CHAPTER THIRTY

AGE-SPECIFIC TECHNOLOGY: A DEMOGRAPHIC CHALLENGE FOR DESIGN

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1. Introduction

Changes in demography have recently generated considerable interest in designing products for the over-60s, by implication, ‘the older generation’. However, the ageing process is insidious, with different rates for different individuals. The onset and speed of the ageing process are also fairly individual, depending upon the decade of birth, and on health, nutrition, exercise, work and social activities throughout life. It is therefore more useful to think in terms of functional ability, particularly at the extremes of the population, and design accordingly. As a result, all those who are younger and stronger, with better eyesight, hearing or manipulative skill should also be able to use the product.

Designing or marketing products purely for the population aged 60 years and older does not necessarily make economic sense, since this group currently accounts for less than 50 per cent of the adult population. A ‘design for all’ philosophy could make a product attractive to and usable by perhaps 80 per cent of the adult population, thus achieving a greater return for research and development.

To follow this principle and achieve functional, efficient, safe and attractive design which enhances our abilities or compensates for our limitations, it is necessary to consider what is known about how our senses and physical capabilities change with age, and to revise the guidance available to designers. The user of a product needs to be able to see it, understand it, possibly hear it and probably manipulate it in some way consequently the most relevant physical capabilities to consider are eyesight, hearing and hand function. Mental abilities are related to the information obtained from the interaction of senses and feedback, and a discussion of the mental changes associated with ageing is included.
2. PHYSICAL ASPECTS OF AGEING

2.1. Vision

There is a deterioration of vision due to changes in the normal ageing eye which may be exacerbated if the individual has a degenerative eye disease, the likelihood of which increases with age. The vision of older product users may not be an insurmountable problem, however, given the correct provision and use of vision aids and access to corrective surgery, such as cataract removal.

Visual capabilities can be assessed in terms of: acuity, accommodation, contrast sensitivity, glare sensitivity, dark adaptation, colour vision and stereopsis.

2.1.1. Visual acuity

Acuity refers to the ability of the eye to see the shapes of objects, that is, the ability to see fine detail sharply. The ability of the pupil to change size in response to ambient light reaches its maximum in the early teens and progressively diminishes thereafter, with the effect of reducing the amount of light transmitted to the retina, particularly after the age of 60. The lens also tends to discolour with age: less light enters the eye and an increase in illumination is necessary for older people to overcome these effects. It has been estimated that the average 60-year-old eye requires three times as much light as a 20-year-old eye to see the same object (Weale 1963).

2.1.2. Accommodation

Accommodation is the ability of the eye to focus on near and far objects. The near point of accommodation recedes from approximately age 8 to age 50, when it begins to level off after a 55 per cent decrease. (Pitts 1982) The loss of elasticity with age also causes a reduction in the speed of accommodation. As a consequence, older people have difficulty reading without glasses. This loss of ability to focus the eyes on near objects, which occurs with age, is called presbyopia.

2.1.3. Contrast sensitivity

Contrast sensitivity is the ability to distinguish between light and dark; this affects the ability to see the outline of an object clearly. An increase in illumination can improve performance until a point is reached at which glare begins to decrease performance. Between ages 20 and 80