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Linguistic behaviours in adults who clutter and adults who stutter when reading and speaking

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Abstract

The breadth of behaviours that may be considered as cluttering continues to be contentious. The current lowest common denominator (LCD) definition of cluttering excludes the possibility of high level language deficits. However, recent studies suggest that those who clutter may have linguistic deficits alongside motor control difficulties. This paper reports behavioural findings from a larger data set collected during functional MRI scans with adults who clutter (AWC), adults who stutter (AWS) and controls (CTLs). Participants were asked to read short passages aloud and describe pictures. Speech data were analysed and coded for stuttering like dysfluencies (e.g. blocks) and normal dysfluencies (e.g. revisions and fillers) by two speech and language therapists. One-way ANOVAs showed that AWC use significantly more revisions than AWS and CTLs both when reading aloud and when describing pictures. AWC showed a trend toward increased co-articulation when describing a picture compared to AWS and CTL although this failed to meet significance level, AWC speaking rates was evaluated as similar to the two other groups. Results suggest that both spontaneous speech and oral reading outputs of AWC can be differentiated from AWS and CTL by the number of revisions used. We speculate that excessive co-articulation might differentiate AWC from AWS and CTLs in spontaneous speech but this does not appear to hold true for oral reading.

Keywords: Cluttering; normal non fluencies

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1. Introduction

1.1 Defining Cluttering

Cluttering is a multidimensional disorder and cannot be deemed to stem from one facet of communication alone (Myers & Bakker, 2013). However, a suitably constrained definition is prerequisite to ensure researchers and clinicians alike are working from a consistent viewpoint with the same disorder. With this in mind, St Louis and Schulte (2011) proposed the lowest common denominator definition (LCD) which states that cluttering is:

"…a disorder wherein segments of conversation in the speaker's native language typically are perceived as too fast, too irregular, or both. The segments of rapid and/or irregular speech rate must further be accompanied by one or more of the following: (a) excessive 'normal' disfluencies; (b) excessive collapsing or deletion of syllables; and/or abnormal pauses, syllable stress, or speech rhythm." (St. Louis & Schulte, (2011, pp 241-242).

This definition precludes the possibility that language components might be implicated as a core component, although some researchers believe this is a possibility (Bretherton-Furness & Ward , 2012; Myers & Bakker, 2013; Myers, 1992, 2011; Myers, Bakker, St Louis & Raphael, 2012, ; Van Zaalen, Wijnen, De Jonckere, 2011, 2009a, 2009b; Ward, 2006). St Louis, Raphael, Myers, and Bakker (2003) maintained that language was not included in his working definition as there appear to be PWC who do not have any difficulties with language. However, an examination of the LCD definition shows that cluttering can be characterized by a range of symptoms, not all of which need to be present at the same time to lead to a cluttering definition.

1.2 Motoric and Linguistic studies of cluttering

Bakker, Myers, Raphael and St Louis (2011) found that the diadochokinetic (DDK) rates of adults who clutter (AWC) do not differ significantly from that of fluent speakers (FS). The authors explain this by stating that DDK rates do not represent real speech as they are based on meaningless syllables. When the authors investigated speaking rate while reading it was found that AWC spoke at a significantly faster rate than FS but only when participants were asked to speak at a comfortable, self-generated rate and not when they were asked to speak quickly. Bakker et al (2011) interpret this as demonstrating a limit to how quickly people can speak regardless of diagnosis and suggests that AWC speak at an accelerated rate under all conditions due to an internal drive to do so. Alm (2004; 2011) speculates that dysfunction in the basal ganglia's ability to produce accurate timing cues for speech results in dysfluency in adults who stutter (AWS) and may also explain the dysfluency seen in AWC. Van Zaalen et al (2009) also state that the difficulties seen in cluttering stem from 'defective language automation' along with articulation errors due to an accelerated speech rate. These speculations are yet to be supported by empirical data.

Myers and Bakker (2013) used the CSI (cluttering severity instrument) to investigate the speaking characteristics of AWC. Expert clinicians were asked to rate the saliency of; speech intelligibility, rate regularity, rate, articulation precision, normal dysfluency, language disorganisation, percentage sample duration cluttered, discourse management and prosody in samples of cluttered speech. It was found that intelligibility, rate regularity; rate, articulation precision and normal dysfluency were deemed to be the most salient characteristics. This is largely consistent with data presented by St Louis (1996). Myers and Bakker (2013) found excessive dysfluencies and overly rapid and irregular rate were the most often reported features of cluttered speech, followed by abnormal handwriting, and abnormal pragmatic abilities. Reduced intelligibility was deemed as the most salient factor overall which is consistent with typical AWC self-reports that listeners struggle to understand them. Of the characteristics deemed to be most salient, four appear within the LCD; however, the most salient, intelligibility, does not. This suggests experts believe that intelligibility is core to any measure of cluttering severity, despite intelligibility not being mentioned specifically in the LCD. Myers and Bakker (2013) also found strong correlations between i) rate regularity and percentage of talking time cluttered, ii) prosody and rate regularity, iii) normal dysfluency and rate, iv) discourse management and language disorganisation. The authors expected percentage of talking time cluttered to correlate more highly with more factors as it is intended to provide a 'global measure' of the severity of cluttering