

# Native and Non-Native English Speakers' Use of Prosody to Anticipate Sentence Endings

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## 1. Introduction

Spoken communication requires online anticipation of upcoming information in order to maintain effective discourse. There are a number of prosodic cues including the intonational contour and phrase final lengthening [1] that provides indicators as to how long a sentence will be. While it has been shown that native speakers of English (L1) are sensitive to this prosodic information, and are able to anticipate a sentence ending several syllables early [2], there is evidence that non-native speakers (L2) are less attuned to speech timing cues [3] and perform poorer on determining a sentences end than native speakers [4]. In this study, we used a gating paradigm to compare L1 and L2 speakers in how accurately they can anticipate a sentence ending.

## 2. Method

### 2.1 Participants

Twenty native Australian English speakers (L1;  $M_{age}=21$ ), and 20 native Vietnamese speakers (L2;  $M_{age}=24$ ) participated. The native Vietnamese speakers scored at, or above, the LexTALE English proficiency test [5] advanced learner threshold of 70.7% ( $M=83.36\%$ ).

### 2.2 Stimuli

Thirty-three different English sentences, which followed an identical grammatical structure consistent with [2], and 11 different filler sentences were created. Sentences were created in increasing length, for example:

- (A) On Monday the worker fixed the lock.
- (B) On Monday the worker fixed the lock on the door.
- (C) On Monday the worker fixed the lock on the door of his car.

These were spliced at the first object noun (i.e., 'lock') producing three conditions whereby the sentence might continue: (A) zero words, (B) three more words, or (C) six more words. Sentences were then gated at eight points, producing sentence fragments, which were presented in lengths of increasing duration.

Conditions were counter-balanced and pseudorandomised across three versions of the 44 sentences, and these versions were randomly allocated across participants.

### 2.3 Procedure

Sentence fragments were presented using E-prime software on a laptop. Once fitted with headphones and seated in a quiet room, participants were instructed to press space bar to play each sentence fragment and then decide whether it came from sentence (A), (B), or (C), and rate their level of confidence in their decision on a Likert scale (1-4). Participants were given self-paced practice and experimental items, which took approximately 50 minutes to complete. Finally, a feedback questionnaire was completed which asked participants about task difficulty and strategies used.

## 3. Results and Conclusions

There was no significant difference between groups on accuracy of responses,  $\beta=.001$ ,  $p=.99$ , or on confidence ratings,  $\beta=.17$ ,  $p=.42$ . There was a significant interaction between Condition and Gate for accuracy, such that the likelihood of accuracy increased faster for Sentence A vs B,  $\beta=.11$ ,  $p<.001$ , and C,  $\beta=.05$ ,  $p=.03$ . Confidence ratings for both groups steadily increased from Gate 1 through to Gate 8.

Contrary to our expectations, L1 and L2 speakers performed similarly in their ability to anticipate sentence ending in this task. This may be due to the L2 speaker's high English proficiency, but also due to the L1 speakers poorer performance than in previous studies (e.g. [2]), as it was not until the penultimate gate that participants were reliably differentiating between the sentences. Given that Australian English is one of the dialects known for high rising terminal intonation, listeners may less reliably rely on prosodic cues to juncture in sentence processing.

## 4. References

- [1] D.L.Bolinger, "Intonation across languages", in J. H.Greenberg (Ed.), *Universals of human language*, *Phonology*, Vol. 2, Stanford, CA: University Press, 1978, pp.471-524.
- [2] F. Grosjean and C. Hirt, "Using prosody to predict the end of sentences in English and French: normal and brain-damaged subjects", *Language and Cognitive Processes*, Vol. 11, 1996, pp. 107-134.
- [3] M. Baese-Berk, T. Morrill, and L. Dille, "Do non-native speakers use context speaking rate in spoken word recognition?", presented at Speech Prosody 2016 Conf., Boston, U.S. 2016.
- [4] M. O'Brien, C. Jackson, and A. Hendricks, "Making use of cues to sentence length in L1 and L2 German". *Linguistic Approaches to Bilingualism*, Vol. 3, 2013, pp. 448-477.
- [5] Lexical Test for Advanced Learners website. Viewed 2016, June 15. Accessed from <http://www.lextale.com/>