

Korean speech rhythm using rhythmic measures

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This paper investigates speech rhythm in standard Seoul Korean using recently developed durational rhythmic measures. Traditionally, languages are classified into ‘stress-timed’ and ‘syllable-timed’ (Abercrombie, 1967), with English and German being typical stress-timed languages, French and Italian typical syllable-timed languages. Later works suggested a third category of mora-timed languages, in which Japanese is a typical example (Port, Dalby & O’Dell, 1987). Speech rhythm derives from the perception of repetition of similar elements, which was attributed to the isochronous units with near-equal durations in speech: stress-related feet, syllables or morae. However, no experimental evidence for such isochronous intervals was found to support a rhythmic typology of languages (e.g. see Grabe & Low, 2002 for a review). Recently, several durational rhythmic measures based on the acoustic speech signal were developed: %V, ΔC , ΔV by Ramus et al. (1999); normalised and raw PVIs by Grabe & Low (2002); VarcoV and VarcoC by Dellwo (2006). Such measures take only consonant and vowel durations as the basis for rhythmic classifications. They could classify languages according to their traditional rhythmic groupings, with %V showing the most robust classifications (White & Mattys, 2007).

The speech rhythm of Korean is controversial, and only very little work was done to investigate Korean speech rhythm using durational rhythmic measures. Both syllable-timing and stress-timing were proposed (e.g. Han 1964 and Ji 1993). Seong (1995) argued that Korean cannot be categorised as either stress-timed or syllable-timed because Korean possesses characteristics of both types of languages, while perceptual studies showed that Korean is similar to Japanese in many aspects, suggesting that Korean may be one of the mora-timed languages (Bond & Stockmal, 2002; Cho, 2004).

The present study investigates Korean speech rhythm using the abovementioned acoustic rhythmic measures with three types of duration (syllabic, consonantal and vocalic), and compares it with Cantonese (Can), Beijing Mandarin (Man), French, Italian (syllable-timed languages) versus English and German (stress-timed languages) (Mok & Dellwo, to appear). Six native speakers of standard Seoul Korean (three male and three female, with an average age of 25)

were recorded reading a colloquial version of the North Wind and the Sun story with a normal speech rate (_n), and telling the story themselves semi-spontaneously (_t). All sound files were labelled manually into syllabic (S), consonantal (C) and vocalic (V) intervals using Praat and were cross-checked by both authors. Segmentation criteria follow those in Grabe & Low (2002).

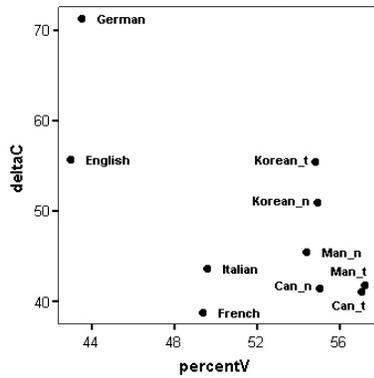


Figure 1. %V and ΔC of all languages.

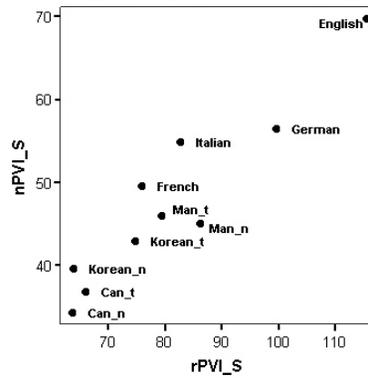


Figure 2. Raw and normalised syllabic PVI of all languages.

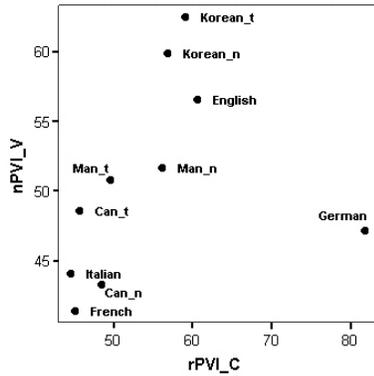


Figure 3. Raw consonantal PVI and normalised vocalic PVI of all languages

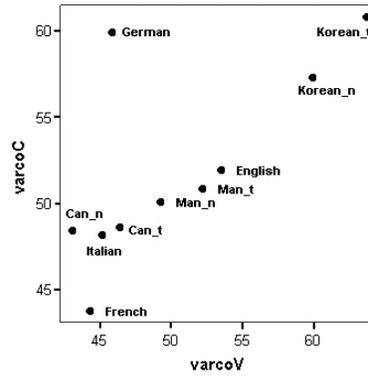


Figure 4. VarcoV and VarcoC of all languages

Results show that the durational rhythmic measures gave a mixed picture of Korean speech rhythm. The parameter of %V classifies Korean as syllable-timed, although for ΔC , Korean lies between syllable-timed and stress-timed

languages (Figure 1). Korean also clusters with syllable-timed languages using both raw and normalised PVIs with syllabic durations (Figure 2). However, raw consonantal PVI and normalised vocalic PVI, as suggested by Grabe & Low (2002), classify the languages less clearly (Figure 3). The normalised parameters of VarcoX also did not yield distinct rhythmic groupings (Figure 4).

It is likely that the simple syllable structure in Korean contributes to the impression of syllable-timing, while the frequent occurrence of taps and strong final lengthening make Korean more similar to stress-timed languages durationally. These features contribute to the mixed pattern of Korean speech rhythm as defined by various durational rhythmic measures, echoing Seong (1995). Based on the results of %V and syllabic PVIs which show distinct rhythmic clusters, Korean is closer to syllable-timing than stress-timing.

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