Individual differences in the production of prosodic boundaries in American English

Jiseung Kim
University of Michigan
jiseungk@umich.edu

Phonological contrast is typically realized through multiple phonetic characteristics. There has been growing interest in how individual language users weight these properties in production and perception at the segmental level. However, despite noticeable individual variation in the production of prosodic boundaries (e.g., Fougeron & Keating, 1997; Byrd et al., 2006; Mo & Cole, 2010), a systematic examination of it has not yet been conducted. The goal of this study is to delineate individual differences in the production of a major prosodic boundary (Intonational Phrase; IP) in American English, in order to understand how such variation is accommodated in the representation of prosodic structure.

The Autosegmental Metrical (AM) theory (Pierrehumbert, 1980; Beckman & Pierrehumbert, 1986) distinguishes prosodic phrases at different levels, and a number of acoustic properties are associated with these. For example, the IP of American English is primarily associated with silent pause, phrase-final lengthening, and tonal properties (boundary tone) (Wightman et al., 1992; Swerts, 1997). The present study examined whether and to what extent these properties are manifested in the production of IP boundaries.

Sixteen sentence pairs differing in type of prosodic boundary (word and IP boundary) were constructed. In the example below, the acoustic properties associated with the IP boundary would be present after ‘my mommy’ in (b) but after ‘Belini’ in (a). Phrase-final lengthening, pause duration, and pitch reset at the boundaries of 4,608 utterances were analyzed (16 sentence pairs × 9 repetitions × 32 speakers). Target words include real words (mommy, nanny) and novel names (Mamima, Nanina).

(a) The doctor called my mommy # Belini. And Jasmine said nothing's wrong. (# denotes word boundary)
(b) The doctor called my mommy. # Belini and Jasmine said nothing's wrong. (# denotes IP boundary)

The main hypothesis is that individual speakers will show substantial variation in the phonetic features used and in the degree to which they were used to express the IP boundary. Generalized Linear Mixed Model results showed that presence of an IP boundary was systematically predicted by final lengthening and pitch reset. Within-subject analyses, however, revealed that speakers varied in how they used these properties to distinguish the word boundary from the IP boundary. While most speakers used final lengthening to mark boundaries, they differed in the degree of final lengthening. The tonal properties analyzed in the form of pitch reset were also not used by all speakers to a comparable extent. In addition, the duration of pauses between two IPs differed across speakers. Data from two speakers illustrate these differences. Speaker 21 used all three properties to produce the IP boundary, while speaker 31 mostly relied on pitch reset and pause. Analyses are currently under way to evaluate individual differences in the pattern of lengthening of the boundary-adjacent segments. We will discuss the implications of individual variation in the production of different prosodic categories for models of prosody, specifically the two dominant approaches to prosodic theory – i.e., AM and Articulatory Phonology (Byrd & Saltzman, 2003; Katsika et al., 2014).
References