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Predicting stuttering from phonetic complexity in German

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Abstract

This study investigated how phonetic complexity affects stuttering rate in German and how this changes developmentally. Phonetic difficulty was assessed using Jakielski's index [Motor Organization in the Acquisition of Consonant Clusters, Dissertation/Ph.D. Thesis, University of Texas Austin, 1998] of phonetic complexity (IPC) in which words are scored on eight different characteristics. Stuttering rate was not related to IPC score for German function words, as previously shown for Spanish and English. Significant correlations between stuttering rate and IPC score were found for content words for children over the age of six and adults. It was also found that German content words have a higher mean IPC sum compared to their English counterparts. There was a bigger difference in IPC score between fluent and stuttered words in German than in English. Factor 5 (word shape) influenced stuttering rates in both German age groups. This has also been found for Spanish but does not apply to English.

Educational objectives: The reader will be able to: (1) describe a method to measure phonetic complexity and how this affects stuttering rates for words of different grammatical classes; (2) explain why this method is suitable for different languages and age groups; (3) detect which phonetic characteristics have most impact on different age groups in English and German; (4) assess possible theoretical reasons for these findings.

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Stuttered events do not occur at random points in utterances. In particular, their position is constrained in part by the linguistic properties of the segments that make up the utterance. There is some variation across ages both in terms of the type of stuttering events that occur and where the different types of stuttering events are positioned relative to the linguistic units that give rise to them. The description of stuttered events, developed in work on adults, needs to be refined to reveal the relation of these events to the points where linguistic difficulty within an utterance is high and how this varies over age groups. [Johnson and co-workers' \(1959\)](#) list for characterising stuttered events in adult speech is used as a starting point. The events on this list are: (1) interjections of sounds, syllables, words and phrases; (2) word repetitions; (3) phrase repetitions; (4) part-word repetitions; (5) prolonged sounds; (6) broken words; (7) revisions; and (8) incomplete phrases.

It is difficult to specify what linguistic characteristic led to event types 7 and 8 and how many words these events affect, so they are often not included in stuttering assessments. [Howell, Au-Yeung, Sackin, Glenn, and Rustin \(1997\)](#) developed a parser for stuttered speech to remove them, leaving events of types 1–6. [Howell \(2004\)](#) has advocated that the first three categories should be grouped together (all involve hesitation or repetition of whole words, which are termed generically 'stalling disfluencies'). [Howell \(2004\)](#) also suggests that the remaining three categories should be grouped together as they involve breakdown within a word ('within-word stutterings').

One thing associated with the change in stuttering events over ages, is that whereas within-word stutterings occur most often on content words, stalling disfluencies occur on or around the phonetically simpler function words ([Howell, Au-Yeung, & Sackin, 1999](#)). Content words are nouns, main verbs, adjectives and adverbs that constitute an open class of words that expands as new words are added to a speaker's lexicon (see [Hartmann & Stork, 1972](#); [Quirk, Greenbaum, Leech, & Svartvik, 1985](#), for basic definitions). Function words are the remaining words (articles, pronouns, prepositions, conjunctions and auxiliary verbs) that are a closed class of words that is not added to once the grammar of a language has been established. A second observation, made by [Bloodstein \(2002\)](#), was that function words that are repeated by children, are often produced fluently as in the utterance 'his . . . his . . . his . . . strawberry.' These two facts suggest that it is unlikely that there is anything inherently wrong with preparation of the function word, so repetition or hesitation around them is not determined by difficulty in preparing these words for output. [Howell \(2002, 2004\)](#) suggests stalling delays the attempt at a subsequent content word (content words would be difficult to prepare as they are more likely to include phonetic structures with complex characteristics). Stuttering on content words, unlike stalling that involves whole function words, affects the initial parts of these words alone. This is consistent with the view that the content words are not completely prepared. [Howell's \(2002, 2004\) EXPLAN](#) theory maintains that the change from stalling to producing within-word stuttering, reflects a change from delaying before a content word to attempting the content word before the speaker is ready. EXPLAN regards the content word as the locus of difficulty at all ages though such difficulty precipitates different stuttering event types at different ages (stalling at an early age, within-word stuttering in adulthood).

Howell's taxonomy that separates stalling and within-word stutterings differentiates what [Wingate \(2002\)](#) considers to be true signs of stuttering (the within-word stutterings) from those events he would not consider to be characteristics of stuttering (the stalling disflu-

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