

Critical Review: The Efficacy of Computer-Provided Treatment for Individuals with Aphasia

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This critical review examines the efficacy of computer use for treating individuals with aphasia. A literature search was conducted and the following designs included: review (1), randomized control trial (1), case study (1), multiple baselines (2), outcome study (2), multiple single case (1). Overall, there is limited evidence to support the efficacy of computer-provided treatment for individuals with aphasia. Many reports have found computers to be effective for this population, but only a few have applied strictly controlled parameters to be considered truly efficacious. Recommendations for speech-language pathologists as well as suggestions for future research are also provided.

Introduction

Aphasia is defined as “an acquired communication disorder caused by brain damage, characterised by an impairment of language modalities: speaking, listening, reading and writing” (Chapey, 2001, pg. 3). Both expression (e.g. speech) and comprehension of language is impaired to some extent. This disorder primarily affects older individuals and is most common in stroke survivors (Steele, Aftonomos, & Munk, 2003), while the degree and type of communication impairment incurred depend on the site and extent of brain damage. Many methods have been used to rehabilitate language in individuals with aphasia. One increasingly widespread technique involves the use of computers in therapy.

The advantages of computer-provided therapy for people with aphasia include additional self-paced and individual practice for the client. The client can also be provided with more consistent and controlled stimuli with automatic feedback (Steele et al., 2003). In addition, computers are seen as a way for individuals to gain more independence, relying less on the therapist and family (Nicholas, Sinotte, & Helm-Estabrooks, 2005). Conversely, there is the cost of software packages, computers (in the clinic as well as at home for clients in most cases), and the time spent individualizing the program for the client. Due to the focus on cost-effectiveness in clinics, the progression of such high-technology treatments in the speech-language pathology field has been a measured one (Steele et al., 2003).

Furthermore, there are constraints in the empirical efforts to investigate computer use in therapy due to limits imposed by clinical research. New therapies must first be established as *efficacious*, active in optimal environments, before being considered *effective*, active in typical conditions. Unfortunately, the terms efficacy and

effectiveness are often used interchangeably (Katz & Wertz, 1997; Wertz & Katz, 2004). Such inconsistent terminology has possibly led to many studies being erroneously labelled efficacious.

Objectives

The primary objective of this paper is to critically evaluate the existing literature concerning the efficacy of computerized therapy for individuals with aphasia. The secondary objective is to propose evidence-based practice recommendations for future research and clinical practice regarding computer use in the rehabilitation of persons with aphasia.

Methods

Search Strategy

Computerized databases including CINAHL, AMED, Communication Sciences and Disorders Dome, and MEDLINE were searched using the following search strategy: (aphasia) AND (therapy) AND (computer). The search was limited to articles written in English between the late 1990s and 2007.

Selection Criteria

Studies selected for inclusion in this critical review were those researching computer-based intervention for individuals with aphasia under controlled conditions.

Data Collection

Results of the literature search generated the following types of articles matching the selection criteria above: review (1), randomized control trial (1), case study (1), multiple baselines (2), outcome study (2), multiple single case (1).

Results

tailored to each individual. AS was a 65-year-old man who suffered a left-hemisphere cerebrovascular accident five years previous, and used the program at an aphasia centre. He underwent cued-naming and multi-modality matching exercises for verbs as well as sentence level therapy to improve subject-verb utterances. Verb naming tests were administered before each session for trained and previously named (but untrained) verbs. Performance on trained and previously named verbs improved as did the production of trained and untrained S-V utterance tasks. Another individual, SB, was a 45-year-old woman who suffered a stroke three years previous and underwent the treatment in a computer lab. Her verbal expression, auditory comprehension, reading, and writing were severely impaired. SB worked at the computer lab once a week with a trained volunteer and at home approximately 40 minutes a day, five-six days per week. Sessions included the use of a functional vocabulary set in word-picture matching and cued-naming tasks. By three years into the program, SB worked on over 100 words and was able to independently name these words with 40-80% accuracy.

Although both aforementioned case studies attempted to show the usefulness of *MossTalk Words* in real-life situations, both are missing essential information. For instance, the frequency of therapy in both cases was missing. In addition, although there were improvements for each patient, their results do not lend themselves to statistical analysis due to the lack of data given as well as the small sample size, which prevents any generalization of the results. The conclusions reached by Fink et al. also took into

account the following factors: (t)0.356301(-)5.0981(r)5.0698(r)7.140715(m)-7(y)5.0705514.7158(r)-5.00129(e)-2.64432(a)14.7158(m)-63.8585(r)-5.00129(e)-

month post-treatment indicated that naming performance remained well-above baseline measures; however, little apparent distinction existed between the two phases of treatment, suggesting that frequent versus infrequent training did not differ in the end. There were generalized improvements for untrained

by Wertz and Katz in their 2004 review, which also deduced a lack of efficacy.

Multiple Single-Case

Laganaro, Di Pietro, and Schnider (2003) evaluated the effects and feasibility of an unsupervised computer assisted therapy (CAT) for

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- Wertz, R.T. & Katz, R.C. (2004). Outcomes of computer-provided treatment for aphasia. *Aphasiology*, 18(3), 229-244.