Older adults’ attitudes toward assistive technology
The effects of device visibility and social influence

Chaiwoo Lee
ESD. 87
December 1, 2010

Motivation

Long-term research questions
• How can technological devices and systems for older adults be designed and developed to increase the likelihood of adoption and use?
  – What are the barriers to older adults’ technology adoption?
  – How can needs and expectations of older adults be effectively identified and assessed?
  – In what ways should the process of development for older adults differ from that for the general population?

Research advisor: Dr. Joe Coughlin
Committee chair: Prof. Oli de Weck

Current topic
• “Ten perceptions on misperceptions of older adults’ technology adoption and use” (Lee & Coughlin, writing in progress)
  – A literature review
  – Identifying a set of goals that have to be met to ensure adoption
  – Previous studies are mostly exploratory
Theoretical background

Technology Acceptance Model; TAM (Davis 1989)

- Extension of TRA; Theory of Reasoned Action (Fishbein & Ajzen 1975)
  - A person's attitude, combined with subjective norms, forms the behavioral intention
  - Revised to include perceived behavioral control (Ajzen 1991)
- Framework empirically developed for user acceptance of information technology
- Factors that determine users' decision about use of new technology
  - Perceived usefulness: will it enhance job performance?
  - Perceived ease-of-use: will it decrease the effort required to do the job?

Theoretical background

Studies extending from TAM

- TAM provided a theoretical background to studies in technology adoption
- Empirical studies on adoption of other types of new technology
- Other factors that affect technology adoption
  - Social influence: peer support and social norms (Venkatesh & Davis 1996; Robinson 2006)
  - Individual characteristics: demographics (Woolhead et al. 2004; McCloskey 2006; Morris & Venkatesh 2006; Porter & Donthu 2006; Forrester Research 2009)
  - Product features: purposes, functional features and design (Sarker & Wells 2003; Forrester Research 2009; Mitzner et al. 2010)
- Mediating factors: attitude toward technology & perceived compliance to social norms
Older adults and technology

Social perception of aging

• Stereotype: weak, dependent and non-technological (Conci 2009)
• Substantial amount of studies contradict the stereotypes
  – Older adults do not reject technology any more than younger people
  – Pursuit of independence, active lifestyle and social connection

Different characteristics, needs and expectations

• Changes in physical and cognitive capabilities due to aging
• Less likely to use technology for the sake of using it

Assistive technology

• Technologies developed and integrated into products and services for the purposes of providing assistance to older adults in terms of health and everyday life
• Possibility of stigma as a barrier to adoption
  – Adoption is hindered if device is obtrusive or indicative of age and dependence (Gooberman-Hill & Ebrahim 2007; Walsh & Callan 2010)
  – Reluctant to use when seen as admission of restricted autonomy (Kang et al. 2010)

Research questions

Hypotheses

• Because of the social perception of aging, the degree to which an assistive technological device is physically visible and indicative of its purposes influences older adults’ attitudes toward adoption and use
• The effect of visibility will differ among age groups in that it may influence attitudes toward adoption to a lesser degree
  – Correlation between perception factors will differ among age groups
  – Relative importance of perception factors to adoption will differ among age groups
Collecting key value terms to be used as variables and indicators in the questionnaire

- Previous studies used various indicators as measurements of perception factors
  - Usefulness: helpful, quality, productivity, effectiveness, self-actualization, utility, outcome, performance, etc.
  - Ease-of-use: errors, efficiency, frustrating, confusing, flexible, cumbersome, understandable, unexpected, time-consuming, learnability, controllable, etc.
  - Social norms: opinions, ashamed, embarrassment, confident, pressure, etc.
- Previously used indicators are for the general population, and different types of technology have used different terms
  - Finding, selecting, merging and re-wording variables appropriate for evaluating assistive technology
- Getting comments on the topic for interpretation of statistical results
Study design

**Quantitative data collection**

- Questionnaire based on results from qualitative data collection
- Questionnaire for selected assistive technological devices
  - Selection of devices that vary in physical visibility
  - Description on purpose and use of each device followed by questions
  - Same questionnaire for all devices
  - The order in which the devices are presented: random
- To a sufficiently large number of people divided into age groups

**Data analysis**

- Statistical analysis for testing hypotheses and modeling
  - ANOVA for comparing responses for devices
  - ANOVA (when 3 or more) or t-test (when young vs. old) for comparing responses from different age groups
  - Multiple regression (when attitude is scored) or logistic regression (when attitude is binary) for modeling the effect of perception factors on adoption
  - Path analysis for illustrating the effects between variables