

Virtual Reality-based Script Training for Rehabilitation of Functional Communication of Cantonese Speakers with Aphasia: Findings from a pilot randomized controlled trial

Winsy W.S. Wong^{*1}, Donald S. P. Li², Mohammad Momenian¹, Hoi Tsz KWOK¹, Cynthia M. H. Ng¹, Eric H. C. Shih¹, Leanne W. Y. Chung¹, Virginia S. W. Ku¹, & Karen H. L. Wong¹

¹ Speech Therapy Unit, Department of Chinese and Bilingual Studies, The Hong Kong Polytechnic University

² Department of Cognitive Science, Zanvyl Krieger School of Arts and Sciences, Johns Hopkins University, Baltimore, Maryland, United States of America

***corresponding author & email: Winsy W. S. Wong, winsyws.wong@polyu.edu.hk**

Introduction

Aphasia, an acquired language impairment secondary to neurological damage, limits one's participation in daily activities and affects their quality of life (Code & Herrmann, 2003). Researchers have been keen on utilizing technology (e.g., virtual reality) to enhance the treatment outcomes of speech-language therapy (SLT). The current study aimed to investigate the feasibility and preliminary efficacy of using VR in script training (Youmans et al., 2005), an SLT that enhances verbal functional communication via repeated practice of personalized content in various contexts.

Methods

A total of 39 PWA were recruited and randomly assigned to receive computerized script training with VR (n=19) or without VR (n=20). Participants attended 14 biweekly sessions of treatment, each lasting approximately 1 hour. Computerized script training was adapted from Cherney et al. (2008). In the VR treatment group, PWA fitted with a head-mounted display practiced the scripts within an immersive environment, while PWA in the non-VR group practiced the scripts with a computer screen. Performance on their trained script in terms of accuracy and efficiency served as the primary outcome, while the severity of aphasia and performance on verbal functional communication were secondary outcomes. These outcome measures were measured before, immediately after treatment, and 8 weeks post-treatment. Linear mixed models were used to compare participants' performance in the two treatment conditions at various time points. Baseline aphasia severity differed significantly between the treatment conditions; it was therefore treated as a covariate in the statistical comparisons.

Results

The number of PWA who completed treatment in VR and non-VR conditions was 13 and 18, respectively. Significant improvements in the primary outcome were observed in both conditions. When aphasia severity was controlled, no significant difference was present between the two treatment conditions. No observable gains were noted in secondary outcome

measures. Although the attrition rate was higher in the VR condition, minimal cybersickness was reported by the PWA.

Conclusions

Findings from the study have provided preliminary evidence supporting the feasibility and efficacy of VR-based computerized script training.

References

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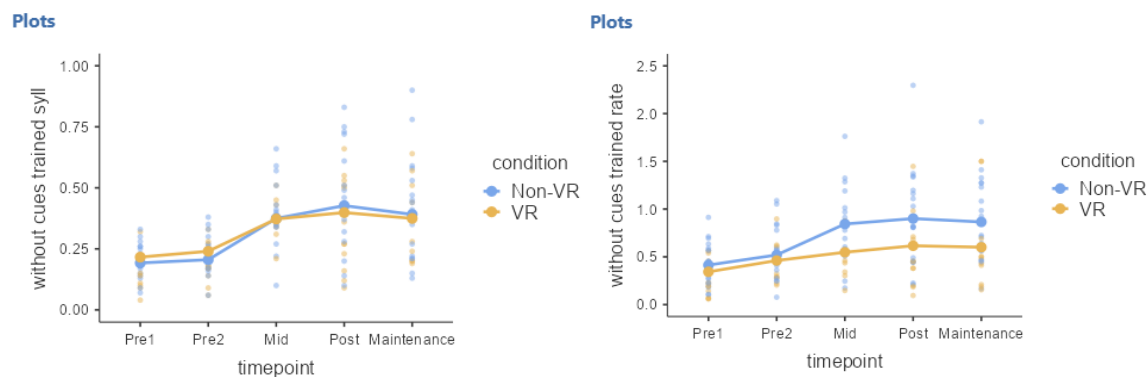


Figure 1a & b. Performance on primary outcomes (in terms of percentage accuracy and rate of production, respectively) of the two treatment conditions across time points.