

Preliminary evidence for modality specific attention impairment in post-stroke aphasia

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Background and aims: Currently there is increasing interest in the integrity of attention and other cognitive functions in people with aphasia (PWA) following a stroke. Although a number of studies confirm a high presence of attention impairment in post-stroke aphasia, few studies have considered the reliability of measures commonly used to assess attention in PWA, and even fewer have looked into the potential of modality specific attention impairment. This study aimed to increase our understanding of the relationship between attention and aphasia by investigating; how individuals with aphasia perform on tests of attention compared to people with no neurological impairment; the reliability of established, novel, and subjective measures of attention; whether there is a difference in auditory and visual attention ability in PWA;

Method: Forty individuals took part in this study, 20 individuals with varying types and severities of aphasia and 20 age, gender and education matched controls with no neurological impairment. Participants were examined on a battery of auditory and visual selective attention tasks, comprising two established measures (from the Test of Everyday Attention; TEA) and two novel measures, before completing a self-report measure of attentional ability.

Results: Key findings from this study indicate that PWA performed significantly more poorly on measures of selective attention compared to individuals with no neurological impairment. Correlation and regression analyses showed that whilst scores on three measures of attention were closely related, scores on the auditory TEA task did not bear close relationships to other tasks, nor were there any strong relationships between the objective and subjective measures. Arguably, the most interesting finding

from this study is that individuals with aphasia have a greater impairment of auditory attention compared to visual attention.

Discussion: The difference between PWA and non-neurologically impaired individuals substantiates previous findings that attentional ability is frequently impaired in PWA. The lack of relationship between the auditory TEA and other measures of attention might be a result of the multifactorial nature of this task; individuals are required to process linguistic information whilst simultaneously attending to relevant stimuli, the former of these being a primary deficit for PWA. The subjective measure did provide interesting information about functional limitations due to attentional impairments; however, it was potentially overly sensitive and therefore not reliable as an independent measure. The discrepancy between auditory and visual attention impairment in PWA might be a result of the type of brain damage (stroke or trauma), modality-specific processing sites within the cerebrum, lateralisation of auditory and visual processing, or most likely a complex interplay between each of these possibilities.

Implications for clinical practice: These findings indicate that language impairments secondary to a stroke are often accompanied and possibly exacerbated by an attention deficit, highlighting the importance of attention assessment alongside language assessment following a stroke. But, that clinicians should interpret results from commonly used measures of attention with caution where linguistic demands may impede task performance. Additionally, subjective measures should be used cautiously but it is noted that they do provide useful information on functional limitations as a result of attention impairments. Lastly, as visual and auditory attention may be differentially impaired, it is of paramount importance that attention is assessed as a multimodal construct in clinical settings.

Conclusions: This study builds upon previous findings and recommendations that efforts should be made to measure and use appropriate resources for measuring attention in PWA. Importantly, this study provides preliminary evidence for modality specific attention impairment in PWA following a stroke.

Clinicians working in stroke rehabilitation would be further informed by additional research that considers why modalities are affected differently, and by having access to more resources that can reliably tease apart linguistic and cognitive impairments following a stroke.