Cross-linguistic issues in speech production disorders: spasmodic dysphonia in French-speaking subjects

MARJORIE PERLMAN LORCH*
RENATA WHURR**

*Applied Linguistics, Birkbeck College, University of London
**National Hospital of Neurology and Neurosurgery (UK)

INTRODUCTION

Spasmodic Dysphonia (SD) is a laryngeal pathology which is characterized by strained-strangled, effortful phonation punctuated by voicing arrest due to hyperadduction of the vocal folds at onset and during phonation (Zwirner et al. 1991). Investigations of this vocal pathology have been carried out predominantly on English-speaking patients. The present study represents an effort to rectify this Anglocentric bias by addressing the question: How do language-specific features interact with this laryngeal disorder as manifested in SD speakers? The focus of this cross-linguistic investigation is French where voicing and pitch are employed in a linguistically distinct manner from English.

METHOD

Naturalistic speech samples from videotaped interviews of six French SD speakers were used. The interviews were semi-structured conversations. In order to control for the variability in the amount of speech produced by different subjects in response to the examiner's questions, a corpus of 100 syllables was created for each subject with narrow phonetic transcriptions. These representative speech samples were analysed with regard to the pathological phonetic features of SD speech and the linguistic environments in which they occurred.

SD features as identified in English – pitch breaks, phonatory breaks, and the vocal qualities of falsetto, harshness and whispery voice were analysed in the French SD samples. The phonetic environment was analysed in detail in order to determine how particular linguistic contexts may trigger pathological productions.

ANALYSIS

Of the linguistic features analysed, voice breaks, which are one of the hallmarks of SD in English speakers, were entirely absent from all speech samples of SD French speakers. This is a surprising finding. With the limitations of the data being analysed here it is not possible to determine conclusively where this can be attributed to language-specific factors or is simply an artefact of the particular circumstances of these speech samples.

Of the consonant clusters produced, 58% contained voice breaks. Voice breaks also occurred in 64% of environments containing a Consonant + Semi-consonant.

The nasal vowels were found to provide an environment which was correlated with the feature harshness to a fairly large degree, and the open vowels were perceived to be produced more harshly than the closed vowels. French open-mid and open vowels (including the nasal vowels) represent 45% of the vowels used in conversational speech, while the English open-mid and open vowels represent only 25% of the vowels used. Therefore, because open vowels are more affected by harshness than closed ones, and English has a phoneme inventory which is comprised of 27 consonants and 13 vowels with a C/V ratio of 2.08. French has a phoneme inventory which is comprised of 21 consonants and 16 vowels with a C/V ratio of 1.31. This comparison suggests that as vowels are proportionally more frequent in French than in English syllables, and as harshness is noted to affect vowels, a French SD speaker will have a potentially greater problem with harshness than an English SD speaker. On the other hand, French has higher sonority than English and therefore provides a greater potential for harshness than English, both of these languages have greater sonority than is typically the case.

Harshness was found predominantly in open and nasal vowels with phonatory breaks found predominantly in consonant clusters. Consonant clusters are more frequent and more complex in English than French, while open vowels are almost twice as frequent in French than English. This suggests that French SD speakers' speech is harsher but contains relatively fewer phonatory breaks than English SD speakers due to the language specific differences in the phonetic environments the two languages possess.

In French, each individual sound is clearly articulated, there is no reduction in unstressed syllables as is the rule in English. As the SD features can alter sounds through production of vowels affected by whisper and the devoicing of consonants it would seem that the intelligibility may be affected more in French than in English.

These various points taken together suggest that although SD does not affect articulation in any major sense the vocal pathology does indirectly have a great impact on intelligibility.

In conclusion, of the linguistic features analysed, harshness was found predominantly in open and nasal vowels, while phonatory breaks were found predominantly in consonant clusters and pitch breaks were absent in these corpora. Consonant clusters are more frequent and more complex in English than French, while open vowels are almost twice as frequent in French than English. This suggests that French SD speakers' speech is harsher but contains relatively fewer phonatory breaks than English SD speakers due to the language specific differences in the phonetic environments of the two languages.

ACKNOWLEDGMENT

The authors wish to acknowledge the invaluable contribution of Marie Ploquin who was instrumental in the phonetic transcription and analysis. This research was carried out with the support of funding from Birkbeck College to the first author.

REFERENCES

Zwirner, P.; Murry, T.; Swenson, M.; Woodson, G. 1991. Functional Assessment of Patients with spasmodic Dysphonia. *Journal of Voice, 5*, 78-84.