

Persuasive gerontechnology

Y.A.W. de Kort PhD
W.A. IJsselsteijn PhD
C.J.H. Midden PhD

Department of Technology Management

J.H. Eggen PhD
E.A.W.H. van den Hoven PhD

Department of Industrial Design

Technische Universiteit Eindhoven, Eindhoven, the Netherlands

E: Y.A.W.d.Kort@tm.tue.nl

Y.A.W. de Kort, W.A. IJsselsteijn, C.J.H. Midden, J.H. Eggen, E.A.W.H. van den Hoven, Persuasive gerontechnology, Gerontechnology 2005; 4(3):123-127. Gerontechnology is a domain that originated a few decades ago and has been developing steadily ever since. Its research focuses on a broad set of technologies to serve the ageing society. The present paper aims to connect this domain to a new but promising technology domain that holds great potential for the older population: persuasive technology.

Keywords: persuasive technology, elderly, connectedness, rehabilitation

Trends in the world's demographics have stimulated a host of research and development efforts aimed both at adding more years to life and adding life to years. Old age is valued and striven for by many, although the challenges and problems related to ageing are also generally acknowledged¹. Traditionally, technology's answer to these problems has mainly been sought in medical and assistive technology, and ergonomics. Medical technology supports diagnosis and treatment, while assistive technology aims to provide monitoring in the service of safety and security, as well as support or compensation of activities that have become difficult or impossible to perform independently for the older individual. From its start in the early nineties, Gerontechnology has aimed at goals beyond these, towards prevention and enhancement². Recently, a new class of technologies emerged which, as yet, has only received surprisingly scarce attention in gerontechnology. This class is known as persuasive technology.

PERSUASIVE TECHNOLOGY IN THE SERVICE OF OLDER INDIVIDUALS

Persuasive technology involves the use of technology for the deliberate change of a user's attitude or behaviour, for example, to help or stimulate a person to stop smoking, exercise more regularly, or learn more efficiently. Persuasive technology was identified as a separate research field almost one decade ago, as is evidenced by B.J. Fogg's first discussion of the domain³. Fogg coined the term 'captology', as the study of computers as persuasive technologies. The scope of technologies that hold persuasive potential is broader than ICT alone, and could include persuasive (or seductive) product design or architectural design, yet the interactive nature of computers uniquely enables user-sensitive and user-adaptive responding. These characteristics allow the persuasive message to be tailored to the specific user in question, thereby heightening its likely impact⁴. Surprisingly, a survey by the Persuasive Technology Laboratory in Stanford illustrated that most persuas-

ive technologies used up to then were aimed at teen and preteen children⁵. However, persuasive technology has potential to be of great value for the ageing population as well.

Many of the challenges and problems of old age could be overcome by enduring life style or behaviour changes, such as dietary changes, exercise behaviour, or compliance to prescribed medication regimes. Other problems may be prevented through a continuation of already existing 'healthy behaviours', such as maintenance of an active social network and engaging in leisure activities. However, keeping up such healthy behaviours may become problematic in old age due to physical limitations, cognitive changes, as well as changing social roles. Behavioural changes are sometimes even harder to realise, due to a complex variety of reasons, for instance changing cost-benefit perceptions with increasing age⁶, the prevalence of depression in old age⁷, or difficulties in breaking old habits.

In this context, persuasive technology can play a positive role by convincing, stimulating, or motivating users to engage in healthy behaviours. Such technology needs to monitor (aspects of) relevant behaviours and may intervene in a variety of ways, for instance, by providing timely feedback and advice, by making the target behaviour easier to perform, or by rewarding desirable actions and discouraging potentially harmful ones. Next, we will briefly discuss two areas where persuasive technology can be applied that have clear relevance to gerontechnology, as an illustration of the complexity but also the great potential of this area for an ageing population.

TECHNOLOGIES FOR SOCIAL INTEGRATION AND CONNECTEDNESS

A significant amount of research has ac-

cumulated over recent years that reveals the importance of social relationships for physical and psychological health^{8,9}. There is substantial evidence that supports the contention that perceived availability of social support can act as a buffer against psychological distress, depression, and anxiety. Similarly, a high level of social integration has also been shown to be associated with lower mortality rates¹⁰.

Today's communication technologies have significant potential in enhancing social connectedness, yet fail to reach the majority of an ageing population. Whereas traditional communication media, such as letters and the telephone, managed to create and preserve social bonds and interpersonal relations across borders and oceans, today's electronic communication media - TV, computers and the internet - seem to have only reduced the motivation for, and the quality of social interaction¹¹.

To address this issue, novel communication applications are currently being explored in Human Computer Interaction (HCI) which derive part of their beneficial effects from persuasive properties of the technology. For example, awareness technologies supporting intimate social networks are creating new opportunities for communication, and simultaneously stimulate more frequent contact through prompting¹²⁻¹⁴. In therapeutic contexts (e.g., dementia treatment), social robots are being developed which stimulate activity and social interactions between patients, or between patients and caregivers¹⁵. Thirdly, a trend is envisaged in which the developing field of social gaming¹⁶ might also be geared at supporting social interaction among the elderly, or stimulating intergenerational contact, aimed towards social integration, continued learning, and mutual understanding and respect.

TECHNOLOGIES FOR PHYSICAL HEALTH AND REHABILITATION

A second exemplary domain of persuasive technologies relevant for an ageing population is the use of virtual environments (VEs) for both motor and cognitive rehabilitation¹⁷⁻¹⁹. VE technology offers excellent functionality for rehabilitation such as the provision of various trackers and sensors, stimulus control and support of repetitious behaviour. However, the same technology allows additional functionalities that go beyond assistive characteristics and offer persuasive affordances. For instance, VEs provide a safe ground for psychotherapeutic interventions, which lowers barriers to engage in therapy, and is hypothesized to trigger empowerment via processes of perceived control and competence, and goal internalisation²⁰⁻²¹. In addition, VEs provide excellent motivational potential through possibilities of immediate performance feedback, coaching via virtual social agents and engaging or ecologically valid - and thus meaningful - virtual exercise environments^{17,22,23}. Persuasive technologies like these could help suppress or overcome the frequent incidence of non-compliance to new training or medicine regimes, aggravated by problems such as depressive symptoms, a general lack of energy or simply the force of habit.

CONCLUSION

Interactive technologies that employ psychological principles of motivation and influence can become powerful tools in changing people's behaviours and attitudes. Of course, the technology examples mentioned above by no means cover the full spectrum of possibilities. For instance, intelligent products, systems and environments, collectively known as Ambient Intelligence²⁴, have the potential of becoming an important enabler to positively influence the quality of life of elderly people. Ambient Intel-

ligence applications employ networks of sensing devices and embedded computational capacity which provide powerful tools for user profiling and subsequent persuasive feedback. Earlier issues of this journal have also contained interesting examples of technologies with persuasive aspects²⁵⁻²⁸ as well as research informing these developments²⁹.

A common misunderstanding regarding persuasive technologies is that they are inherently patronising or even coercive. This misunderstanding is often based on the premise that the persuasive nature of a technology resides in the technology itself. Instead, persuasive intent is located in the context of creation, distribution, and adoption of the technology³⁰. Persuasive technology may be created and distributed by others, yet willingly adopted by a person to change his or her own attitudes or behaviour (i.e., autogenous in intent). Such technologies do not take away independence or autonomy, but instead help their users to reach goals they themselves seek but cannot easily attain. This is comparable to for instance hiring a coach for motivation, or seeking the help of a friend in changing a habit that is hard to break. Nevertheless, in the development and application of persuasive technologies, ethics and issues of user acceptance have to be carefully considered, as is true for all technologies that have the potential to impact on people's lives.

As technologies are becoming more user-sensitive, opportunities arise for tailoring system responses to specific user needs, habits, and general ways of life in a timely and spatially and contextually fine-tuned way. Adding persuasive properties to assistive and medical applications can significantly enhance their motivational affordances, improving gerontechnology's power in important directions of prevention, compensa-

tion and enhancement², opening up new and promising paths to the ambitions of aging persons such as good health, independent living, and full social participation³¹.

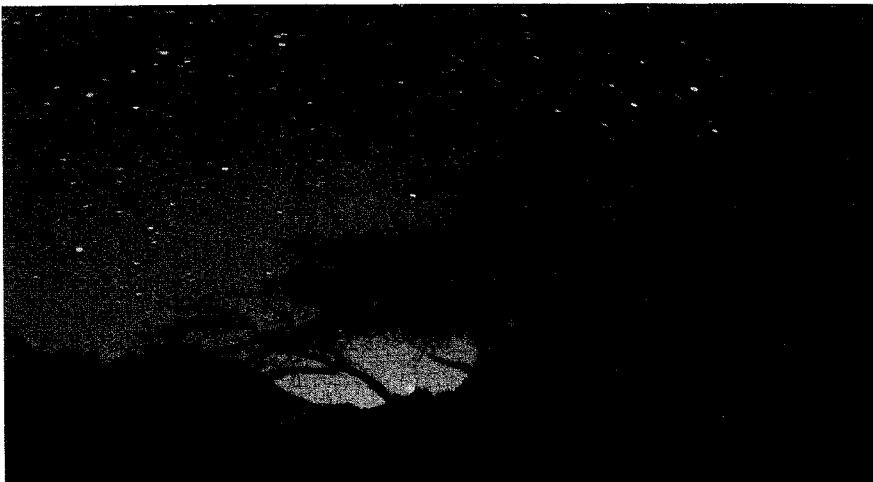
AUTHORS' NOTE

For the latest information on this topic we refer you to the first international conference on Persuasive Technology for human well-being, 18-19 May 2006 in Eindhoven, The Netherlands, www.persuasivetechology.org

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With this poignant view of the setting star of the Elders, Canopus, the editors wish you health, happiness, and prosperity during 2006 and beyond

(Picture taken in the Sinai Desert on November 17, 1999, at 03:53 H local time, by David-John Barbes, E: davidjohnbarnes@ntlworld.com) (see page 181)