Final report summary:

Can using a virtual world help people with aphasia?

Evaluating the effects of a virtual communication environment for people with aphasia

PROJECT CODE: TSA 2011-10
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Why did we fund this research?

Aphasia is a complex disorder of language and communication. It results from damage to the language centres of the brain\(^1\), and it affects around a third of all stroke survivors, with stroke its biggest, single cause.

Social isolation is one of the long term negative effects that aphasia has on a person’s well-being\(^2,3\) and it is thought that there are more than 350,000 people with aphasia in the UK\(^1,4,5\). Therefore, new treatments and rehabilitation therapies are desperately needed to help those with aphasia stay connected with their peers and society.

Previous research suggests that speech and language therapy (SLT) can help with recovery from aphasia after stroke\(^6\). However, it also suggests that making real-world improvements in communication is difficult for these stroke survivors to achieve\(^7\).

This study investigated the use of an online, interactive 3D environment called EVA Park, which allows users to take part in virtual interactions that mirror activity from their everyday lives, like visiting the hairdresser, or meeting people in the park.

It is thought that EVA Park could be used to help people with aphasia practise social uses of language within simulated scenarios, and it might also provide a ‘safe’ environment that supports their language use, confidence and reduce their feelings of social isolation.

If successful, EVA Park could be made available to the aphasia community in the UK through stroke club networks, and on a long term basis. It might be of particular interest to stroke survivors who live in remote geographic areas, who are not able to access local groups, and also to young stroke survivors.

What did the researchers do?

Twenty stroke patients with moderate levels of aphasia were recruited to the trial. Ten patients received five weeks of immediate therapy with EVA Park. The other ten patients were first placed on a waiting list, then received the therapy 13 weeks later.

Delivering one group helped to determine whether any improvements were due to the therapy in EVA Park, or unrelated factors, such as spontaneous recovery.

Each patient was paired with a trained support worker who helped them to set everyday communication goals, and address those goals through communication activities in EVA Park. Examples included ordering food in a restaurant and making a doctor’s appointment. Patients accessed EVA Park from their homes, using loaned laptops.

Patients ‘dancing’ online in EVA Park

In addition to the goal directed activities, EVA Park was designed as a platform to stimulate conversation, and sessions were often spent simply talking.

Therapy consisted of 25 daily sessions with the support worker in EVA Park, supplemented by unlimited independent access for patients. Each week, all participants and their support workers met for a one hour group meeting in EVA Park.

All patients were assessed within weeks one, seven and 13 of being recruited to the study. At these assessments tests were used to look for recovery in all patients, and any additional effects in the group who had received immediate therapy in EVA Park.
Everyday (functional) communication of patients was assessed using the Communicative Activities of Daily Living test (CADL-2)\(^8\).

A Verbal fluency task asked patients to name as many items as they could in one minute under ten categories.

Patients undertook a conversation with an unfamiliar partner so that their use of content words (nouns, verbs and adjectives) could be measured in this context.\(^9\)

Patients were also asked to re-tell a familiar story (Cinderella). This was analysed using tests which explored the words per minute spoken and the average number of well-formed sentences.\(^10\)

Patient confidence in communicating was measured with the Communication Confidence Rating Scale for Aphasia (CCRSA)\(^11\).

The level of social isolation of patients was measured with the Friendship Scale\(^12\) and The Social Network Analysis\(^13\).

Interviews were also conducted to explore patient views about EVA Park and its perceived benefits. Where possible, family members were also interviewed.

**What did the research find?**

The findings of this study were published in the journal PLOS One in July 2016\(^14\).

Key findings included an improvement of patients’ everyday communication on the CADL-2 test, which could be attributed to use of EVA Park. For the patients who took part immediately after recruitment, this improvement was maintained at their 13 week follow up assessment.

Item naming ability with the verbal fluency task, and confidence in communication using the CCRSA scale, also improved over time for patients. However, neither improvement could be directly attributed to the use of EVA Park itself. There were no significant findings from any of the other tests used.

Patients were also found to be able to engage effectively with EVA Park technology, and both patients and family members reported very positive reactions to EVA Park in their interviews.

The work of EVA Park has continued with three further grants. The first from City University, London has been used to increase awareness of EVA Park, and engagement with it, from speech and language therapists and the stroke survivor community. This work resulted in the EVA Park project winning the Tech4Good People’s Choice Award in 2015.

A second grant from The Tavistock Trust for Aphasia has helped to improve the technology used in the EVA Park prototype and explore a wider range of treatments delivered in EVA Park.

The most recent grant was awarded by the Stroke Association as follow on funding to our original grant. The research is investigating whether volunteers can deliver group support to patients through EVA Park (Project Code: TSA 2016-05).

**What does this mean for stroke survivors with aphasia?**

People with aphasia find EVA Park fun and enjoyable to use. Therapy delivered in EVA Park may improve their everyday communication abilities.

EVA Park is in continued development to make it a viable tool to help speech and language therapists treat aphasic stroke patients.
References


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