Aspects of Human-Computer Interaction with Older People

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Contents

- **Overview:**
  - This is a “special” seminar
  - The seminar is based on two papers
  - HCI & older people in a nutshell

- **Content:**
  - Two journal papers related to my PhD
  - Discussion
Special seminar and contents

- “Special seminar”:
  - Students have to write a review of one paper on which the seminar is based

- This talk is based on 2 papers:
  - Telling the story of older people e-mailing: an ethnographical study
  - Selective attention in web forms: an exploratory case study with older people

- Both present results of my PhD
HCI & older people in a nutshell

**Context:**
- Older people are important users
- ICT play a dominant role in society
- ICT are not accessible to older people

**Some research areas:**
- Hardware (I/O devices...)
- Software (e-mails, phones, DTV...)
- Training, Ambient Assisted Living...
HCI & older people in a nutshell

- **Widespread research approach:**
  - To compensate for age-related changes in functional abilities & studies carried out in laboratories

- **A gap in this approach:**
  - How do older people interact with ICT in their daily lives?

- **My PhD aimed to fill this gap:**
  - By doing ethnography
  - By combining ethnography with experiments
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Telling the story of older people e-mailing: an ethnographical study

Sergio Sayago, Josep Blat

*International Journal of Human-Computer Studies*

Vol 68 (2010), JCR=1,769; Quartile=Q1; p:105-120
Context, gap and relevance

- **Communication** is key in ageing
  - Isolation; participation; family
- **E-mailing is a real-life activity**
  - Our participants were very keen on it
- **Inconsistent results:**
  - SeniorMail, SimpleMail and Cybrarian
- How do older people e-mail???
The ethnographical study: methodology

- **Classical ethnography:**
  - A 3-year ethnographical study with 388 older people
  - In-situ observations, formal and informal conversations

- **Grounded Theory:**
  - A style of doing qualitative analysis
  - Analysis can begin with very little data
  - Analysis carried out while gathering data
The ethnographical study: Grounded Theory

- **Open coding**:  
  - Speculate about data  
  - Believing everything and believing nothing

- **Axial coding**:  
  - Texture of relationships  
  - Categories

- **Selective coding**:  
  - Categories linked to the core category
The ethnographical study: methodology

- **Experimental ethnography:**
  - Quantitative (numbers) and mixed studies (numbers + words) in 10 adult centers in Catalonia

- **Coverage of ICT and HCI:**
  - E-mail; online forms; websites for older people; guidelines for web accessibility, methods...
The ethnographical study: participants and venue

- **Àgora**
  - A 20 years-old participants’ association
  - Rooted in a working-class neighbourhood
  - Social inclusion (older people, immigrants)
  - Informal, “real-life” and free learning
  - Monthly enrolment over 1400 people

- **Participants**
  - 388 older people using the web in their lives
  - Digital illiteracy & low levels of education
Findings > Socialisation

Individual activities are turned into social ones

- Motivation to use ICT is to **socialise**
  - Physically & mediated by ICT
- E-mailing becomes a **social activity**
- Different from us
  - but similar to the shared use of mobile phones by teenagers
Findings > Inclusion
Technologies rejected if they increase exclusion

• A special mouse?
  - The mouse is difficult to use, but why do you think I can’t use it at all?
  - **Being old does not mean being a disabled person**
  - I do not want to feel or give the impression I am an **extraordinary person**

• A joystick?
  - My children and grandchildren do not use it to e-mail

• This challenges developments done in labs in industry and academy
Findings > Independence

*Inefficient* use in favor of independence

- Independent individuals in their adulthood and want to be so in their old age with ICT
- There is no need to hurry; time is less important than failing to remember steps (errors)
- This is at odds with the traditional productive model but concurs with recent trends in HCI
Findings > “experienceful”
Interactive experiences beyond technophobia

- Current views: “older people are less likely to be excited by or desirous of learning to use unfamiliar technology” (Newell, 2008)
- Older people’s view: the feeling of accomplishment after having done something difficult; the thrill of receiving e-mails from people they love, feeling still active and useful...
Findings > Patterns of use

- Don’t e-mail unknown people
  - Traditional (and safer) strategies

- Different / common patterns
  - Grandchildren (Spanish omelet) vs Friends (this joke is hilarious!)
  - Serious issues are dealt with by phone

- Increases contact
  - Phone conversations; chats in the bar

- Ups! BCC is not needed at all
  - We e-mail people we know
Findings > Accessibility barriers
Cognition is more important than vision

- Failing to remember steps or making mistakes hinders independence
- Enlarging elements can make them feel extraordinary as well as increasing cognitive demands (e.g.; assistive technologies, TAB navigation)
- Putting reading glasses on or getting closer to the screen when the text size is not big enough to be read easily
- Changes in cognition are corrected by taking notes and a lot of practice!
Some implications for research

- Compensating for age-related changes in functional abilities is not all that matters
  - Older people want to be independent, ordinary and social computer users
- This requires grounding interaction in real use and in natural social contexts
  - Ethnographical approaches
  - Study prolonged interactions
  - Social and oral methods
Some implications for design

- **Diminishing the cognitive load** is much more important than making things bigger
- **Consistency**
  - Recognizing versus remembering
  - Terms versus icons
- **Design for interactive experiences**
  - Affective interfaces (grandchildren, close friends)
- **Social and inclusive** interfaces
Selective attention in web forms: an exploratory case study with older people

Sergio Sayago, José-Maria Guijarro, Josep Blat

Behaviour and Information Technology

iFirst (2010), JCR=0.9; Quartile=Q3; p:1-14
Context and motivation

- **Web accessibility**
  - Online forms are key elements of online interactions
  - Very little research on the accessibility of online forms for older people

- **Previous study**
  - Asterisks did not help older people distinguish between mandatory and optional fields
  - Other strategies based on reducing cognitive load did help them fill in forms correctly
Previous study

- N=7; 65-75
- 30-minute instructor-based training
- 2 errors on average in the first form; 0 errors in the second
- Few users; unrealistic forms...
- The results seemed to highlight the relevance of selective attention
Relevance

- **Selective attention:**
  - Is age-sensitive
  - Providing clues, using different sizes and reducing the amount of information impact on selective attention in ageing
  - Very little is known about the role of selective attention in filling in web forms

- We aimed to understand selective attention in filling out web forms
Overview of the study

- **Participants:** 88 older people
  - 70 recruited in Àgora
  - 18 recruited in an adult centre in l’Hospitalet de Llobregat
  - They had no previous experience with web forms

- **Training:** 10 sessions during 6 months; guides...
Overview of the study

- **Evaluation materials:**
  - Modified versions of Hotmail, Yahoo! and Vueling forms
    - Baseline = standard asterisks
    - Large asterisks = 2 * standard asterisks’ size
    - Textual labels
    - Binary classification
  - Evaluation platform (MySQL, JSP)
  - Consent form (ethics)
Overview of the study

- **Evaluation procedure:**
  - The same laptop was used in both environments (MacBook, Intel Core 2 Duo, 2GB RAM)
  - Participants were randomly distributed
  - 40 participants filled in two web forms (Hotmail and Vueling) – due to difficulties in recruiting
  - Automatic control of errors
  - Post-test interview
Overview of the study

- **Quantitative analysis:**
  - One-way between-subjects ANOVA (for Hotmail, Yahoo! and Vueling)
  - Independent variable: way of marking fields
  - Dependent variable: # errors

- **Qualitative analysis:**
  - Grounded Theory
Findings > Quantitative

Yahoo! forms

- **Main effect**: \( F(3,47) = 6.352; \ p < 0.001 \)
- Tukey HSD **post hoc comparisons** between 3 and (0, 1 and 2) gave significant differences (\( p < 0.05 \))
- However, there were no significant differences between 0, 1 and 2
- \{0 = Standard asterisks; 1 = Large asterisks; 2 = Textual labels; 3 = Binary classification\}
Findings > Quantitative

Hotmail forms

- **Main effect:** \( F(3,39) = 6.360; p < 0.001 \)
- Tukey HSD *post hoc comparisons* between 3 and (0, 1 and 2) gave significant differences \( p < 0.05 \)
- However, there were no significant differences between 0, 1 and 2
- \( \{0 = \text{Standard asterisks}; 1 = \text{Large asterisks}; 2 = \text{Textual labels}; 3 = \text{Binary classification}\} \)
Findings > Quantitative

Vueling forms

- **Main effect:** $F(3, 39) = 10.534; p < 0.001$
- Tukey HSD post hoc comparisons between 3 and (0, 1 and 2) gave significant differences ($p < 0.05$)
- However, there were no significant differences between 0, 1 and 2
- \{0 = Standard asterisks; 1 = Large asterisks; 2 = Textual labels; 3 = Binary classification\}
Findings > Qualitative

- Participants’ objective was to fill in all the fields – (errors, dependence)
- However, revealing personal information was an issue; especially, with asterisks
- Time was not important
- Previous life experience = binary classification
Some implications

- The way of marking fields impacts significantly on the accessibility of online forms for older people
  - 3 web forms and 2 different contexts
- “Making things bigger” do not always improve accessibility
  - Online forms (and e-mail systems)
- More research (other forms...)

Selective attention...(12/12)
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Areas

- **E-mail systems (communication)**
  - E-mail is very important
  - Communication with restricted members of their social circles

- **Online forms (cognition)**
  - They are not accessible
  - Asterisks are not the best way for older people to distinguish between required and optional fields

- **Cognition > Vision**
Methodologies & users

- **Ethnography**
  - General vs Particular
  - The challenge was to do ethnography
  - Ethnography is useful in HCI & older people

- **Mixed studies**
  - Laboratories are very difficult
  - Numbers and words

- **Profile of participants**
  - Representative and not representative
Older people as ICT users

- **Nowadays**
  - Regarded as a mere collection of factors
  - “Make this bigger; ask them to come to our lab; do this task; we have results; our system is better than a similar one”

- **From my PhD**
  - They should be regarded as social actors
  - Go where they are (real-life environments)
  - Evaluate use and interactions over time
  - Combine “out of” with “in” lab-based studies
Material

- **My PhD dissertation:** “Human-Computer Interaction with Older People: From Factors to Social Actors”, www.dtic.upf.edu/~ssayag/thesis

- **Two papers:**

- **A paper related to both of them:**