



# Enhancing Independence: AI Voice Assistants and Smart Home Technology for Older Adults with Long-term Mobility Disabilities

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# Do You Prefer to Stay in Your Own Home as You Age?



Image Source: Freepik

# Assistive Technology with AI



Amazon Echo Show



Smart Refrigerator



Nest Learning Thermostat



Smart Pet Camera

# Can Older Adults Easily Learn **New** Technology?



# Development of User-centered Instructional Manual

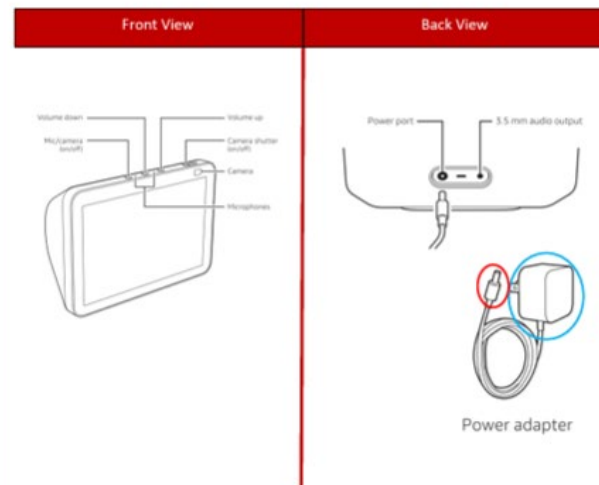
## Setting up

### Step 1 of 27

First, you will need to remove the Echo Show and power adapter (see image below) from the box and remove any plastic wrap. You may discard this wrap.

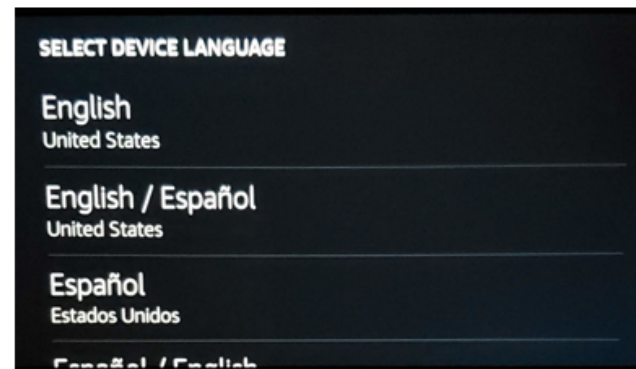
Then, plug the power adapter into the Echo Show. The smaller end (circled in red) plugs into the back of your Echo Show device and the bigger end (circled in blue below) goes into an open power outlet.

- Note that, depending on which Echo Show device you are using, there may be some slight differences in the location of the buttons and ports on the device. Also, this device **does not** have a power button to turn on. Instead, it will begin to work once it is plugged in. Starting the device for the first time might take about 60 to 90 seconds and it will proceed automatically.



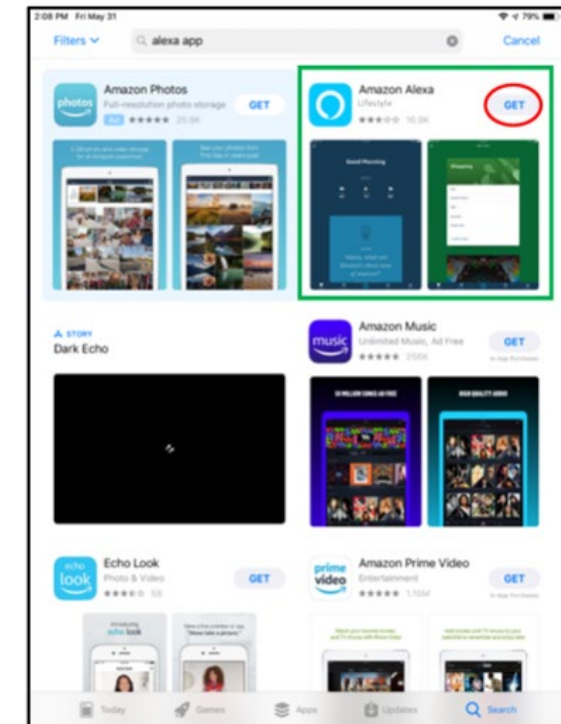
### Step 5 of 27

Once turned on, the device's screen will show a language selection. Choose the language that you would like to use for this device by tapping on it.



### Step 4 of 21

You should see the "Amazon Alexa" option that matches the version below (outlined in green). Next, click on the "GET" button (circled in red) to start downloading the application to your iPhone or iPad.



# Development of User-centered Instructional Manual

## Social Communication

### Using Alexa to Call on the Echo Show

You should now be ready to use your Echo Show for calling! Now that your Echo Show device knows the names of your contacts from your smartphone Amazon Alexa app, you can use both your phone and Echo Show Device to call other mobile phones and Amazon Echo devices.

If you follow this guide, you should be able to complete a call from your device for the first time in just a few short steps and less than 15 minutes.

The first pair of features, *Echo-to-Phone Calling* & *Echo-to-Alexa Calling*, will allow you to make both telephone and video calls from your Echo Show device. The instructions contain steps for how to make calls both physically by using the screen and by using simple voice commands.

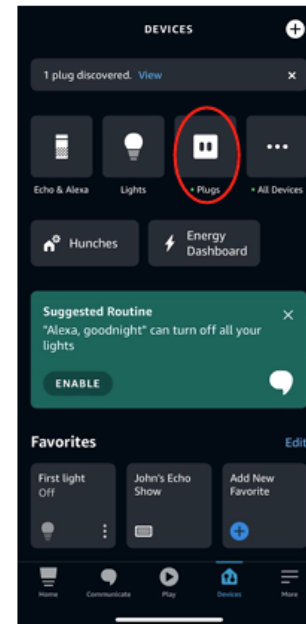
The second feature, *Alexa Drop-In*, will allow you to check in on select contacts and instantly connect from their Alexa-enabled device to their home.



## Environmental Control

### Step 19 of 22

Now that your plug is connected to your Echo Show and can be used with Alexa, you can now tap "Plugs" (circled in red) to see the plug within the Alexa application. You will now name your smart plug.



## Health App

### Example Activities

#### Example

#### #1 Finding Calories

One of the things you can do with Nutritionix is ask about nutritional information about foods.

For example, you can ask Alexa "Alexa, how many calories are in blueberry pancakes?" Your screen will then display the nutritional information.



# Development of User-centered Instructional Manual

## Overview

**WELCOME TO YOUR NEW ECHO SHOW**

We want to thank you again for participating in our research study. This postcard will briefly explain the features of your Echo Show and how to get things up and running.

**MEET YOUR AMAZON ECHO SHOW**

**What is an Amazon Echo Show?**

- The Echo Show is your own personal assistant that can help you with daily activities and entertainment at home.
- The Echo Show 8 is an 8" touchscreen that brings entertainment and convenience to you.

**What Can You Do with your Echo Show?**

- **Keep in Contact:** Make audio and video calls to your loved ones by simply asking Alexa.
- **Stay Organized :** Take a look at your calendar and reminders, and set alarms and timers.
- **Control Your Smart Technology:** Control your smart devices such as your Philips Hue or Smart Plug.
- **Get the Information You Need:** Check the weather, news, and sports to your convenience.

Feel free to ask Alexa anything and explore what you can do with your Echo Show! Practice makes perfect and will help you feel more comfortable with the device over time.

If you have any questions, please refer to the User Guide or contact Kenneth Blocker at [HFA-Lab@illinois.edu](mailto:HFA-Lab@illinois.edu) or (217) 265-0150

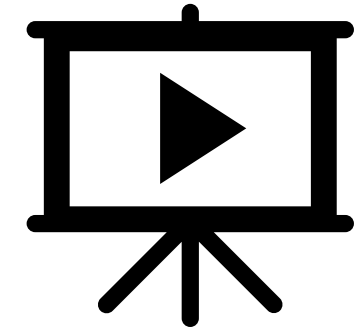


## Step-by-Step Guide

### FURTHER INSTRUCTIONS AND CHECKLIST

- 1 Connect the power adapter to the back of your Echo Show and to an outlet.
  - Wait for a few seconds and see if your Echo Show turns on and makes a sound.
  - Once the screen turns on, please wait until a message saying "Verify Account" appears on your screen.
  - Tap on "CONTINUE" and enter your Amazon account password for the following screen.
  - Once you have correctly entered your password correctly, it will take you to your home screen.
  - Ask Alexa, "Alexa, what's the weather like today?" and if you receive an accurate response, please continue.
  - Ask Alexa, "Alexa, show me movie showtimes." and if you receive an accurate response, please continue.
- 8 You are now ready to use your Amazon Echo Show!

The contents of this Postcard were developed under a grant from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR grant number 90REGE0006-01-00).



# Study Participants



Image Source: Freepik

**A total of 24 older adults with long-term mobility disabilities**

- 54.2%: females
- Mean age: 71.5 years old
- 58.3%: Multiple sclerosis



# Digital Assistance in a Box (DAB)



Echo Show 8



Smart Plug



Smart Bulb



Informational Postcards

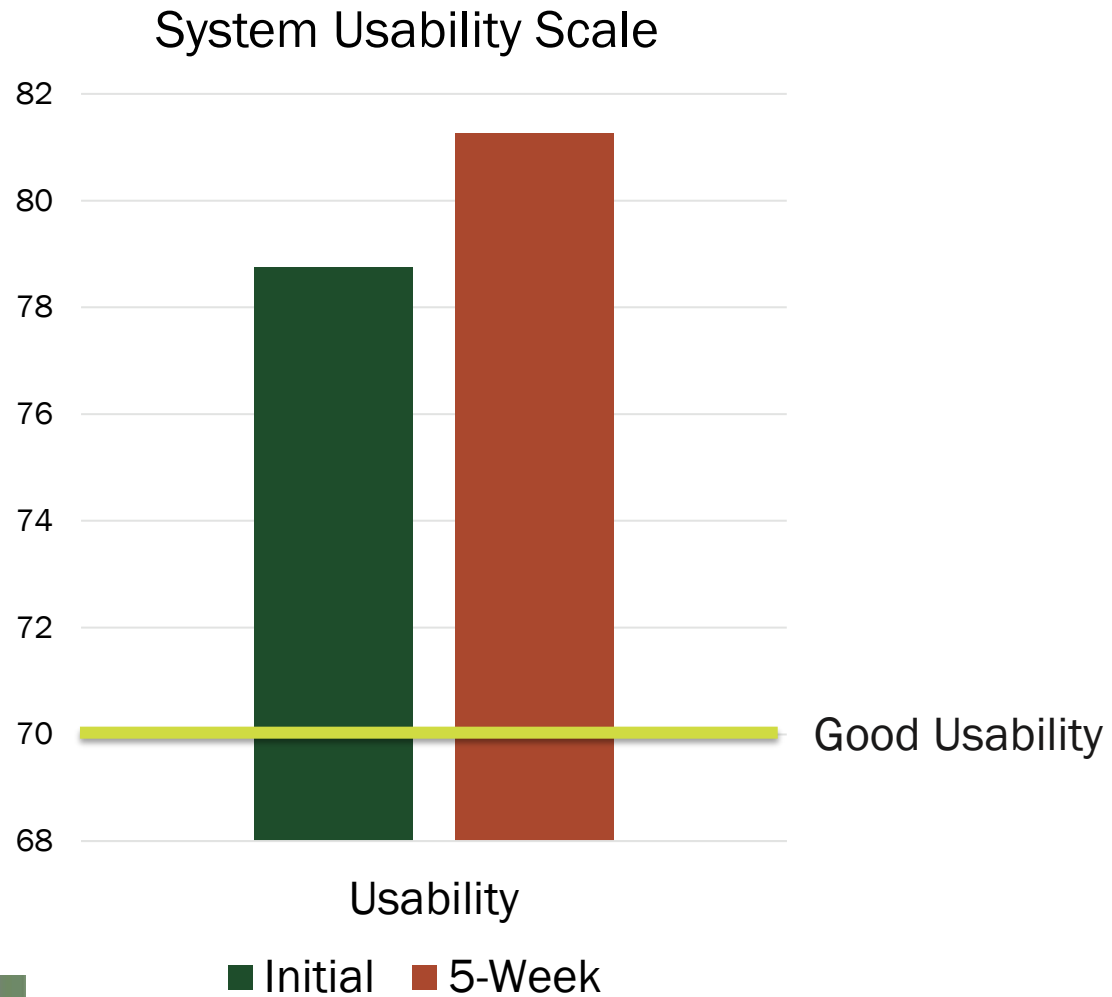


User Guides



Any questions?

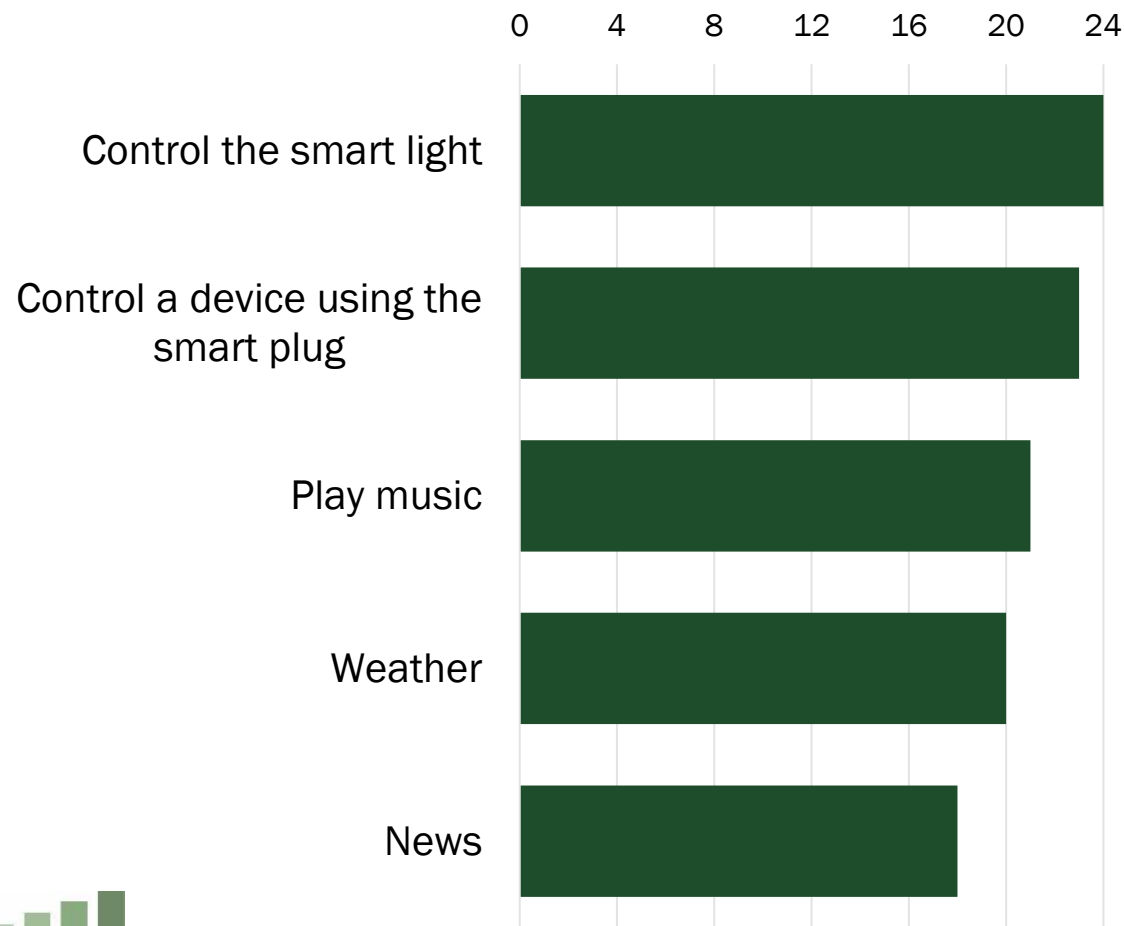
# Easy to Use



*“I feel pretty confident that they appear to be **easy to use**... Take a little more time with the Echo...Once I read up on the user guide, find out everything that it can do.” [Female, 77 years old]*

# Enhancing Independence and Safety

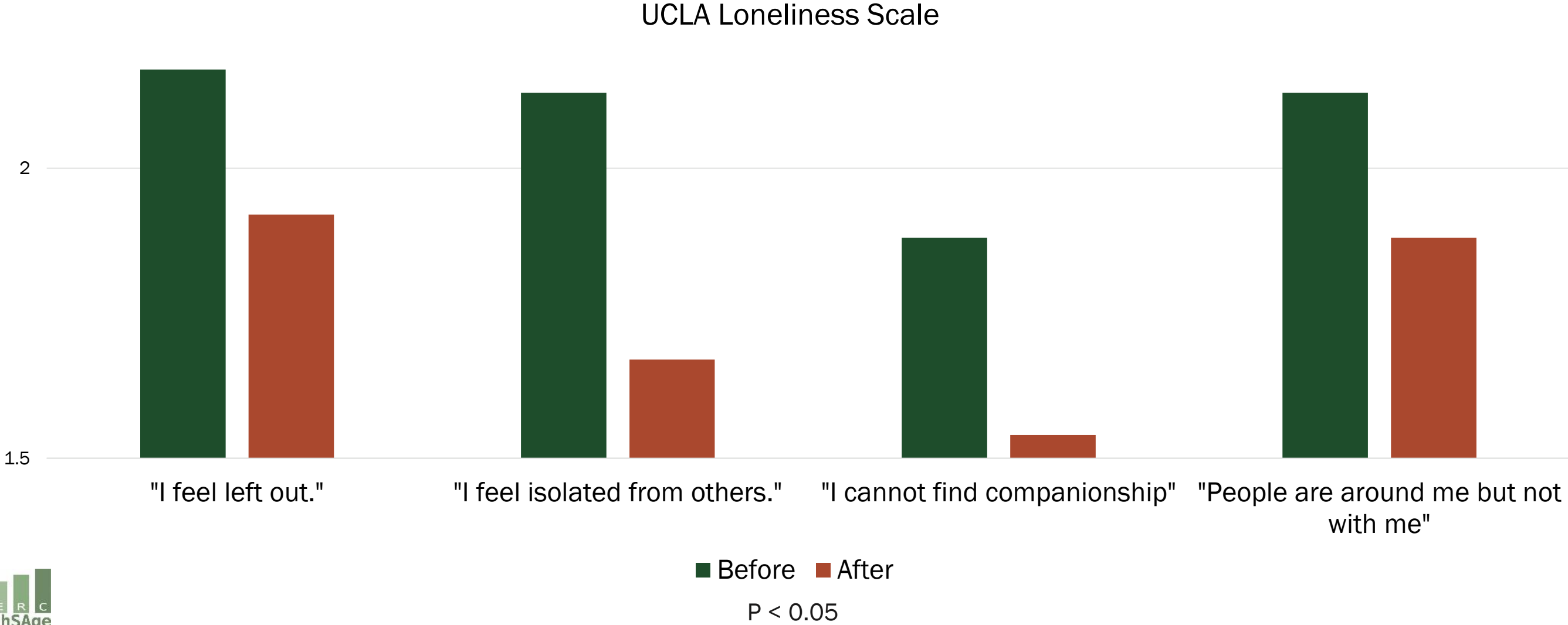
Top 5 Activities using AI voice assistants



“Being able to ask her to turn it on for me, particularly now that I’m on the walker, *I don’t have to take my hand off the walker* to hit a switch to turn something on. I walk into the room and just ask her to turn it on.” [Female, 77 years old]

“Turn on the light in the bedroom before I get up there. So, *I don’t have to worry about tripping* while I’m headed towards the lamp, which is good.” [Male, 67 years old]

# Decreasing Feelings of Loneliness



# Decreasing Feelings of Loneliness

- “One factor [that I really enjoyed] is that there's *a human element* where Alexa told me, ‘Have a good day’ this morning.” [Female, 69 years old]
- “It gives me somebody to talk to when I’m home alone...I talked to my cat a lot. She doesn’t answer me, but Alexa will answer me. So, *it’s like having another person.*” [Female, 71 years old]

# Future Direction

- A well-designed manual can help older adults overcome technology barriers, build confidence, and fully utilize AI technology.
- AI voice assistants' remote control function helps older adults, especially those with mobility disabilities, live independently and safely.
- Developing AI algorithms that initiate conversations based on individual interests and needs can reduce loneliness.

*Email me for future collaborations!*



# Thank you



**Wendy A. Rogers, Ph.D.**



**Laura Rice, Ph.D., MPT, ATP**



@TechSage\_RERC



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TechSage RERC



**Jaewon Kang, Ph.D., MSOT**



**Kathryn Huang**



**Emma Lachs**



Scan QR code  
for additional YouTube instructions



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