

Is speech fluency conditioned by syntactic complexity and/or prosodic factors? - A prosodic contribution to the understanding of stuttering in European Portuguese

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Silverman and Bernstein (1997) compared the fluency of stuttering and non-stuttering adolescents and concluded that syntactic complexity plays an important role in stuttering. Gordon and Luper (1989) believed that the relation between syntactic structure and fluency could vary according to the task proposed to speakers. In the same vein, Logan (2001) saw that speakers produce more disfluencies in spontaneous speech, thus showing that the frequency of stuttering events depends on the type of task: spontaneous or controlled speech. However, Bergmann (1986) following previous studies of stuttering from a phonetic perspective, suggested that stuttering is a prosodic disturbance. The import of prosodic factors is further explored in work by Bloodstein (1995) or Hubbard (1998), where the relevance of prosodic constituents and word stress is argued for.

Taking as background the research summarized above, the present work focuses on the importance of syntactic complexity and (prosodic) length on the fluency of stuttering adults, in European Portuguese (EP). Further explorations into the possible relevance of prosodic factors include the role played by the prosodic word domain (PW) and the locus of stuttering relative to prosodic structure in general (PW, phonological phrase (PhP) and intonational phrase (IntP)).

A *corpus* of controlled speech was designed, which includes (a) four types of syntactic complexity (as in (1)), (b) two different lengths (in terms of number of syllables) for each type (see an example in (1b)) and (c) a test to the prosodic word domain comprising both PW_{min} and PW_{max} structures (Vigário 2003), as in (2). The corpus contains thirty sentences that were read by two male adult speakers (a stuttering and a non stuttering speaker). Our analysis included the following measurements: (i) segmental or syllabic lengthening in stuttering and its prosodic distribution; (ii) duration and prosodic distribution of both filled and silent pauses (excluding breathing pauses); (iii) prosodic *locus* of stuttering (within the PW, the PhP and the IntP and relative to stress).

Our findings show that both syntactic complexity and prosodic length of phrases do not affect stuttering: segmental or syllabic lengthening occurs in similar patterns at every type of syntactic complexity and irrespective of the length of the phrase; the presence of a pause and/or its duration are also not constrained by syntactic complexity or phrase length. By contrast, the PW plays a determinant role in the distribution of stuttering events, as stuttering usually occurs at the beginning (first segment or syllable) of this prosodic domain. Moreover, both PW_{max} and PW_{min}-edges are relevant. The IntP is also shown to affect stuttering, as a higher frequency of stuttering events is found at PW-beginnings if the PW is the head of the IntP.

As Logan (2001) observed for American English, in EP syntactic complexity and phrase length do not trigger a higher frequency of stuttering events. The most relevant factors constraining stuttering emerge from prosodic structure and prosodic prominence.

- (1) a. Subject NP: Det + Adj + Adj + N
 b. Subject NP: Det + N + PP
 c. Subject NP: Det + N + Relative clause
 Length – Short: A turma que jogou saiu vencida.
the class that played got defeated
 Length – Long: A pequena que chorava muito feriu os braços.
the little-girl that cried a lot hurt her arms
 d. Object clitics: Det + N + PP + V + Clitic pronoun
- (2) O Tito é ((guarda)PW (nocturno)PW)PWmax. *the Tito is (a) night-watchman*

Selected References:

- Bergmann, Günther (1986). «Studies in stuttering as a prosodic disturbance». *Journal of Speech and Hearing Research*, Vol. 29, pp.290-300.
- Logan, Kenneth J. (2001). «The effect of syntactic complexity upon the speech fluency of adolescents and adults who stutter». *Journal of Fluency Disorders* 26, pp.85-106.
- Vigário, Marina (2003). *The Prosodic Word in European Portuguese*. Berlin & N.Y.: Mouton de Gruyter.