Assessing the consistency of disfluency measures in characterising speakers

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This paper presents further results from an ongoing programme of research investigation the potential use of disfluency measures in forensic speaker comparison.[1] At IAFPA 2012 and 2013 results of an investigation of individual differences in disfluency behaviour in the speech of 20 male speakers of Standard Southern British English from the DyViS database was presented. Disfluency features analysed included filled and silent pauses, repetitions, prolongations and self-imposed speech interruptions. Although the overarching hypothesis behind this work is that disfluencies might have a speaker-specific aspect to them, it is acknowledged that disfluency events are also related to other cognitive and behavioural phenomena such as speech planning, conversational management and prosody. Therefore disfluency, rather like fundamental frequency and speaking rate may be affected by the content and context of speech.

Speaker-specific patterns were observed in the types of disfluency features used and how often they used them. These patterns showed a degree of within-speaker consistency across the two speaking styles examined: a mock police interview and a telephone call with a friend. This suggests that, despite occurring in different contexts, the amount and type of disfluency behaviour may be relatively consistent within a given speaker.

While disfluency features appear to offer an additional source of individual information about a speaker, the degree of subjective judgement involved in their identification and categorisation may undermine the usefulness of this analysis. In the study described above, the disfluency features were transcribed and categorised by a single analyst. For the present study, a subset of the data (5 speakers, interview style) is reanalysed by two additional analysts and the results of the three analysts compared in order to evaluate the consistency of disfluency feature measurements across analysts.

The two new analysts undertook training with the first analyst to become familiar with the criteria for identifying each disfluency feature type and the system for coding them. At a subsequent meeting, the analysts discussed their experiences of using the categorisation system and jointly decided on revised criteria for the identification of features which had proved ambiguous or problematic. Each analyst then worked independently on refining his or her own coding record using the improved categorisation criteria. The three final sets of disfluency measurements will be compared to assess the inter-analyst consistency of the method and implications of the findings for forensic casework will be discussed.

Preliminary results comparing measurements made by two of the analysts indicate high levels of inter-analyst correspondence for filled pause categories, silent pause categories, repetition categories and self-interruption categories. Some other categories were problematic however

and we surmise that they may be less perceptually salient than others and/or pose a particular cognitive load in their identification. We will discuss how features may be defined in order to improve the consistency with which they may be identified.

References

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