the general public of the extent to which low income or poor health are problems for older people far exceed the extent to which older people themselves see these issues as personal problems. For example, data from the American Perceptions of Aging in the 21st Century survey (Cutler and Whitelaw, 2000) show that only 4 percent of people 18–64 years of age thought that poor health was *not* a problem for most people over 65. Yet, 56 percent of people 65 and older reported that poor health was not a problem for them personally. Data from the study yield a similar picture about income: Some 53 percent of younger people thought that not having enough money to live on was a very serious problem for most older people, but only 15 percent of the older population thought it was a very serious problem for them personally. Although a more recent brand of ageism paints a picture of older people as being relatively well-off and hoarding entitlement resources they do not really need—as being "greedy geezers"—frailty and poverty continue to be the images of the elderly that the general public holds far in excess of the prevalence with which these problems are reported as actually being experienced by older people.

Another facet of the ageist portrait of the older population has to do with the willingness and capability of older people to learn and with their openness to change. A clear depiction is found in the writings of Sigmund Freud, who once argued that psychotherapy would be of little or no benefit to older people:

The age of patients has this importance in determining their fitness for psychoanalytic treatment; that, on the one hand, more or less above the fifties, the elasticity of mental processes, on which the treatment depends, is as a rule lacking—*older people are no longer educable*—and on the other hand, the mass of material to be dealt with would prolong the duration of treatment indefinitely. (cited in Horton, 1982, p.1; italics added)

Other data from the 2000 American Perceptions of Aging in the 21st Century survey show that only 9 percent of people 18–64 years of age thought that most older people were very open-minded and adaptable, while 55 percent of older people thought of themselves in this way. The Swedish mystery writer Henning Mankell (2003, p.398) sums up this stereotype when his protagonist, Inspector Kurt Wallender, laments his inability to fathom the use of computers in law enforcement: " . . . now there were whole domains of knowledge he knew nothing about. He was forced to accept the fact that he had simply become old. An old dog who could no longer be taught new tricks."

That these sorts of images are at such considerable variance from the ways older people view themselves has important implications for the development and adoption of technology. A recent report from the National Research Council noted that technology is typically developed by younger people for the use of younger people and marketed at younger target groups (Pew and Van Hemel, 2004). To appreciate the validity of this observation, think about how seldom older people are evident in ads for home computers. Or, how often do we see older people appear in ads for cell phones? Despite the sizeable amount of discretionary income available to some segments of the older population, especially to the young-old, stereotypical images of aging work against targeting older people as a share of the market for new technologies.

In addition to their effect on the marketing of new technologies, ageist stereotypes can create obstacles that stand in the way of older people adopting new technologies when they are available. As Pew and Van Hemel (2004) note, "expectations can present major barriers to the acceptance of new technologies" (p.13). These expectations can be both external and internal. For instance, the expectations of others may prove to be powerful inhibitors of an interest in using new technologies. In a vignette study comparing perceptions of how likely a 25-year-old versus a 70-year-old would be to enroll in a computer course and complete it successfully, Ryan, Szechtman, and Bodkin (1992) found expectations to be lower for the older adults. The researchers conclude that "to the extent that behaviors of young and old are influenced by this societal expectation, the opportunities and inclination of older adults to access computer technology would seem to be limited" (p.99).

Internal expectations and stereotypes can play a role as well. Studies of hearing-aid use routinely report that a stigma associated with old age is among the major reasons that people with hearing problems are reluctant to adopt these assistive devices (e.g., Erler and Garstecki, 2002). A related finding comes from the work of Gitlin, Luborsky, and Schemm (1998) who, in qualitative analyses, found that the potential use of assistive devices evoked concerns about social identity, stigma, and self-image. Thus, stereotyping by others and self-stereotyping—the expectations that others hold and the expectations that individuals themselves hold—may impede an older person's adoption of new technologies.

In what can then amount to a self-fulfilling prophecy, the older person may indeed have more difficulty using technology designed with a younger market in mind. Characteristic aspects of the aging process at the physical and psychological levels are rarely taken into consideration in the design and development phases, thus rendering technological products less accessible to the older population. This in turn perpetuates and reinforces images of older people as being incapable of and uninterested in adopting new technological products. In the vast panoply of human-factors research that goes into design and marketing of modern technology, older users seldom make an appearance.

For example, although there is considerable variability, motor functioning in older adults may be slower because of changes in fine motor coordination or conditions such as arthritis that impair motion. As a consequence, the use of a computer mouse or a trackball has been shown

to be more difficult for older adults, especially with smaller on-screen targets (Czaja and Lee, 2002). Auditory changes with aging, as in the frequency with which sounds can be discriminated, and changes in vision, such as decreasing transparency of the optical lens, have clear implications for product design (Schieber, 2003). Thus, Charness (1998) showed that older people respond less quickly to high-frequency auditory signals from a computer and that change in the level of luminance has a greater impact on the task performance of older workers than of younger workers. Also, older people typically perform less well than younger people on tasks involving short-term and working memory and tend to be slower in completing other cognitive tasks (Brown and Park, 2003).

Consider the implications of these differences for ease of using the automated telephone voice-menu systems that have become so prevalent. The longer the message and, in particular, the greater the number of options to be retained in one's memory, the more difficult such systems are for older users (Sharit et al., 2003).

Ageism may limit the access elders have to the benefits of technological advances in yet another way: Older people are used disproportionately less as subjects of biomedical research (Hendricks and Cutler, 2005). Ethical perspectives and legal regulations govern participation of human subjects in biomedical, social, or behavioral research. According to one widely accepted set of guidelines (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978), participation in research should be based on principles of respect, beneficence, and justice. That is, (1) the involvement of human subjects in research requires autonomous decision-making and informed consent, (2) the benefits of the research must outweigh possible harms, and (3) the ways research subjects are solicited and selected must be fair and equitable.

It is particularly in regard to the last criterion—justice and equity in the selection of research subjects—where ageism enters. It is well established that heart disease and cancer are the two leading causes of death and among the leading causes of hospitalization of the elderly (Anderson, 2002, Table 1; Hall and Owings, 2002, Table 2). Because these conditions are so prevalent among older people, it might be expected that studies intended to develop accurate diagnostic procedures and effective treatments should include appropriate representation of older people as research subjects. Yet, the evidence indicates otherwise. One investigation found people 75 and older represented 37 percent of patients with heart attacks in the United States but just 9 percent of patients enrolled in randomized controlled trials dealing with acute coronary syndromes (Lee et al., 2001). Another study noted people 65 and older accounted for 63 percent of patients with cancer in the U.S. but only 25 percent of the subjects enrolled in a series of 164 cancer treatment trials (Hutchins et al., 1999). Finally, a British study of upper age restrictions for participating in biomedical research concluded that over half of the limitations were unjustified and unnecessary (Bayer and Tadd, 2000).

This disproportionately low representation of older people is in part the result of negative stereotypes about competence, reliability, and commitment to and compliance with the requirements for research participation (Bayer and Tadd, 2000; Lee et al., 2001). Undoubtedly, under-representation of older people in research on health conditions that are increasingly prevalent with age makes it problematic to generalize from results of unrepresentative studies to the very people most affected. As Bayer and Tadd (2000, p.993) note: "Abolishing ageist practices and attitudes in research, as well as in clinical practice, is important if elderly people are to gain maximum benefit from advances in health care."

Impact of Technology on Ageism

It should be clear from the foregoing that ageism has important implications for the design and development of technology for older people and for their adoption of it. What remains to be considered is the impact of technology on ageism. Will technology contribute to the perpetuation of ageism, or will technology prove to be a force reducing or eradicating ageism? Several considerations suggest that technology may operate in both ways.

To the extent that the needs and characteristics of older people are neglected in the design, development, and marketing of technologies, elders will continue to be disproportionately low adopters and users. There is ample evidence that current cohorts of older people are less likely to use personal computers, the Internet, cell phones, ATM machines, and other related technologies (Cutler, forthcoming).

A variety of factors contributes to these technological "divides." Product design and marketing are certainly among the factors leading to differences in access among age groups, but so are costs. Technology can be expensive and beyond the financial reach of many elders. To take one example, older people are far less likely to have personal computers available to them in their households than are middle aged and younger people (Cutler, Hendricks, and Guyer, 2003). But having a personal computer is associated with income, and older people with fixed and limited economic resources may be unable to acquire a computer despite the many benefits associated with having one. In another domain, the potential benefits of "smart" houses are impressive, but more fundamental for many elders are basic housing issues of availability, affordability, and adequacy (Cutler and Hendricks, 2001). Navigational systems, already available in high-end automobiles, may make it easier to reach destinations safely. These systems may benefit some segments of the older population, but for many others the availability, accessibility, and cost of any form of transportation is a far more immediate issue.

Thus, for people living with limited economic resources, the fruits of technological change may be inaccessible, thereby creating or perpetuating a technological divide. However, such differentials in access, adoption, and use may continue to be perceived as reflecting a lack of interest in or an inability to use new technologies rather than being attributed to a lack of economic resources. If the cost of new technologies is prohibitive, technology may play an important role in the perpetuation of ageism via this route.

A different and more positive view of the role of technology would point to its potential for reducing ageism. One mechanism by which this might occur is if technology serves to level the playing field. If technology can eradicate or blur differences that are the basis of ageist views, stereotypical images can be challenged.

This phenomenon might occur in a variety of ways. For one, assistive devices reduce disability and promote independence, and their use may be among the factors contributing to declining rates of chronic disability among the older population. Several investigators note that the use of assistive devices has increased at the same time that the prevalence of chronic disability has declined (e.g., Russell et al., 1997). By fostering effective functioning, images of elders as frail, housebound, and bedridden are challenged and potentially replaced by far more favorable views.

Or take the workplace as another example. Older workers are often thought to be at a disadvantage because they lack experience with newer forms of technology. They are assumed to have greater difficulty learning tasks associated with new technology or to be unable to learn them at all. Retraining programs are considered to be less effective and more expensive for older as compared to younger people. Yet, numerous studies have demonstrated that older workers are both willing to learn how to use new technology and capable of acquiring the needed skills (Czaja, 2001). It may only be a matter of the learning curve being slower, and training programs needing to be designed to take account of cognitive, sensory, and physical changes accompanying aging. When such steps are taken, research shows that older workers are able to function effectively in workplaces with changing technological environments (Czaja and Moen, 2004). Moreover, retaining older workers despite retraining costs is ultimately cost-effective because of their lower rates of absenteeism and turnover (Czaja, 2001).

SIGNS OF CHANGE

However, this culture that fails to take characteristics and needs of the older population into account may be changing. There are signs of growing interest in the development and application of technologies specifically for older people and in developing products that more nearly approximate the goal of universal design. No doubt, some of this interest is driven by a growing awareness of the commercial and mar-

ket implications of social and demographic trends (Brink, 1997). Projections of a doubling of the size of the older (age 65-plus) population between 2000 and 2030 and of an even greater rate of increase in the numbers of the oldest-old (age 85-plus) (U.S. Census Bureau, 2003) have not escaped the attention of the business community. The purchasing power of the older population makes it a growing and attractive market. The "graying" of the labor force (Czaja and Moen, 2004) has apparently been an incentive for industry to ask how technology might be better suited to the needs of older workers (Mosner, Spiezle, and Emerman, 2003).

The Microsoft Corporation (2004), for example, devotes a section of its website to the implications of how "accessible technology can help aging workers retain high productivity." And, the prevalence of functional limitations and related health problems that increase with age points to continued growth in the market for assistive and other enabling technologies. The Intel Corporation (2004), for example, has established the Proactive Health Research Program, an initiative focusing on how technology can support aging in place among those experiencing physical and cognitive declines, meet the needs of people with chronic health conditions, and promote wellness through primary prevention of illness.

Conclusion

As this article makes clear, the relationship between ageism and technology is complex. There does seem to be a reasonably strong basis for concluding that ageism has had an impact on technology and on how it is developed and marketed, with the principal outcome being to leave older people at a disadvantage. However, population aging may broaden the market horizons of manufacturers and cause them to take a fresh look at how technology might be configured to serve the needs of both older people and their younger counterparts. There are indications that these changes may be occurring, thereby potentially reducing the negative impact of ageism on technology. How technology can influence ageism, and the conditions under which it does so, are topics that warrant further study. If limited economic resources cause substantial segments of the older population to be shut out from access to the benefits of technology, the stage is set for the persistence of stereotypical views of older people. If, on the other hand, technology can be designed and employed so that differences in use related to age are minimized, the result may be to reduce the age-based technological divide and to diminish ageism.

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