No effects of f0 manipulation and phrase position in Korean word recognition
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Studies have shown that the f0 shape of words facilitates their recognition (e.g., Laures & Wiesmer, 1999; Hillenbrand, 2003). This effect has been observed mainly for pitch accent languages, such as English, in which the f0 shape of an accent generally aligns with the word stress pattern (e.g. Cutler and Foss, 1977; Cutler, 2012). Less is known about the role of f0 in word recognition in languages without pitch accents and/or word stress. The main question is whether f0 facilitates word recognition at all in these languages, as this cue might solely operate on the phrase level, such as the intonational, intermediate or accentual phrase (IP/ip/AP). The current study extends earlier work that investigated the role of f0 and phrase position in Papuan Malay and American English (Kaland & Gordon, 2022).

We investigate Korean, which mainly uses prosody to mark phrase edges and does not have word stress (an ‘edge language’ in Jun, 2014). Previous work has shown that Korean words often form an AP and that the AP-final rise facilitates listeners’ word segmentation (Kim, 2004). It was also found that final lengthening is a helpful cue only to a limited extent (Kim & Cho, 2009). If the functions of Korean prosody are indeed restricted to phrase edges, the question remains whether f0 shape interacts with position in the phrase in this language and whether these factors facilitate word recognition.

A forced choice word identification task was carried out, in which listeners decided as fast as possible which of two written words (target and distractor) occurred in the auditorily presented carrier phrase (replication of Kaland & Gordon, 2022). Targets and distractors were disyllabic and had overlapping initial segments. Thus, there was a uniqueness point (UP) from which the target could be uniquely identified. Targets had an original f0 or a flattened (manipulated) f0, positioned either medially (1) or finally (2) in the utterance.

1) 네가 말한 그 단어 나비는, 나는 모르겠어
ni-ga mal.hanku tan.ʌ [ T ]-neun, na-nun mo.lu.ke.sa
you-NOM mention the word [ T ]-TOP, I-TOP don’t know
‘The word [ T ] you mentioned, I don’t know.’

2) 나는 모르겠어, 네가 말한 그 단어 나비.
na-nun mo.lu.ke.sa, ni-ga mal.hanku tan.ʌ [T]
I-TOP don’t know, you-NOM mention the word [T]
‘I don’t know the word [ T ] (you mentioned).’

The results show that Korean listeners were not affected by f0 shape or position (Figure 1, Table 1). Thus, participants took similar time to identify a target when it was presented with original or manipulated f0, and whether it occurred in medial or final position. This seems to indicate that f0 does not operate at the word level, which refines the results for the accentual phrase in word segmentation (Kim, 2004) and confirms the analysis of Korean as an edge language (Jun, 2014) and the analyses of Papuan Malay and American English as head/edge language (tentatively) and head language respectively (Kaland & Gordon, 2022). The results also seem to indicate that listeners did not benefit from final lengthening at the end of the carrier phrase, unlike listeners of head(ge) languages (cf. Kaland & Gordon, 2022). It is not the case, however, that final lengthening did not occur on the Korean disyllabic target words (i.e., medial: 286 ms, final: 358 ms). The lack of phrase position effect could be explained when considering the status of the particle ‘-neun’ (는). When this particle is analyzed as being part of the target word (which would be justified morphologically), the medial target words are approximately 240 ms longer (526 ms). In addition, Korean phrasing required a pause after the medial target. Thus, participants had at least as much time to process the medial targets than the final targets, which most likely counterbalanced any facilitative effect of final lengthening in the current stimulus set. In sum, the results lend further support for a prosodic analysis of Korean in which f0 operates solely on the phrase level (e.g., Kim, 2004).
Figure 1. Log reaction times (logRT) to word identification from the uniqueness point (UP) in the target word, split for f0 manipulation (original, flat) and position (medial, final).

Table 1. Summary of the main fixed factors in the linear mixed effects model, factors not listed did not show a significant effect.

\[
\text{logRT from UP} \sim f0 \text{ manipulation} \times \text{position} + \text{no. of segments before UP} + \text{stimulus order} + (1|\text{item}) + (1|\text{participant})
\]

<table>
<thead>
<tr>
<th>Factor</th>
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<td>(Intercept)</td>
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References