Digital Technology and Aphasia

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Holland and Matthews (1970) used the term 'teaching machines' in the first report of applying digital technology to help people with communication impairments to overcome their difficulties. Significant changes have taken place since those early days of using digital technologies in clinical practice. In the 1980s and 1990s, the availability of personal computers opened new opportunities for aphasiologists and software engineers to design and research treatments for improving language functioning (e.g., Katz & Nagy, 1984; Bruce & Howard, 1987; Crerar, Ellis & Dean, 1996). More recently, advances in smartphones, tablets, and internet connectivity, for example, have contributed to the integration of technology into many aspects of daily life, offering new possibilities for communication and working practices.

Making the most of technology to enhance the lives of people with aphasia, and understanding and removing barriers of accessing digital technology requires an interdisciplinary approach. A key aim of this special issue is to bring together authors and reviewers from aphasiology and human-computer interaction, to help build a cross-disciplinary knowledge base. Several of the papers describe collaborative projects and processes, and we hope this will inform and inspire further interdisciplinary work.

The papers in this issue span a range of topics, which reflect the diversity of challenges and interests in digital technology and aphasia. In an earlier, related special issue of Aphasiology, Petheram (2004) presented examples of how technology was being used to deliver aphasia treatment, discussed the need to critically evaluate these forms of treatment, and explored ways in which people with aphasia could benefit from and engage fully in an 'information society'. Now, just over 10 years later, we see that these issues remain just as important. At the same time, technologies that were not widely available then are now providing new opportunities and challenges. In addition, the proliferation of

technology in today's society has made the topic of digital inclusion even more important. For example, the very nature of communication through popular digital media is primarily verbal. This means that people affected by aphasia, that is, a primarily verbal disability, are likely to be excluded to a greater or lesser extent by the wonders of these media.

Along this theme, the following papers grapple with challenges of digital inclusion and the "digital divide". Menger, Morris and Salis (in press) discuss key factors that might act as barriers or enablers to Internet use by people with aphasia. Kelly, Kennedy, Britton, McGuire, and Law (in press) describe a training seminar aimed to improve computer literacy in a group of people with aphasia (cf., Egan, Worrall & Oxenham, 2004). The authors also discuss the barriers encountered by people with aphasia that prevent access and use of technology to independently self-manage their daily lives.

In addition to improving access to 'mainstream' technologies, work on designing technology specifically for people with aphasia and speech-language pathologists is also important. Interdisciplinary collaboration is particularly important here. Messamer, Ramsberger and Atkins (in press) argue for adopting inclusive design principles in rehabilitation software development. They describe a versatile application for anomia treatment and discuss the decision-making process that influenced the design of the application, based on the needs of speech-language pathologists and people with aphasia. Al Mahmud and Martens (in press) describe an email programme designed for people with aphasia, and present an analysis of the usage logs longitudinally, over a three and half year period. As well, they report users' feedback on aspects such as motivation for using the email programme, ease-of-use and usefulness of its various features, and offer suggestions for improvement.

While the inclusion of digital technologies in aphasia rehabilitation is not a new research theme, in recent years, there have been more and more studies seeking to demonstrate the effectiveness or efficacy of computerised aphasia treatment protocols. Zheng, Lynch and Taylor (in press) provide a systematic literature review summarising the evidence-base of computerised aphasia treatments. Given the ever-increasing diversity of commercial and non-commercial aphasia treatments delivered through digital technologies, this systematic review will no doubt help clinicians identify those computerised treatments that are more effective than others.

Caute and Woolf (in press) report on a single-case experimental treatment study of a person with severe acquired dysgraphia who was trained to use voice recognition software (VSR) to improve communicative writing and social participation. Their case study adds to the small evidence-base indicating that training in the use of VRS, in combination with text-to-speech software, may be an effective way to address writing impairments in chronic aphasia for individuals with relatively well-preserved spoken output. Routhier, Bier, and Macoir (in press) present two single-case studies of a therapy for verb anomia, using a tablet for self-administered treatment at home. Results showed a significant improvement in verb naming, although no generalisation was found.

Participants enjoyed using the tablet in a self-administered procedure. Caute et al., (in press) conducted a pilot study exploring the use of e-readers with four people with aphasia. They found that three of the four participants learned to use the e-reader proficiently and were positive about the technology. Equally, their study did not find any advantages for reading on the e-reader compared to paper, nor did they see any improvements in reading comprehension. It is encouraging that these papers report experiences of people with aphasia who, with appropriate training, are able to use the technologies and are enthusiastic about doing so, but at the same time, it is clear that there is a need for further work on establishing an evidence-base.

In addition to use in treatment, technology also has potential applications in measurement and assessment. Brandenburg, Worrall, Rodriguez, Copland and Power (in press) address the issue of how to measure the concept of participation in the rehabilitation of people with aphasia. They investigate the accuracy of CommFit™, a portable and usable biofeedback tool, in quantifying talk time in everyday environments, a real-life participation indicator, in a small number of healthy adults.

It has been a great pleasure to serve as Guest Editors for this special issue on Digital Technology and Aphasia, bringing together authors and work from our respective disciplines of aphasiology and human-computer interaction. With technology continuing to advance rapidly, we expect that interest in this exciting topic will only increase, and hope to see more interdisciplinary dialogue and collaboration in this area.

Acknowledgements

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