

The Usability of Water Faucet for Older Adults with and without Dementia: How Important is Familiarity?

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Importance of Familiarity for People with Dementia

Dementia-friendly Design

Compensate for limitations

- Impaired memory;
- Impaired learning;
- Impaired reasoning;
- Higher levels of stress;
- Increased dependence on (impaired) senses (e.g. hearing and sight)¹

Capitalise on capabilities

- long-term memory
- Implicit memory²



Familiar Design
arguably the most important design principle for users with dementia

- Products designed for people with dementia should focus on making use of functional abilities while supporting diminished ones by *incorporating features that would be recognizable or familiar to users based on their previous experiences.*³
- The concept of familiarity and its impact on helping older adults with dementia preserve independent functioning has been extensively explored in architectural and environmental design⁴, but has not received much attention within the field of product design.

Research Objectives

This research will examine how cognitively intact and impaired older adults use five different faucet designs to:

- Provide insight as to the impact of familiarity on the usability of different water faucet designs by older adults with a cognitive impairment.
- Produce data to develop preliminary guidelines for to inform design practices for water faucets as well as other related hardware and controls.

Research Questions

With respect to older adults with different levels of cognitive abilities:

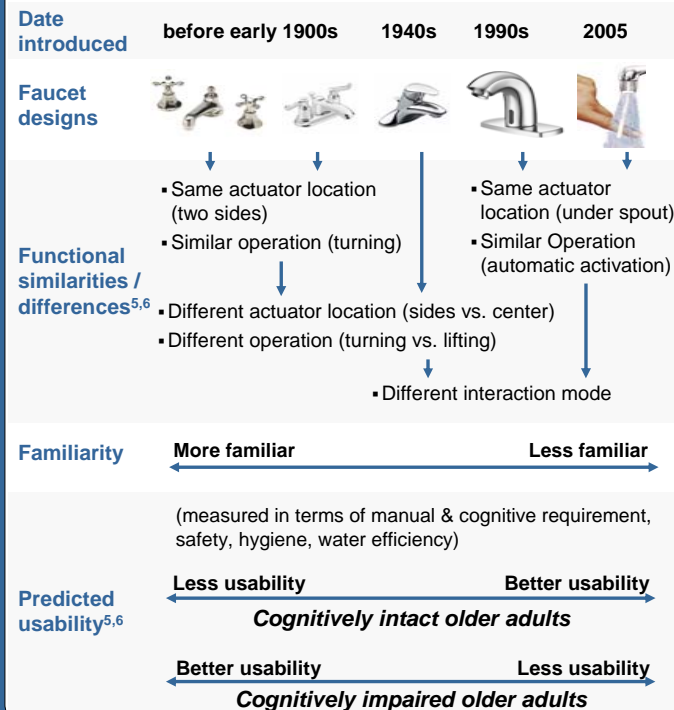
Q1: How does familiarity affect an older adult's ability to learn to use a new product?

Q2: What aspects of familiarity affect the use of a new product?

Q3: Can intuitive design be used to facilitate the use of a new product?

Water Faucet Designs

- Function:** to release a flow of water at an appropriate speed and temperature when turned on.
- Anatomy:** 1) a mechanism for activating the flow (e.g. a crosshead, knob, lever, or an electronic eye); 2) a spout for the water; 3) when control over temperature exists, identification mark or color code for hot and cold.
- Usability:** 1) ergonomically sound, i.e. easy to manipulate in terms of physical requirement; 2) cognitively usable, i.e. operation is visible and intuitive at a glance.



Experimental Design

Independent Variable 1 Faucet Design



Independent Variable 2 Subjects' level of cognitive impairment: 1) none, 2) mild, or 3) moderate

Dependent Variable Usability of faucet for the task of hand washing

- #### Within-Subject Design
- 10 subjects for each population (see Independent Variable 2)
 - 10 consecutive trials for each subject on each faucet design

- Each trial includes two scenarios:
- 1) Ask the subject to wash their hands;
 - 2) Ask the subject to complete particular faucet-specific tasks (i.e. turn on/off water, adjust flow/temperature)

Usability will be assessed by measuring and analysing:

Effectiveness

- Accuracy
 - Location
 - Operation
 - Outcome
- Completeness
 - Without assistance
 - With verbal prompt
 - With demonstration
 - With hand/hand help
 - Done by caregiver

Efficiency

- Task Time
 - Turn on faucet
 - Adjust flow
 - Adjust temperature
 - Turn off faucet

Satisfaction

- Observation
 - Subjects' comments and questions
 - Unusual reaction and behaviour
- Interview
 - Ease of use
 - Design features
 - User preference

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