Walking in Another's Shoes: Aphasia Emulation Software

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ABSTRACT

The impact of living in a world that does not understand your impairment can be frustrating and a daunting task. Consider how an individual would feel if their family, friends, or doctors did not understand or were not even empathetic to daily struggles brought on by an acquired language disorder such as Aphasia. This work seeks to shed new light on aphasia by creating an instant message client which emulates the effects of aphasia. The goal of this new system is to raise awareness, teach, and increase empathy for caregivers, family members, and doctors/therapists who work with this population on a daily basis.

ACM Classification Keywords

K4.2 [**Social Issues**]: Assistive technologies for persons with disabilities

General Terms

Human Factors

Author Keywords

Aphasia, Emulation, Empathy

1.INTRODUCTION

Receiving empathy and understanding are a constant struggle for those living with aphasia[2]. Aphasia is an acquired language disorder that can impair language (both spoken and written) affecting over 1 million Americans[3]. While there are a variety of sub-types of aphasia, the disorder can affect the word recall, sentence fluency, articulation, and language production/output. To an outsider it may appear that an individual with aphasia has lost their intellect or cognitive abilities, when in reality the damage can often be limited to their ability to communicate. This lack of understanding can "erode the social bonds that give life meaning" [2].

We hypothesize that a system could be created that would emulate the effects of aphasia through distortion of written text. Such a systems could then be embedded within an Instant Message client, allowing the user to experience aphasia during a normal form of communication with peers. Our demonstration of this system is called **A**phasia **E**mulation **S**oftware (AES). By allowing users to 'walk a mile in another's shoes,' they may gain a deeper sense of empathy for those suffering with aphasia. This can be particularly useful for family members and friends of individuals coping with the effects of aphasia or even used during the education of speech pathologists and clinicians. We present the initial prototype system of AES, its reception, and outline our second more complex system currently in testing.
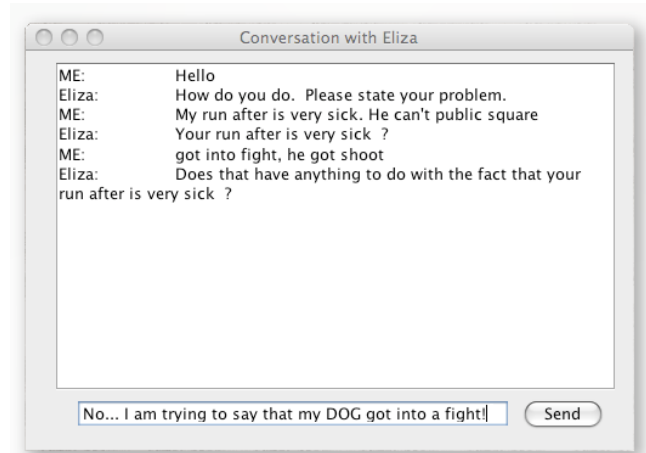
Figure 1. AES IM Chat Window and Conversation
Notice how the participant's text is hard to decipher after it has been distorted by the Aphasia Model. The participant is trying to communicate that their dog cannot walk because it is sick

2.EARLY PROTOTYPE STUDY

AES is designed to convert a user's IMs from their original message to one that appears like a message sent or spoken by an individual with aphasia. Thus, the conversation that develops between the user and their IM partner would have difficulties and hurdles akin to those experienced by an individual with aphasia. In theory, by experiencing these challenges first hand, we hope to increase empathy, knowledge, and understanding of aphasia.

To help shape the development of our AES and uncover potential applications, we conducted an informal study with students, professionals and researchers who work with the aphasia community. This initial AES system (Figure 1) was built in Java and simulated an IM conversation between the user and Eliza [5]. This initial system was quite simple providing only a rough approximation of aphasia by randomly dropping function words (16-33%), randomly dropping words (20-40%), and replacing non-function words with other random words (half of the non-function words). While this is not an accurate representation of aphasia, the distortions applied to the user's messages were of the type that are experienced by those with aphasia.

Each participant met with a researcher for one session that lasted approximately 40 minutes and consisted of an explanation of AES, a conversation with Eliza using the AES prototype, and a discussion/questionnaire with the researcher. Ten individuals (students, faculty, and professionals) with experience in aphasia (speech and hearing science, and psychology) were recruited. They averaged 10.3 years of experience in the aphasia and language disorder community. The average age was 34.6.

2.1.Response from Participants

On a 7-point Likert scale (7 agree, 1 disagree), participants responded favorably on aver to the notion that this tool could be used to teach friends (6.1), family (6.2), clinicians (5.9) and professionals (6.1) empathy and understanding towards individuals with aphasia. While these responses were positive, the qualitative feedback that we received was far more telling. For example one participant stated that:

> *This could be shown to people outside of the community of communication experts and their clients. It could teach empathy and acceptance to a group/community as a whole. -P4*

This view was echoed by other participants who suggested this software be used in politics and in activist circles as well as in general doctor and nurse training. Another participant stated that this software was critical for training in that:

> *I don't think treatment will be successful at all if the clinician is not understanding! They are the individuals who should be, and without that empathy, few gains will be achieved . -N5*

Another participant echoed N5 by stating that:

> *I believe that as a simulation of a disorder... this software could be used in classrooms as early as undergrad . -U3*

3.ADVANCED SYSTEM AND FUTURE WORK

Due to the positive response of the participants in our study, we have constructed an advanced, fully functional AES system which models aphasia based on research in psychology, and speech language therapy [1,4]. This more advanced system works over the AOL IM network, and is fully configurable across the spectrum of aphasia. This final version of AES utilizes machine learning, and natural language processing to model distortions across 12 axes. This system is currently being tested with the general population as well as trained professionals who work with individuals with language disorders (including aphasia).

4.CONCLUSION

By allowing family members, friends, and professionals experience the frustrations and difficulties that accompany a language disorder like aphasia, we aim to increase understanding and empathy of those who live and work with individuals with aphasia. This could not only improve the quality of life, but also the quality of care. AES is a fully functional system that emulates the distortions of aphasia through the use of an IM client. The initial response by trained professionals was supportive, and suggested multiple benefits of the integration of such a system in both the therapeutic and training environments.

5.REFERENCES

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