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**Learning questions in an L2: Koreans learning English question intonation**

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## Abstract

Remnants of a speaker's first language (L1) are often present on features of their second language (L2). This paper investigates how native speakers of Korean acquire English intonational patterns on *wh*-questions and *yes/no* questions. English and Korean intonational structures differ on numerous levels. In addition to different intonational structures, English and Korean also differ as to how they distinguish between *yes/no* and *wh*-questions. In Korean, *yes/no* and *wh*-questions are syntactically the same. The only way in which they differ is in their intonational phrasing. In English, *yes/no* and *wh*-questions differ in multiple ways: choice of lexical item, syntactically, and intonationally.

I will present preliminary experimental data from native speakers of Korean who are at various stages of acquiring English. I will also compare the intonational patterns to those of native English speakers and Korean L1 speakers. My preliminary results show that two of the native Korean participants do not seem to be aware of English intonational patterns, while the third (more advanced) speaker shows native-like intonational patterns in some English questions.

## 1. Introduction

Remnants of speakers' first language (L1) are often present on both the segmental and supra-segmental (prosodic) features of their second language (L2). Numerous studies focus on the L2 acquisition of segmental features (Flege 1987; 1995, among others), but few studies focus on the L2 acquisition of prosody (but see Ueyama & Jun 1985). This topic is interesting because to date there has not been a large amount of research done on the L2 acquisition of Intonational patterns, yet this remains an area of acquisition which poses problems for most (if not all) second language learners. As Cruz-Ferreira (1989:24) points out, intonation is "the last stronghold of a foreign accent in speaking any L2" asserting that the observation is true "even of speakers who otherwise have perfect or near-perfect command of the phonetics of the L2."

In this paper I address at how native speakers of Korean acquire English Intonational patterns on two types of questions: *wh*-questions and *yes/no* questions. The analysis presented in this paper is based on a pilot experimental research study which looks at native speakers of Korean who are at varying stages of acquiring English. The specific research questions that I address in this paper are the following:

- i. Does the L1 intonation system affect L2 intonation patterns?
- ii. If the L1 intonation system does affect L2 intonation patterns, to what extent?
- iii. Does a higher level of proficiency in the second language improve L2 intonation?

### *1.1 Overview of the Paper*

Section 2 overviews the English and Korean intonational models which I adopt for this paper. Section 3 addresses the intonational structures of *yes/no* and *wh*-questions in both English and Korean. In Section 4, I briefly highlight some theories of second language acquisition and what predictions and hypotheses I can propose for this current study. Section 5 will discuss the experimental design of my study and the analysis of results will be provided in Section 6. The final section, Section 7, will provide a conclusion to my paper as well as a section on directions for future research in this area.

## 2. Intonational Models

### *2.1 Intonational Phonology in English*

This section focuses on the intonational structure of English which was developed by Beckman & Pierrehumbert (1986). Under this model, intonation contours are analyzed as sequences of high (H) and low (L) tones. These tones are categorized as one of three types: pitch accents, phrasal tones, and boundary tones. The pitch accent (PA) is associated with the stressed syllable of a phrase and this stressed syllable receives pitch prominence. According to Beckman & Pierrehumbert (1986) English has 6 types of PA. These are shown in Table 1 below.

Pitch Accent	Description
H*	= peak accent; default accent
L*	= low accent
L*+H	= scooped accent
L+H*	= rising peak accent
H*+L	= fall from peak accent
H+L*	= fall onto a low accent

Table 1: Six Types of English Pitch Accents. *Source: Pierrehumbert & Hirschberg (1990)*

In addition to PAs, English also has boundary tones which mark the end of an intonational phrase (IP) and phrasal tones which cover the space between the last pitch accent and the boundary tone. In English there are two types of phrasal tones (L-, H-) and two types of boundary tones (L%, H%). In this model (illustrated in Figure 1), the PA, phrasal tone, and boundary tone are hierarchically organized into a type of prosodic hierarchy. IPs must have at least one PA (but they may have more than that). Under this model Phonological Phrases (PPs) can have more than one PA. When this occurs, the last PA is generally the most prominent and is labeled as the nuclear PA.

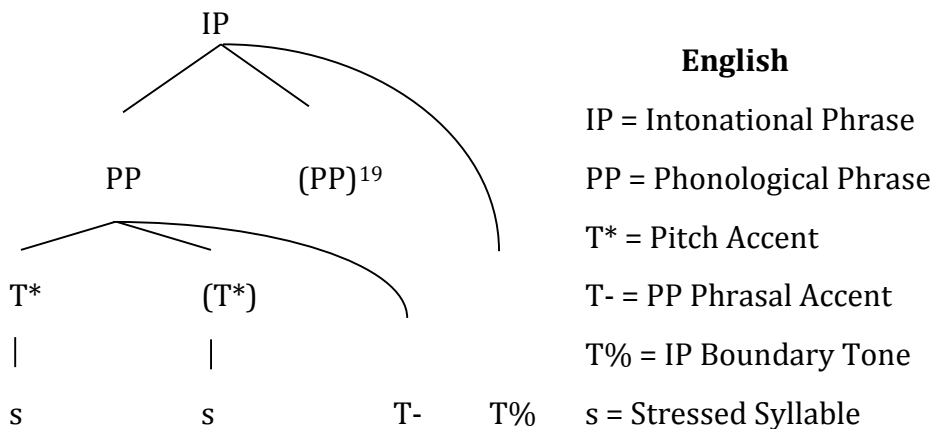


Figure 1: Intonation structure of English

## 2.2 Intonational Phonology in Korean

This section focuses on the intonational structure of Korean and adopts the model of Korean prosody developed by Jun (1993; 2005) which was built off of the model proposed for English by Beckman & Pierrehumbert (1986).

<sup>19</sup> Brackets denote an optional segment

In this model, Jun proposes two prosodic units which are higher than a phonological word: an accentual phrase (AP) and an IP. According to Jun, an AP can have more than one phonological word and it is marked by a phrase final rising tone (in the Seoul dialect of Korean). An IP can have more than one AP and is marked by a boundary tone and a phrase final lengthening. In the prosodic hierarchy, the AP is higher than a prosodic word and lower than the IP.<sup>20</sup> The AP is found where, in many languages, we would find a PP, but these two phrases differ: The accentual phrases' formation is based on the intonational pattern of an utterance rather than on the syntactic structure of a sentence.

The tonal pattern of the Accentual Phrase for the standard Seoul dialect of Korean is L-H-L-H<sup>21</sup> (Jun 1993; 2005). The first tone is realized on the first syllable of the phrase, followed by the second High tone on the second syllable, the Low tone on the third syllable, and the High tone on the final syllable of the phrase. The Korean Accentual Phrase tones can also change depending on the size of the word (see Figure 2).

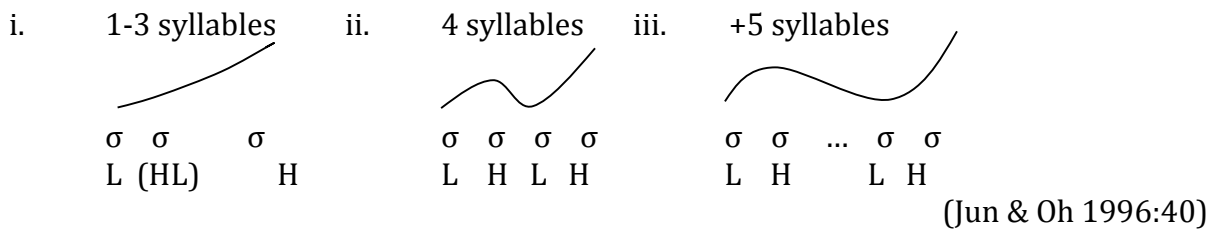


Figure 2: Tonal realizations of an AP in a Seoul dialect of Korean

When an AP is the last AP in an IP then the AP-final H tone is overridden by an IP boundary tone. The intonational structure of Korean is illustrated in Figure 3 below.

<sup>20</sup> Jun (1993; 1998) does not propose a PP, but proposes that the AP is found at the same level as the PP would be under the Prosodic Hierarchy Theory developed by Selkirk (1986) and Nespor & Vogel (1986).

<sup>21</sup> This pattern can change to High-High-Low-High if the phrase initial segment is an aspirated or tense obstruent.

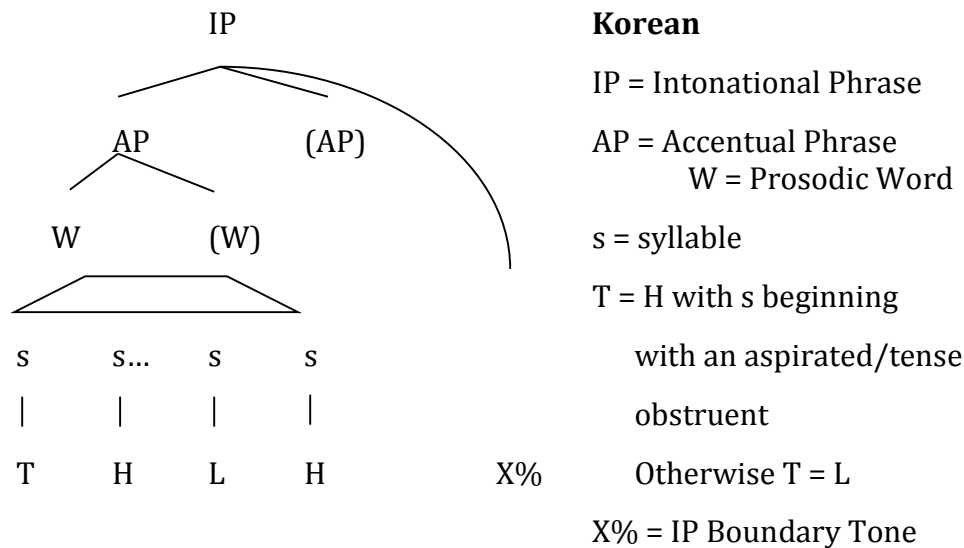


Figure 3: Intonation structure of Korean

### 2.3 A Comparison of Korean and English Intonation Systems

The English and Korean intonational structures differ on numerous levels. English marks PAs, PPs, and IPs while Korean is a language which has neither lexical stress nor lexical pitch accent (Jun 2003). In Korean, there are no PAs or PPs, rather APs. Therefore, the F0 contour of the English IP is determined by pitch accents which are linked to stressed syllables while in Korean it is determined by a series of AP tones. The Korean AP phrasal tones change depending on the size of the word, but the size of an English word does not influence the English pitch accents. The differences between the Korean and English intonational systems are summarized in Table 2 below.

English	Korean
<ul style="list-style-type: none"> <li>marks Pitch Accents, Phonological Phrases, and Intonational Phrases</li> </ul>	<ul style="list-style-type: none"> <li>no Pitch Accents or Phonological Phrases</li> <li>Marks Accentual Phrases, and Intonational Phrases</li> </ul>
<ul style="list-style-type: none"> <li>F0 contour of the Intonational Phrase is determined by Pitch Accents linked to stressed syllables</li> </ul>	<ul style="list-style-type: none"> <li>F0 contour of the Intonational Phrase is determined by a series of Accentual Phrase tones</li> </ul>
<ul style="list-style-type: none"> <li>size of the word does not influence English Pitch Accents</li> </ul>	<ul style="list-style-type: none"> <li>Accentual Phrase tones change depending on the size of the word</li> </ul>

Table 2: Comparison of English and Korean intonation systems

### 3. Question Formation

In addition to different intonational structures, English and Korean also differ in how they distinguish between *yes/no* and *wh*-questions. This section provides an overview of these

two types of question formation in both English and Korean. Section 3.1 focuses on English question formation and intonation while Section 3.2 highlights Korean question formation and intonational patterns. Section 3.3 provides a comparison of Korean and English question formation and intonation.

### 3.1 English Question Formation

The two types of questions that I discuss in this paper are *yes/no*-questions and *wh*-questions. *Yes/no*-questions are intended to elicit a response of either *yes* or *no*. They are usually formed by using the word order of verb, subject, object and they have a sentence-final rise in pitch.<sup>22</sup> If we look at Figure 4 below, we can see that in the *yes/no*-question “Are we eating anything?” there is a final rising intonation (H-H%) with a low pitch accent on ‘anything’.

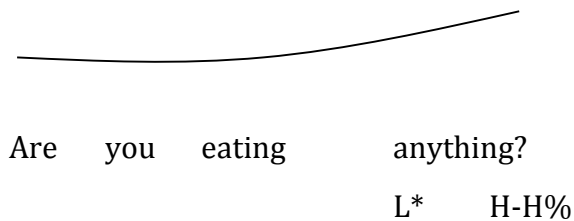


Figure 4: Intonational structure for *yes/no*-question *Are we eating anything?*

*Wh*-questions (questions that contain words such as *who*, *what*, *when*, *where*, *why*, or *how*) have a different intonational pattern from *yes/no* questions. They generally do not have rising intonation as we saw for *yes/no* questions; instead, they have a main pitch accent on the verb (in my example, *eat* of *EATing*) followed by falling intonation. This is shown in figure 5.

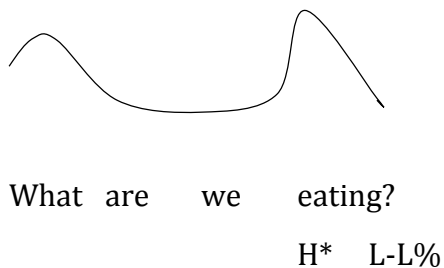


Figure 5: Intonational structure for the *wh*-question “What are we eating?”

<sup>22</sup> Couper-Kuhlen (2012) points out that while *yes/no*-questions often have rising intonation and *wh*-questions often have falling intonation there are numerous exceptions (i.e., repeat questions where certain elements are focused for clarification, or tag questions). While I am aware of these types of questions, they are excluded from the data used in this study.

### 3.2 Korean Question Formation

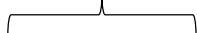

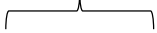
In Korean, *wh*-questions and *yes/no*-questions are syntactically ambiguous, as we see in 1. Syntactically, 1a and 1b have identical surface forms, but 1a has a *yes/no* reading and 1b has a *wh*-question reading. These two syntactically ambiguous readings are disambiguated by use of prosodic features.

- (1) nuka wa-jo  
 who/anyone come-HON.INTER  
 a. Is anyone coming? (*yes/no*-question)  
 b. Who is coming? (*wh*-question)

(Jun & Oh 1996:60)

*Wh*-words have two functions in Korean: Either they serve as a *wh*-pronoun as in a *wh*-question or they function as an indefinite pronoun in a *yes/no*-question. For example, the Korean word *nuka* can either have the interpretation ‘who’ or ‘anyone’. This ambiguity is differentiated by prosodic features such as boundary tones, or high versus low pitch.

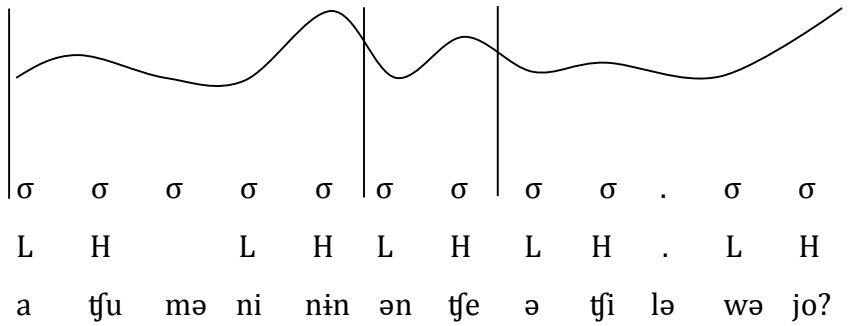
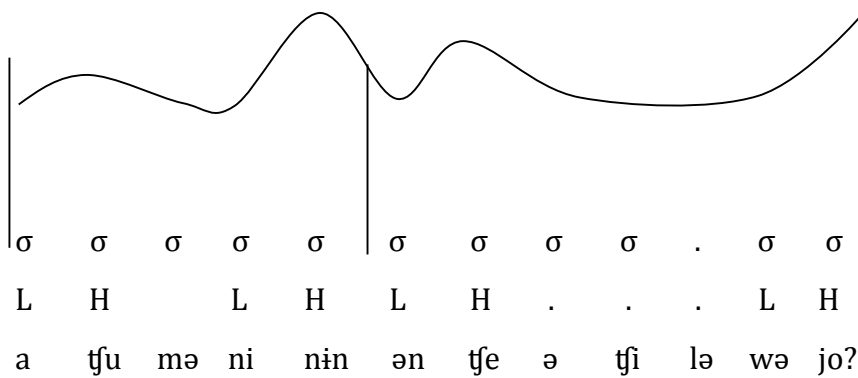
In their 1996 study, Jun & Oh (48) show that in their Korean stimuli Korean *yes/no*-questions show three accentual phrases (a pre-*wh*-phrase, the *wh*-word, and the VP) and *wh*-questions show two (a pre-*wh*-phrase, and the *wh*-phrase: *wh*-word and VP). An example with a pre-*wh*-phrase is shown in 2.<sup>23</sup>

- |     |   |   |  |
|-----|---|---|--|
|     | pre- <i>wh</i> -phrase  | wh-word   | VP   |
|     |  |  |  |
| (2) | atʃuməni-nin<br>madam-TOP   | əntʃe<br>anytime/when   | ətʃiləwə-jo<br>dizzy-HON.INTERR  |
|     | a. Is there any time when you feel dizzy, madam? ( <i>yes/no</i> -question)         |   |  |
|     | b. When do you feel dizzy, madam? ( <i>wh</i> -question)                            |   |  |

This sentence is further illustrated in 6a and 6b with a schematic representation of F0 contours of *wh*-phrase is shown for Korean *yes/no* questions (2a) compared to *wh*-questions (2b). The vertical line marks the AP boundary. We can see in 2a that there are three APs: the pre-*wh*-phrase, the *wh*-indefinite, and the verb while in 2b there are only two APs: the pre-*wh*-phrase and the *wh*-phrase.

<sup>23</sup> According to Jun & Oh (1996: 41) an adverbial noun phrase (pre-*wh*-phrase) was added to their stimuli before the *wh*-phrase to see if there is a pitch range difference outside of the *wh*-phrase depending on the question type.



Figure 6a: *Yes/no*-question: 3 Accentual PhrasesFigure 6b: *Wh*-question: 2 Accentual Phrases

(Yun &amp; Oh 1996:48)

### 3.3 A comparison of Korean and English question formation

Yes/no-questions and *wh*-questions in Korean consist of the same syntactic string on the surface, but can be distinguished by their intonational phrasing. The sentence asks a yes/no-question if the AP boundary is placed after a *wh*-word and a *wh*-question if there is no boundary after the *wh*-word. In English, these two items are distinguished by choice of lexical item, different syntactic structures, as well as by intonational phrasing (although as we saw in Section 3.1, there is a distinct *wh*-question intonational pattern compared to a yes/no-question pattern).

## 4. Second Language Acquisition of Intonation

To date, not a lot of attention has been paid to the interaction between L1 and L2 acquisition of language intonation, but since numerous studies have been conducted on second-language phonology we can nonetheless make predictions as to what will be acquired by Koreans.

Many L2 studies on the segmental aspect of L2 acquisition show that the phonetic and phonological systems of the L1 interact with the L2 speech production system. Many of

these studies (i.e., Flege 1995, McAllister *et al*, 2002) have also shown that the degree of the interaction between the L1 and the L2 differs depending on the degree of proficiency in the second language. Ueyama & Jun (1998) have also shown that the L1 intonation system can affect L2 intonation patterns with respect to focus intonation. However, not all aspects of the L1 directly shape the L2 acquisition.

#### 4.1 Predictions

Based on previous research, we can predict that the phonetics and phonology of the L1 intonation will interfere with the acquisition of L2 intonation, and that the degree of this interference will probably depend on the degree of proficiency of the participant in the L2.

In this study, I focus on a few specific questions. First, English *wh*- and *yes/no*-questions differ with respect to the rising and falling intonational patterns at the end of the utterance. Jun & Oh (1996) found in their study on Korean *wh*-questions and *yes/no*-questions that the Korean participants used multiple different boundary tones (H%, LH%, HL%, and HLH%) in the same sentences. Their study showed that there was no single boundary tone type which was specific to one type of question. Their Korean participants had preferences for H% or LH% boundary tones for *yes/no*-questions (compared to a H% preference by native English speakers). For Korean *wh*-questions, the most common boundary tone was LH%, while H% and HL% were also used. English native speakers generally have an L% intonation boundary for *wh*-questions. One question that I will be addressing in the acquisition part of the study is whether Koreans are able to use native-English-like intonational patterns for boundary tones.

Another difference between English and Korean is that English has stress on certain words in an utterance (PA), while Korean has APs. For the L2 part of the study I investigate whether Koreans are able to use English-style PAs in their intonation, and I will also examine the Korean L2 data to see whether there are remnants of the Korean L-H-L-H tone pattern that is found in the Korean AP.

The final question which I address in this study is whether the level of English proficiency of participants affects their intonation.

## 5. Experimental Study

### 5.1 Subjects

One native female speaker of Canadian English participated as the control group and three Korean native speakers (two female speakers and one male speaker) participated as the experimental group of this pilot study. All Korean native speakers spoke a standard Seoul dialect of Korean. All speakers from the control and experimental groups were in their 20s or early 30s. In order to determine whether there was a developmental path in L2 intonation acquisition, I tested different proficiency levels within the experimental group. To establish their proficiency levels in English, all participants completed a standardized English grammar test (Oxford English Grammar Placement Test). For the native Korean speakers, one participant was considered to have a beginner level of English, one participant had an intermediate level of English, and the final participant had advanced English knowledge. Table 3 provides a summary of the data.

Participant	Sex	Time in Canada	Test Score
P1: Advanced	Male	16 months	80/100
P2: Intermediate	Female	10 months	68/100
P3: Beginner	Female	4 months	42/100

Table 3: Description of each participant with respect to gender, time in Canada, and score on the placement test.

## 5.2 Stimuli

The stimuli for this experiment were based on the Korean stimuli from Jun & Oh (1996), with some modifications that I made. Four Korean sentences (two sentences containing the *wh*-word ‘what’ *mwə* and two words containing the *wh*-word ‘who’ *nuka*) were selected so that each sentence could be interpreted in 2 ways: as a *wh*-question and as a *yes/no*-question. Following Jun & Oh (1996), each *wh*-word was preceded by the adverbial phrase *onil tʃənjək-e* ‘tonight’. In Korean, the *yes/no* question or the *wh*-question interpretation was triggered by the type of answer to the question. If the answer started with ‘yes’ or ‘no’, then the question should be interpreted as a *yes/no*-question, otherwise the question should be interpreted as a *wh*-question. The same stimuli were also presented in English for the L2 part of the study. 3 and 4 below show sample ‘what’ and ‘who’ questions respectively.

- (3) a. Q: onil tʃənjək-e mwə məkəjo  
 today night-in what eat  
 What are we eating tonight?  
 A: bap mogo  
 rice eat  
 We will eat rice.
- b. Q: onil tʃənjək-e mwə məkəjo  
 today night-in what eat  
 Are we eating anything tonight?  
 A: ne mwə məjəjaʃo  
 yes something eat  
 Yes, we are eating something.
- (4) a. Q: onil tʃənjək-e nuka wa  
 today night-in who come  
 Who is coming tonight?  
 A: nuna wa  
 sister come  
 My sister is coming.

- b. Q: onil        tʃənjək-e    nuka        wa  
 today        night-in    who        come  
 Is anyone coming tonight?
- A: ne        nuka        wa  
 yes        someone    come  
 Yes, someone is coming.

### 5.3 Procedure

After completing a brief questionnaire which asked participants questions about their language background, length of time in Canada, and the placement test, participants moved onto the production task. Both the questions and the corresponding responses were written on cue cards and the participants were asked to read the questions and the responses aloud. Both the question and answer were recorded using an Edirol digital recorder.

### 5.4 Measurements

The recordings were analyzed using the acoustic speech analysis software Praat® (Boersma & Weenink 2010). For the phonological description of the Korean L1 data, the type of pitch accent and phrase boundaries occurring in each utterance was labeled adopting the framework described in Jun (1993; 1998). For the phonological description of English L1 and L2 intonation, the type of pitch accents and phrase boundaries occurring in each utterance was labeled adopting the framework described in Beckman & Pierrehumbert (1986). For the phonetic analysis of intonation, F0 and times from several points (corresponding to the Korean AP boundaries) in each utterance were collected.

## 6. Results and Discussion

### 6.1 English L1 Results

I will illustrate the pattern of the results using two sentences with the *wh*-word *what* and two sentences with the *wh*-word *who*.<sup>24</sup> This section looks at the native English speakers' data.

In the first sentence *What are we eating tonight?* we can see a PA on the word *eating* (on *eat*). This is demonstrated by a maximum pitch of 341Hz, a minimum pitch of 233 Hz and a mean pitch of 286Hz for this word. As we have already observed with *wh*-questions, there is a falling pitch contour at the end of the question. This is observed in this sentence by a final drop in pitch. The maximum pitch for *tonight* is 247Hz. It has a minimum pitch of 175Hz and a mean pitch of 193Hz. These numbers are considerably lower than what we observed for *eating*. This utterance is shown in below in Figure 7.

<sup>24</sup> This data is representative of all the data collected in this study. Due to space limitations, I focus only on a small number of stimuli items.

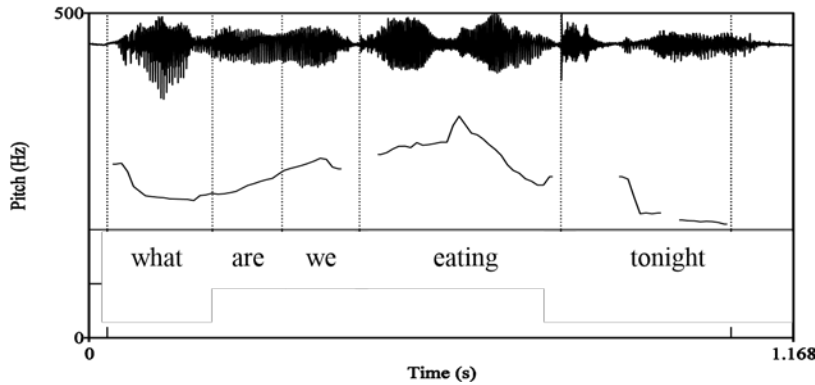


Figure 7: English L1 speaker: *What are we eating tonight?*

In the next *wh*-question *Who is (Who's) coming tonight?* the main stress falls on the *wh*-word *who* and then the pitch falls off for the rest of the utterance. While *who's* has a maximum pitch of 391Hz, a minimum pitch of 334Hz, and a mean pitch of 367Hz, the pitch readings for *coming* and *tonight* are significantly lower. *Tonight* has a maximum, minimum, and mean pitch of 267Hz, 196Hz, and 213Hz respectively (which is similar to the sentence *What are we eating tonight?*).

In the *yes/no*-question *Are we eating anything tonight?* we see a steady increase in pitch between *eating*, *anything*, and *tonight*. Unlike for the falling *wh*-question, *tonight* in the *yes/no*-question has a maximum pitch of 387Hz, a minimum pitch of 317Hz, and a mean pitch of 337Hz. This question is shown in Figure 8.

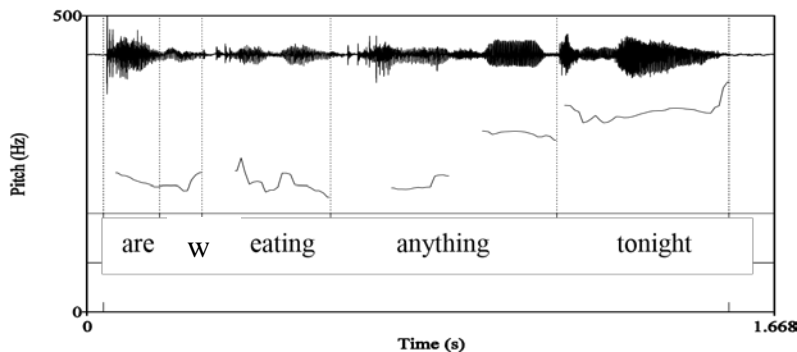


Figure 8: English L1 speaker: *Are we eating anything tonight?*

The final *yes/no*-question that I discuss in this paper is the question *Is anyone coming tonight?* In this utterance, the pitch is rising steadily (as we saw for the *yes/no*-question in Figure 8). In this question, *anyone* has a mean pitch of 234 Hz, *coming* has a mean pitch of 311 Hz, and *tonight* has a mean pitch of 348 Hz. This is very close to the mean pitch for the word *tonight* in *Are we eating anything tonight?*

As can be seen from the data and figures presented in this section, this data supports falling intonation for *wh*-questions and rising intonation for *yes/no*-questions.

## 6.2 Korean L1 Results

This section discusses results from the Korean L1 data. The goal here is to see whether the Koreans I tested successfully replicate the study done by Jun & Oh (1996) and I am

specifically interested in investigating what the Koreans are doing with the intonation boundary at the end of the question.

Overall, my study generally replicated the findings of Jun & Oh's (1996) study. Jun & Oh (1996) found that in their study on Korean *wh*-questions and yes/no-questions, the Korean participants used multiple different boundary tones (H%, LH%, HL%, and HLH%) in the same sentences. Their study showed that there was no single boundary tone type which was specific to one type of question. Their Korean participants had preferences for H% or LH% boundary tones for yes/no-questions. For Korean *wh*-questions, the most common boundary tone was LH% while H% and HL% were also used.

I analyzed boundary tones across speakers and found that all three of my participants used either an H% or an LH% for all of the Korean sentences. Unlike the findings of Jun & Oh (1996), where some of their participants used HL% and HLH% boundary tones, my participants did not show this variability. Figure 9 shows a sample of P1's (a male speaker) rising (LH%) intonation at the end of the sentence *onil tʃənjək-e nuka wa* 'Who is coming tonight?'. We also see in Figure 9, that the speaker is not marking the *wh*-question (as in Jun & Oh 1996) with an AP boundary before the *wh*-word.

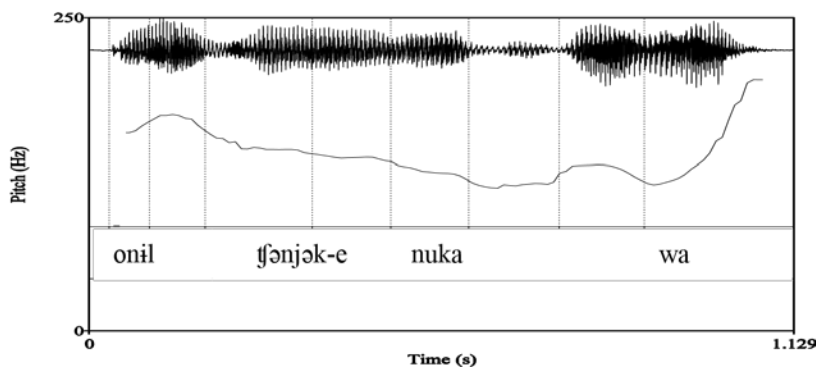


Figure 9: Korean (P1) L1 speaker: *onil tʃənjək-e nuka wa* 'Who is coming tonight?'

For the Korean L1 data, all of the data I collected had a rising H% or LH%. In the following section, we see what the Koreans do in the L2 study with the rising intonation.

### 6.3 L2 Results: *Wh*-questions

For the sentence, *What are we eating tonight?* In L1 English, we saw a PA on the word *EATing*) and observed a falling pitch contour at the end of the question. For the L2 learners, P1 was the most native-like in the falling intonation on *tonight*. His maximum pitch for that word was 123Hz, the minimum pitch was 91Hz, and the mean pitch was 107Hz. However, he was not like the native English speaker with respect to placing a PA on *EATing*. Also, unlike the native English speaker, P1 had numerous pitch resets which, in English, could signify a new PP. Perhaps in this case, he is treating the English PP similar to the Korean APs. Also worth mentioning is that this participant put a large pause between *what are we* and *eating tonight*, although he does not do this in his L1. It appears to be an isolated case and this was the first sentence I recorded with him so he may have just been nervous. Figure 10 shows this data. P1 also showed a native-like pattern for the *wh*-question *Who's*

*coming tonight?*. He placed the main stress on the wh-word *who* and then his pitch fell off for the rest of the utterance, as we saw for the native English speaker.

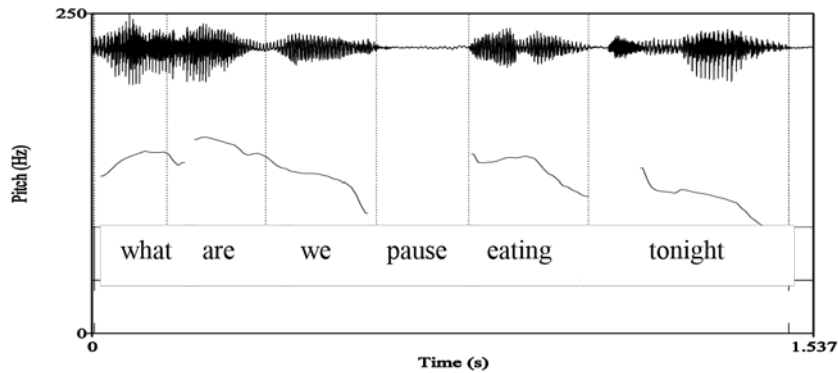


Figure 10: English L2 (P1): *What are we eating tonight?*

Participants 2 and 3 both used similar intonation for wh-questions. They both had a final rising intonational phrase boundary, and for both of these participants, the word *tonight* had very high pitch in the question. The maximum pitch for these two participants was 399Hz (P2) and 398Hz (P3), the minimum pitch was 187Hz (P2) and 182Hz (P3), and the mean pitch was 228Hz (P2) and 318Hz (P3). Clearly this pattern is one which may have transferred from their first language. Participant 3's data is shown in Figure 11.

For the wh-word intonation, these two participants generally differed in their intonation. Here, participant 3 was more native-like. Participant 2 often had a large drop in pitch when she pronounced wh-words.

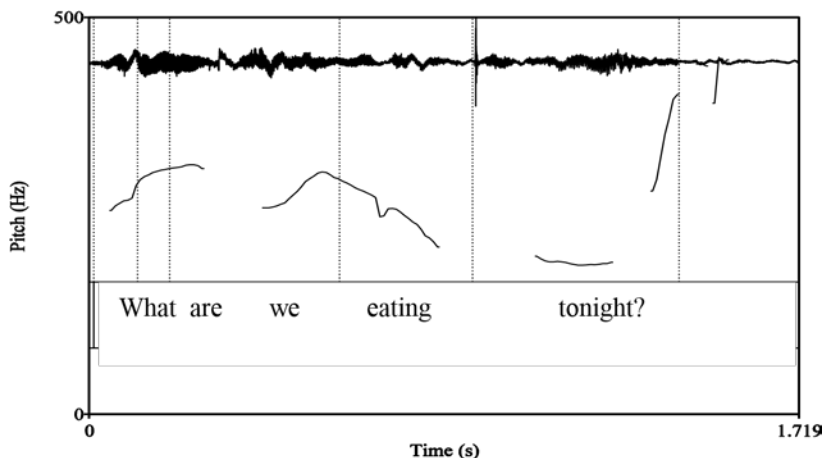


Figure 11: English L2 (P3): *What are we eating tonight?*

#### 6.4 L2 Results: Yes/No-Questions

In English *yes/no*-questions, the pitch rises steadily as the sentence progresses. In all of the Korean data, for all three participants, there is no gradual rise in pitch, but rather a sudden peak at the end of the utterance (as we saw in the Korean data). We also see dephrasing in almost all the Korean L2 data on *yes/no*-questions. There seems to be one pitch accent

early in the question and then a steady decline in the pitch contours until the end of the utterance. This is illustrated in Figure 12.

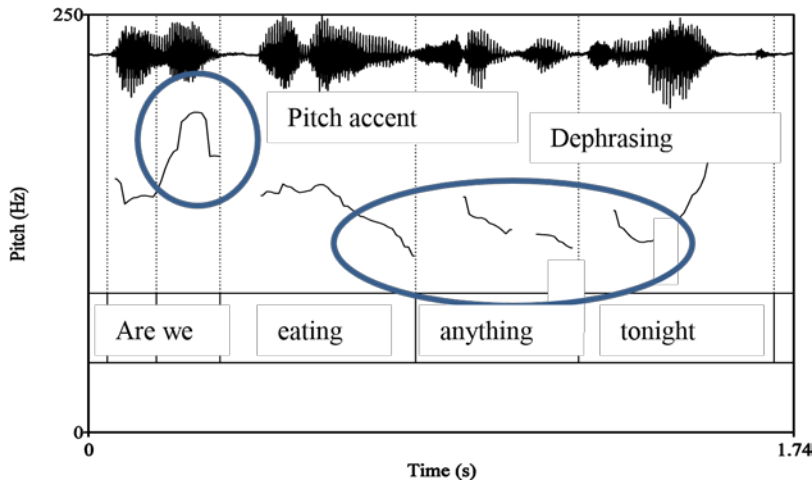


Figure 12: English L2 (P1): *Are we eating anything tonight?*

## 7. Conclusion

If we return to the questions from the beginning of the paper: Does the L1 intonation system affect L2 intonation patterns? and Does a higher level of proficiency in the second language improve L2 intonation? The answer to the first question is clearly yes. We saw in the data that two of the native Korean speakers participating in this study did not seem to be aware that English *wh*-questions typically have falling intonation and not rising intonation. In their L1, while *wh* questions can have either H%, LH%, HL%, or HLH%, all my participants used H% or LH% in their L1. P1, the most advanced learner of English, was the only participant who used falling intonation for these types of questions, so this likely had been acquired from studying English and indicates improvement with greater exposure. Clearly, the native Korean speakers are not performing at a native-like level with respect to prosody and intonation in these sentences.

### 7.1 Limitations and Directions for Future Research

This study was a pilot study which tested intonational patterns of three native Korean L2 learners of English on a limited set of data. I am currently extending this study to include more participants, as a higher number of participants would enable me to draw more generalizations. I am also including a larger range of levels of proficiency in my study, including near-native speakers who have spent a large amount of time in an English-speaking country.

To get a more accurate view of what second language learners do with intonation, I am working on extending this production task to include a processing and a perception task. This would give us a better idea of not only how L2 learners produce intonation, but also whether they have acquired enough detail about the second language they are learning to be able to perceive and process intonation like native speakers of a language.



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