T2: Ethnography

Zhichun Ye, Team 5(Developing voice recognizing system to help people communicate)

Settings and Rationale:

Founded in 1881, Boston Home is a non-profit specialized care residence for 96 adults with advanced Multiple Sclerosis and other neurological diseases. It is the only facility of its kind in New England and only one of a handful nationwide. We choose this location because it has our target population-people, who may use the assistive communication device: most patients there are on motorized wheel chairs, and have weakness in their arms; around half of the patients there have speech impairment ranging from mild to swear. Approval for the visits was obtained from staff in advance and we were given clearance to interview residents identified by the therapist.

Refined interview questions:

1. Has using this device impacted in your life anyway?
2. How often do you speak on you own rather than using your device?
3. Is there anything that you would like to change about your device?
4. Can you remember a time when you were unable to have 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?

Field notes:

We arrived there around 1:00pm. P1 was the first resident we met. He was watching TV when we walked in. We introduced ourselves and explained our purpose. P1 had labored speech but could express himself well. He has been using a customized voice control Gmail system developed by his brother and he showed us the system. There was a screen used as the monitor of computer on the wall, an x-box as microphone under the screen and a mouse beside it. The

therapist told we could use the mouse to control the system in case P1's voice wasn't recognized. The Gmail interface on the screen was simple, with a button and an input bar on the top, emails listed below in larger font size. He controlled the system by calling "move down #", "send email", "back", "scroll down", etc. Every taken in command and selected email would be read out. While doing so, system can't take in any new commands. We waited for 4 minutes until the first email was totally read. Then he tried "move down one" and "close the window" for 3 times but none were recognized. He seemed frustrated and asked us to help him to complete the task.

We conducted the structured interview with him since he's using AAC system and has intelligible speech. He's been using this system for one year, and it has improved his life because he can do things that regular people do. However, we noticed he need speak loud and may easily get tired after a sequence of commands. We guessed it might because the microphone can't capture weak voice. He admitted it happened sometime when his voice can't be recognized and he need ask the front desk for help, but he still gave 6 out of 5 of satisfaction for the system. We thought it because it's his brother who customized the system for him thus he didn't want to make more requests. But since he showed frustration when his voice wasn't recognized and said "Come on" several times during that tedious email, there did exist space for improvement. One of them will be the implementation of "quit" command. As the session is starting, we didn't ask him in more details. We thanked for his cooperation and headed to the session.

This group session is held once a month to help residents communicate and use AAC devices. There were 7 residents and 2 therapists. The therapist gave introductions about each resident and their devices. All residents used motorized wheel chair, three used iPad, two used DynVox, and two didn't have AAC device. P6 wasn't quite satisfied with her device because of the charging problem and it took her effort to turn off the microphone each time in the elevator

because of the noise it made. Later they used AAC devices to say “hello” to us. P2, P3, P4, and P6 generated it well; P8 made a typo but corrected it, P5 and P7 made mistakes because of long options. Most time residents there were listening, some were laughing. We assume they couldn’t speak verbally thus didn’t talk too much. After the session, we had a close look of P2 and P7’s device. Since their devices were typing-based and they seemed tired, we didn’t keep them long.

We came back there several days later. We met P9 who was recommended by the speech therapist. P9 was sitting in front of the computer when we arrived and he could only control his left little finger. He showed us how to use his computer. There was a large mouse at the left of the keyboard, it seemed to be specially designed because it had a very big scroll ball in the middle, which he used to control the mouse position. The OS he’s used was the normal Windows XP except for larger font size. Instead of doing the double click to open an application, he first clicked the mouse and then pressed the enter button. Each time he need adjust his wheelchair’s position to make enough space for him to switch his left hand between the mouse and keyboard. He tried 3 times to open a particular webpage by “click and press” in the history drop-down menu but all failed. He was frustrated about this, so we thanked for his quick tour and asked him some other questions. Later on we found in Mozilla you can’t open a webpage by doing this.

Since he didn’t use an AAC device, we changed to semi-structured interview. He said he used computer every night and loved using the keyboard and mouse. He hasn’t been specially trained and we guessed he might have access to this technology before otherwise he wouldn’t know “click and enter” to open an application. When asked has he ever used any application on iPad to help him communicate, he said he hasn’t but he’d like to try. Then we mentioned the idea of voice control system, he seemed interested and wanted to have that in his own computer. The confusing part was when asked has using computer helped him communicate, he repeat “I don’t

know", several times. Most time we could understand his short sentences within 2-3 words, even in weak voice. But when he wanted to ask us something, he tried several times but we still couldn't understand. We tried to repeat his questions to see if we got the right one. After several rounds, he laughed, we thought this might be the signal that he is good at short sentences but can't perform long ones, then we thanked him again and he said "Thank you" to us.

Implications for design:

1. Except for those who cannot speak, or with very severe speech impairment, most residents there are not willing to using AAC device for daily communication. Even P9, who can only speak in very weak voice and limited words preferred to talk by himself. This suggests the direction change of our goal system.
2. The Gmail system is customized for P1 with his voice pre-recorded; we can also use that pre-record scheme to train our system. For different person, we record and store their voice commands, and go into his database to search for the specific command when using it.
3. Systems that facilitate residents' basic social life (sending email, doing Skype) are popular. P1 said, "The Gmail system has definitely improved my life because I can do things that other regular people can, like sending emails and doing Skype." They also love to have a voice control system on PC, as P9 said, "I haven't used that before but I'd love to have one."
4. Since people with speech ability don't usually use AAC device, we are changing our project focus from developing a voice recognizing system to help people communicate to using speech pattern recognition to facilitate people's social life. Like use voice control to help opening email, searching favorite webpage, and doing Skype.
5. Most residents have very weak voice and no so good sight, we can have an amplifier to amplify user's voice as input and use large font size of our system interface.