A. GLASGOW, P.G. HIGGINS. ***Technology in the face of cognitive decline: Issues centred in cognitive ageing and interaction with complex devices.*** *Gerontechnology 2012;11(2):247;* doi:10.4017/gt.2012.11.02.187.00 **Purpose** As ageing of the world's population accelerates, it is increasingly important for product developers to be aware of how age-related perceptual and cognitive issues impact on ability to successfully control complex multi-functional products such as microwaves, televisions, smart phones, washing machines, and other devices in the home and in the workplace. The dynamic nature of cognitive decline, within and between individuals, is difficult for product developers to account for, and to counteract through design. To address design issues concerning older adults more effectively, stronger awareness of relationships between user capabilities and the means for interface control is needed. This paper addresses conceptual issues relevant to design for human interaction. Human capabilities associated with visual search, inhibitory control, attention, working memory, and mental models plus self-efficacy form the foundation for rational assessment of interaction requirements for the design of displays and controls of products. The aim is develop practices for designing interfaces that adapt in real time to the needs and capabilities of the user based on dynamic assessment of perceptual and cognitive interaction. **Method** Common forms of age-related cognitive decline (e.g. mild cognitive impairment) and interaction with everyday technology form a context to examine relationships between waning cognitive abilities and their normal role in essential skills required for interaction. A test battery for measuring interaction capacity is created through examining general age-related decline in verbal ability, numeric ability, verbal memory, spatial orientation, perceptual speed, inductive reasoning, and self-efficacy against tests of ability to attend to target(s), ability to inhibit forms of distraction from task, ability to integrate (bind) visual features into meaningful associations, ability to recall or reprocess operational and visual information, ability to multi-task, and perceived self-efficacy of memory. Relevant literature from cognitive psychology, human factors, human-computer interaction, vision science, memory science, neuroscience, and cognitive ageing is discussed in support of specific test methods as a valid skill assessment model. Particular emphasis is placed on current topics regarding attention, inhibitory control, and visual search. **Results & Discussion** Literature review indicates specific test methods are capable of providing measures to assess major skills required for interaction with complex environments. Presented assessment methods within the test battery consist of the operation span task (OSPAN), and Corsi-block task as indicators for operational working memory and visual working memory, the trail-making test as an indicator of ability for multi-tasking, the abstract (graphic-based) test of inductive reasoning as an indicator for pattern recognition in display and control media, the flanker task as a multi-faceted assessment of feature binding, ignoring distracting interference, and attending to a unique target, and the multi-factorial memory questionnaire as an assessment of memory self-efficacy and a potential indicator for self-efficacy regarding other major interaction skills. Latent-trait analysis offers a method of tracking cohort-based mental models of operation for devices commonly found in modern homes over the last 6 decades. Use of this test battery is conceptual and further empirical validation of the model is required. Product developers empowered with access to statistical models of interaction ability and cohort-based conceptual notions of control will have a stronger capacity to design interactive products through applied display and control techniques supportive of extending cognition for individuals who may be experiencing forms of cognitive impairment. Certain newer technologies, such as eye tracking, when used in conjunction with pattern tracking of device use and ability data, offer the potential for real-time assessment of interaction skill and ability to comprehend device functionality through monitored effectiveness of externalized perceptual and cognitive support techniques. Power to assess these factors in real-time facilitates dynamic management of display and control intervention through manipulation of useful field of view, target fidelity, state recognition, positive reinforcement, and cueing stimuli for attention capture, response support, and schema development.

Keywords: perception, cognitive ageing, technology, interaction design
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Full text: No