

**PAPER SESSION 'COMMUNICATION (2)'; CHAIR: HERMAN BOUMA (THE NETHERLANDS)**

*Predicting the use of technology: Findings from the center for research and education on aging and technology enhancement (CREATE)*

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The Center for Research and Education on Aging and Technology Enhancement (CREATE) emphasizes the importance of having a good fit between the demands of technology and the capabilities of the older user. Functional independence in old age relies increasingly on the successful adoption of technology. We report findings on the use of technology among community-dwelling adults. The sample of 633 individuals ranged in age from 18-91 years. All participants completed a battery that included demographic characteristics, self-rated health, experience with technology, attitudes towards computers, and cognitive abilities. Findings indicated that the older adults

were less likely than younger adults to use computers and the World Wide Web and that demographic factors, gender, computer anxiety, and cognitive abilities were important predictors of the use of these technologies. However, the relationship between cognitive abilities and computer use varied with age. The results suggest that computer-training programs should focus on techniques to reduce anxiety about using computers as well as providing computer skills training. They also indicate that systems that are cognitively demanding are less likely to be used by people of all ages. We also outline our planned direction for the CREATE II project.

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*How can we make IT devices easy for elderly people?: Usability testing of electronic program guide system*

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Although elder people are said to have difficulties in using unfamiliar IT appliances, devices in daily life, e.g. TV sets, are getting more difficult to use because their design concepts are now based on information technology. Investigating how to make these old-and-new IT devices easy even for elder people, a usability test of Electronic Program Guide on digital TV was executed, comparing elder people with young, and also between groups of different PC experiences (N=30, for total). Behavioural and verbal protocol data were analyzed, in order to describe problem-solving processes. One of most interesting results was phenomena, called 'Color slip', which is a direct but

wrong association between colors of items on the screen and the color buttons on remote-controllers. The other result was the navigation on layered menu structures. The first layer, which indicated behaviour repository, was difficult to select for all old participants. There were differences on which layer the selection behaviour available between PC experience groups. Results were discussed with the three-layered model of cognitive aging and usability (Harada & Akatsu, 2003), and the relation of the bottom layer (changes of cognitive functioning) and the second (shortage of knowledge and mental models) will be discussed.

*PDA based communication aid for cerebral palsy patient*

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Talking with others is hard for severe physically and utterance disabled person. Especially, difficulties increases on outing situation and it becomes a hard barrier for social participation.

Although several communication aids instruments are already in market, there is almost no aid for whole-body palsy patients. In this study, we developed small portable communication aid based on

PDA, for cerebral palsy patient, which can be controlled with only one switch.

The aid has phrase book that has phrases of user's every day needs, and it has note function that user can write character by character. From trial usage of the user, we found that it facilitate rapid conversation in everyday typical cases and it also facilitate deeper communication.

*Effect of cognitive ability deficits on elderly passengers' mobility at railway stations: Focusing on attention, working memory, planning*

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The purpose of this research is to understand how a deficit in cognitive functions affects elderly passengers' behaviour at railway stations. The cognitive functions we focus on include working memory, planning, and attention, which we have found to decrease independently with aging. We selected three stations and assigned four participants at each station with different characteristics in terms of the above-mentioned cognitive functions; one had no problem in the three cognitive functions, whereas each of the other three had a different inferior cognitive function. At the railway stations, the participants were instructed to carry out a main mobility task, such as transferring from line

A to B, while performing two or three subtasks such as finding public telephone, restroom, or elevator. We recorded the participants' behaviour using two video camera systems, a wireless pinhole camera mounted on the participants' hats for recording their visual view and a CCD camera for recording the whole back view. After each task, the participants were interviewed for their background knowledge, explanation of their behaviour, etc. The results showed that the participants with inferior planning function consistently had serious problems in performing the tasks. This indicates that special considerations are needed to support these people.

*The difficulty in using automatic teller machines for young and older people*

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In Japan, automatic teller machines (ATMs) of banks became familiar to draw cash from the users' accounts. However, it is still difficult for many people to perform cash transfer using the machines. We investigated the several kinds of present ATMs installed at bank stores and made a structure analysis from the video recordings during the operation of cash transfer. As a result, we found that important factors of the difficulties came from the gaps between the user's mental model of the procedure and the displayed information

on the screen. Some transfer items, such as numeric buttons, Japanese syllabary table, and the term "client" were shown in different way from the familiar ones. The user could not foresee the next stage, such as next required input, the total amount of money including charge, and the closure of the cash tray. We developed a simulator program for various combinations of operation sequence and panel layout. Then the usability experiment was carried out with young and older subjects to find where they made mistakes.

*Products usability index and its dependency on the age factor*

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We introduced systematic approaches for universal design in the rapidly ageing society at International Workshop on Gerontechnology, 2001 (Tsukuba) and we are still focusing on the ecological aspects of the universal design. Now, we are proposing the Products Usability Index, a new descriptor for the ageing people groups, using a question in the questionnaire, which is simple and smoothly performed under any kind of survey objectives. The current version of the index is named as PUI-2004.jp. We have obtained data of one thousand of ageing people through the surveys concerning ageing

life. We make great account on the correlations among answers to several questions and correlations among survey units, i.e. ageing people groups temporary called for the surveys. At the most recent proposal of the PUI-2004.jp at IFA 2004 (Singapore), we showed a presupposition that 'gathering the naturally distributed ageing people in the area of highly dense population is not so easy problem', and which was supported but not resolved by PUI-2004.jp. In this paper, we continue the other part of the proposal of PUI-2004.jp, and we show the distributions of ageing people groups.