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Team Name: Team 5 (still in process of figuring out a name)

Target Setting: The Boston Home. The assignment did not ask for a description about the target setting, however, it is posted on Piazza with our proposed questions.

Reason for choosing the target setting: I have had prior experience of observing patients with motor speech disorder at Riverside Industries (www.rsi.org). It aims to empower people with disabilities and provide them employment opportunities. I realized that people with speech impairments get frustrated while using Dynavox partly because of their motor impairments. Dynavox is an assistive communicative device, which allows the user to tap on the icons on the screen to formulate a sentence and then synthesizes the speech for the sentence. However, for the purpose of this class we could not go back to Riverside because of the commute, and we chose Boston Home, which has quite a few residents with speech impairments. We went in with a very definite project idea in mind. We were hoping to confirm that people using a dynavox would benefit more from a limit speech recognition system, which would be tailored to their impaired speech. We believe that the caregivers of the patients understand their impaired speech as they are tuned to it and because they are only using a limited set of sentences and utterances for communicating.

Interview Questions: We had the following interview questions prepared for this exercise:

1. Has using this device impacted in your life anyway? (Grand Tour Question)
2. How often do you speak on your own rather than using your device?
3. Is there anything you would like to change about your device?
4. Can you remember a time when you are unable to carry out a conversation through this device?

5. On a scale of 1-5, 1 being unsatisfied, 5 being totally satisfied, how satisfied are you with? How long it takes you find the right sentence that you want to express when you are having a conversation?

Field Notes: (Summarized)

Session 1: -1.5 hours interviews with 3 Residents, each starting with a demonstration of how they use their technology.

-1 hour observation of a group session "The Device Group"

Session 2: -45 minutes of interviews with 2 Residents, just interview no demonstration of technology

(because of the schedule and time limitation for the speech pathologist)

Resident-1 had severe motor impairment and was unable to perform any fine motor control from her hands. She was only able to use one of her arms and her speech was quite intelligible. She conducted three demonstrations because the interview, first showed how she used the assistive phone technology by calling her brother, second she showed how she use the computer through "Dragon Naturally Speaking" to write emailed and word documents and third she showed how she used her ipad (again by using dragon software).

She controlled her computer through commands like "wake up", "go to sleep", "open Microsoft word". Her major problem with the system was the she would forget that the system was still in "accepting command mode" and she would be talking to someone else and end up with a lot of text in her email. Also while using her touch screen on the ipad she was having difficulty in reaching farther parts of the screen and was double tapping instead of a single tap due to her tremor.

She said "I wish the computer could know when I am not speaking to it", "Why is this going to the next option", "I only touched once"

Resident-2 was severely motor-impaired and her hands were balled into a fist. She demonstrated how she used her computer to check websites, write email and use skype. She used the Microsoft speech recognition system and moved her mouse by using commands like "mouse grid" to convert the whole screen into a grid and then selecting (and re-selecting) the portion of the grid by speaking out the grid number.

Her other noticeable commands were "Strike that", "Spell that" and "delete para". Her major issue was she could not see the number in mousegrid when she was fine-tuning the movement of the mouse. The more she spoke in a short time her voice would get weak and breathy and the computer would make mistakes. She said: "I wish the computer understood me better".

Resident-3 had severe motor impairment and didnt even have a joystick on his wheel chair. He was controlling it with touch buttons right under his fingers. He was using a speech recognition system (built by his family member), which allowed him to control his TV channels and computer (to check emails). His system read the emails aloud and would record which voice (for 20 seconds) as a voice attachment for a new email. He did not need to write his emails.

"The Speech Group" is a group session once every month. In this session residents with speech devices come to practice, request for cleaning and tune-up, and just general conversation with the speech pathologist. This observation, however, started with the speech pathologist introducing everyone two us and telling about each individual device that they were using. The devices were speech amplification add-ons, dynavox, and ipad (with necessary assistive software on it). The whole group welcomed us (my team) with a "Hello" from their device. One thing worth noticing was that they the people using the dynavox were unable to speak at all, and they needed the speech pathologist's help to formulate "Hello" on their device. Half of the residents in this group session were unable to speak, and others who

were speaking were quite intelligible. The motor impairment varied from complete function of the arms and hands to being able to not being able to move the hands at all. The latter would interface with technology using a puff system (their breath) or chin button.

Note: The following residents were not using any speech devices or assistive technology as a result there was no demonstration to observe. These were straight interviews but I had to change my interview questions here because my original interview questions were invalid.

Resdient-4 had mild to severe speech impairment and was severely motor impaired. However, the only technology he used was an audiobook player. The device was built around the impairment and had multiple buttons but one large red button, which the resident used to play the audio books. The resident was insistent that he did not need a speech device because he was able to speak and would like to use his own voice.

Resident-5 had mild to severe speech impairment and used a computer normally. She had received training on how to use the computer and she used it for emails, skype, taking noted about her eating habits and writing official letters to the facility. She used the computer in her room as well as in the lab. However, she had a difficult time using the computer (particularly skype) because she was unable to see the screen properly due to her sight impairment. She was hoping to be trained on the Dragon Naturally Speaking software so that her emails and documents could be composed quickly.

Implication on Design

1. Residents who were using assistive devices, either were intelligible and just need amplification of their voice or were unable to speak at all which makes our original design idea useless for this target population. Therefore, we need a different technology implementation to help them.

2. Residents usually have visual impairments, which makes it difficult for them to see normal text. Residents mentioned their inability to see large text, their font sizes on their computers were set to a larger font and the customizations in their rooms had large fonts. Our visual interface should follow the same approach.
3. Residents voice used to get too weak in longer conversations, which was noticed in all interviews, so that voice input should only have short decision trees to get them to talk less.
4. Residents had mild to severe motor disorder, so if there is a touch interface it should not involve moving across the whole screen.
5. Patients like to use skype and have difficulty in comprehending the smaller text and buttons. This is because skype is built for normal users, so a technology intervention here might be able to provide assistance to people with speech impediments and visual and motor impairments.

Tentative proposal discussion

We were hoping to find patients / residents who would:

1. Mostly be understandable only to their caregivers
2. Would be using a selected set of sentences to their total communication

However this was not the case, and based on our observations we are changing the direction of our technology. We are proposing to have an alternate interface of skype (which will use actual skype on the backend) for this target population. The interface of this skype will be designed with the target population in mind and will use pattern recognition for speech input to control skype. Moreover, this software will further allow the users to start application of interest and visit favorite webpages with voice.