INTRODUCTION

- Smart technologies that extend the amount of time that individuals can live independently by increasing functional independence are of significant value.
- Older adults prefer an independent lifestyle and autonomy in their homes.
- Prompting technologies can be used to help older adults complete IADLs and maintain a greater sense of independence and daily functioning.
- Usage of recorded human voices are natural, acceptable and less stressful than machine voices.
- Phones can be carried around and outside the home as opposed to a touch screen anchored in a central place in the house.
- Prompting technologies may be used to help older adults complete IADLs and maintain a greater sense of independence, improve daily functioning, and minimize caregiver burden.
- We expect that young adult participants will rate PUCK on a smart phone more positively than PUCK on stationary laptop computers.

DESCRIPTION of PUCK

Prompting Users and Control Kiosk or PUCK is a prompting system developed at the CASAS Lab with a goal of reducing caregiver’s burden to give any form of intervention to a smart home inhabitant so that an activity could be completed successfully.

PUCK Service

In order to ensure that PUCK reaches the mass and proves to be helpful for both the caregivers and the users, this project aims at developing an infrastructure to communicate with the phone in real time.

Caregiver Web Interface

- A caregiver would be able to control the cuing instructions using a web interface from a distant location.
- The rules that the caregiver chooses can be both time based and context aware.

Phone Application

- The Android phone application is used to deliver different modes of prompts like, audio, video and multimodal, to the user.
- For now it would be fully within the range of the smart environment wireless network.

EXPERIMENTATION METHODOLOGY

Participants

- Participants will be recruited from the Psychology Subject Pool at Washington State University and from the general population of healthy younger adults.
- Exclusion criteria will include a history of head trauma with permanent brain lesion, current or recent (past year) psychoactive substance abuse, history of cerebrovascular accidents, and known medical, neurological or psychiatric causes of cognitive dysfunction (e.g., epilepsy, schizophrenia).

Procedure

- Participants will complete IADLs IADLs within a smart environment (Table 2). Using a graded hierarchy (e.g., indirect, direct, multimodal), cues will be generated for each step needed to complete the 6 IADLs.
- Participants will perform the activities six times each.
- In addition, in some of the cases the participant will simulate an activity error such as wandering, skipping a step, or using an incorrect tool.
- When our Smart Environment detects an error in activity completion an audio prompt will be automatically played that directs the participant in the correct way to complete the task.

Table 1: Six Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
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<tbody>
<tr>
<td>General/Handyman Activity</td>
<td>Sweep the kitchen and dust the dining room and living room.</td>
</tr>
<tr>
<td>Water Plants</td>
<td>Fill a watering can and water the plants located around the apartment.</td>
</tr>
<tr>
<td>Meal Preparation</td>
<td>Fill a glass of water and prepare a bowl of soup for a friend.</td>
</tr>
<tr>
<td>Hygiene</td>
<td>Wash hands in the kitchen sink, choosing correct soap and using paper towels to dry.</td>
</tr>
</tbody>
</table>

ANTICIPATED OUTCOME

- We will compare our questionnaire data with data from participants in a similar study who will receive cues through stationary laptop computers in the smart apartment.
- We anticipate that participants who receive cues through the phone interface will respond more positively than those who receive cues through laptop computers.

FUTURE WORK

For our current work we could run a simple phone application that plays the prompts on the basis of a predefined time. As a part of the work over the next semester, we would have a fully functional phone application. We would also have the caregiver web interface ready so that we can test on the experience of the caregiver. We have the fully functional server that would be used in this study. However, the smart phone middleware interface needs to be finalized.

Acknowledgements: This work is supported by grants from the Life Sciences Discovery Fund; NSF DGE-0900781; and NIHIB R01-EB009675