

# 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)<sup>1</sup>

#### Capitalise on capabilities

- long-term memory
- Implicit memory<sup>2</sup>



**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*.<sup>3</sup>
- The concept of familiarity and its impact on helping older adults with dementia preserve independent functioning has been extensively explored in architectural and environmental design<sup>4</sup>, 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:

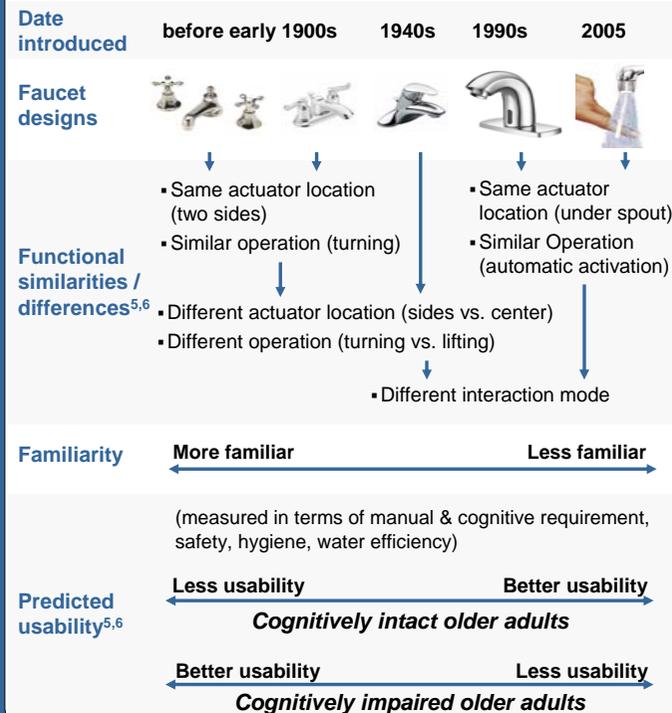
Q1: How does familiarity affect an older adult's ability to learn to use a new product?

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

## References

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