

Laryngealization as a Boundary Cue in Read Speech

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The function of laryngealization as a potential boundary cue at sentence, paragraph, and turn junctures has been noted by several researchers [1],[2],[4],[5]. In these studies, laryngealization is mostly treated as an either-or-phenomenon that occurs as a complementary feature together with other, more prominent boundary cues (pause, pre-boundary lengthening, phonological blocking, non-level intonation) to mark an extra degree of horizontal break. No differentiation between kinds of laryngealization has been suggested in the literature, and related terms such as creak, creaky voice, glottal fry, and glottalization are usually employed indiscriminately and in an synonymous way.

In a study of text intonation in Swedish [3] four different patterns of laryngealization were observed to occur consistently at different kinds of junctures. These patterns are exemplified in figure 1, and will be denoted in the following as *creaky voice*, *creak*, *diplophonic phonation*, and *glottalization*.

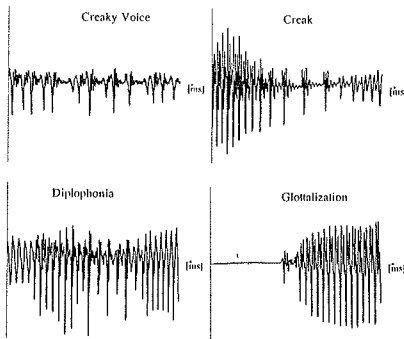


Figure 1 Patterns of laryngealization in the reading of coherent texts by four Swedish subjects.

Creaky voice and creak occurred predominantly at pre-boundary (utterance final), and glottalization exclusively at post-boundary (utterance initial) locations. Diplophonic phonation, i.e. alternations between strong and weak glottal excitations, were observed both at utterance internal and utterance final junctures.

Although each of the four speakers participating in this study (2 female, 2 male; 2 radio journalists, 2 experienced public speakers) used each of the four modes of laryngealization at

some time or another during the text reading sessions (3 texts: 1 narrative, 1 descriptive, 1 argumentative; comprising a total of 2610 running words), there are clear indications in our data for some kind of preference patterning both with respect to speaker variability and kind of boundary.

Inter-speaker variability

It appears from these data (1) that both female speakers make more frequent use of laryngealization as a boundary marker than their male counterparts, and (2) that creak and diplophonic phonation are the two modes that were preferred by our female subjects, while the two men (in as much as they use laryngealization at all) apparently prefer creaky voice. The use of glottalization at post-boundary positions does not appear to differ significantly between our male and female speakers.

Boundary locations

The correlations of different patterns of laryngealization with different kinds (and/or degrees) of textual, sentential and prosodic junctures (paragraph, sentence, clause, phrase, constituent, intonation unit, declination resetting, speech inhalation pause) indicate the following general tendencies:

Creak appears to be closely associated with intonation unit boundaries that are not marked by a low terminal F_0 contour.

Creaky voice was found predominantly at intonation unit offsets with a low terminal F_0 contour.

Diplophonic phonation occurred either at intonation unit offsets with a low terminal F_0 contour (female), or in utterance internal positions at word junctures between adjacent voiced (mostly vowel) sounds. At intonation offset locations, diplophonic phonation occurred together with other vocal features (e.g. breathiness) or in the transition before a period of aperiodicity and/or devoicing.

Glottalization was most often used to mark sentence internal clause boundaries, irrespective of whether they coincided with the onset of a new intonation unit or not.

It thus appears that creaky voice, creak and glottalization serve as genuine boundary cues, the use of which varies between different speakers. Diplophonic phonation, on the other hand, occurs predominantly in our material as a transition phenomenon between adjacent

coarticulated voiced speech sounds and might thus be a consequence of source-tract interaction rather than an independently controlled laryngeal gesture used as a boundary cue.

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