

**How cute do I sound?:
The iconic function of segmental alternation in Korean baby-talk register, *Aegyo***

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Abstract

This paper presents the corpus and experimental studies of segmental alternation as strategies of the baby-talk register in Korean, *Aegyo*. Using a frequency analysis on Twitter and a cuteness-rating experiment, we address questions about the relationship between types of segmental alternation used in the *Aegyo* register and the iconic strength of *Aegyo* expressions. We find that the preference for *Aegyo* expressions and the degree of cuteness of *Aegyo* forms are determined by how natural the sound sequence resulting from the alternations was in Korean phonological structure. This suggests an interaction between the pure phonological constraints and the register-specific constraints in core grammar. We also find evidence that gender and age can be at play as a scaling factor of the register-specific constraints: older speakers and female speakers are more sensitive than are younger and male speakers to levels of cuteness in *Aegyo* expressions, depending on the segmental alternation used in the expressions. This is because the function of *Aegyo* register is to set up a special childlike persona of addressers in intimate relationship by rejecting mature language and intentionally speaking like a child.*

Keywords: Baby-talk speech register, iconic strength, segmental alternation, gender and age effects

1. Introduction

Language is a systematic means of verbal communication. Jakobson (1960) points out six aspects of effective verbal communication as shown in Figure 1. In any verbal communication, an *addresser* (a speaker or writer) delivers a message to an *addressee* (a listener or reader) in *contact* (a physical channel and psychological connection). To interpret the message correctly according to the intention of the addresser, the addresser and addressee must share a *context* and *code* for the message. The context includes a situation, object, or mental state that the message refers to. The code represents any linguistic means, such as words, sentence structures, and speech styles, that are used to convey the message.

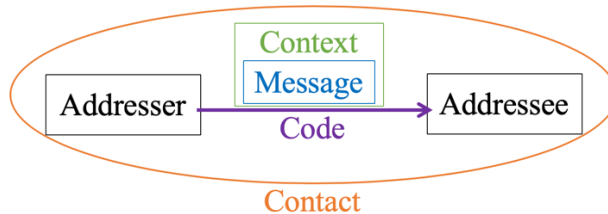


Figure 1. Six factors of effective verbal communication (Jakobson 1960)

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We use distinct codes of speaking in different types of speech situations. The linguistic varieties that have a special function for effective communication in a particular speech situation are called *speech registers* (Ervin-Tripp 1977; Ferguson 1977). In the literature of language education, the term register refers narrowly to the degrees of formality in speech or writing. For example, the formal register is appropriate for professional writing, public speeches, and academic presentations, while the casual register is appropriate in more informal situations with intimate addressees. Speech register, however, covers a broader scope of social situations, including geographic regions (dialects), special academic fields (technical terms, jargons), and particular social groups (slangs).

This paper is about the baby-talk register in Korean. The baby-talk register is related to child-directed speech, but they are different. Adult speakers as caregivers speak differently to infants, young children, or pets using the child-directed speech in order to elicit their attention (Fernald & Simon 1984), to facilitate language-acquisition (DePaulo & Bonvillian 1978), and to communicate affective intentions (Fernald 1989). The major characteristics of the child-directed speech are simplified vocabularies and sentence structures, repetitive questioning, exaggerated intonation, high pitch, and a slow tempo. The baby-talk register is used when adults communicate with lovers or close friends. In each situations, an adult addresser speaks like a baby to transfer and/or evoke affection and positive emotions to an adult addressee (Ferguson 1977; Bombar & Littig 1996; Shaver & Mikulincer 2006; Kranjčič 2016). The Korean baby-talk register is called as *Aegyo* and it is generally known that the major function of the special register is to sound cute (Park 2010; Ahn 2017). Other East-Asian cultures also have a baby-talk register that is used between adult speakers: *Sajiao* ‘to unleash coquettishness’ in mainland Chinese and Taiwanese (Hardeman 2013; Yueh 2013) and *amai koe* ‘sweet voice’ in Japanese (Doi 1986; Starr 2015). The baby-talk register is characterized by childish expressions and pronunciations, repetitions of sounds, child-like voice, nasalized voice quality, and high pitch (Ohala 1983, 1994; Puzar 2011; Strong 2013; Hardeman 2013; Starr 2015). In particular, a high pitch has been held to correspond to smaller and subdominant referents because of the anatomical size differences in the vocal tract in the production of the high pitch (Ohala 1994). Several research programs show that speech in a higher pitch is also related to femininity (Ohara 2001) and politeness (Shin 2005).

In Korean Aegyo expressions, the most noticeable linguistic aspect is a so-called “short tongue” sound, speaking with a lisp (Park 2010). The short tongue sounds used in Aegyo expressions include varieties of segmental alternations. Examples in (1) show possible types of segmental alternations in Aegyo variants of /mak-as’-Λ/ eat-Past-Dec [makΛs’Λ] ‘(I) ate (something)’.

- (1) Segmental alternations in Aegyo forms of /mak-as'-Λ/ [makas'Λ] '(I) ate (something)'
- | | | |
|----|-----------------------------|-----------------------------------|
| a. | Affrication of fricatives | [makΛtɕ'Λ] |
| b. | Stopping of fricatives | [makΛt'Λ] |
| c. | /j/-insertion before vowels | [makΛjʷjΛ] |
| d. | Rounding of vowels | [makas'o ~ makos'o ~ mokos'o] |
| e. | Nasal coda insertion | [makas'Λŋ ~ makas'Λm ~ makΛŋs'Λŋ] |

This study focuses on the types of Aegyo variants in (1a–c) that show alternations of fricatives. The same fricatives alternate in three different ways in Aegyo expressions. It has been consistently reported that fricatives /s/ and /s'/ are the last required sounds in Korean language development (Kim & Pae 2005) and those are the most frequently replaced sounds in the speech of children with articulation and phonological disorders (Cheon & Lee 1999).

Considering that Korean children acquire affricates before fricatives (Pae 1995), affrication of fricatives in (1a) can be explained as mimicry of child-specific phonology as an Aegyo strategy to speak like children. Affrication of fricatives occurs in any positions in Aegyo forms and affrication is often accompanied by tensification, as in /sok.san̩.hɛ/ [tɕ'oktɕ'anhɛ] 'I am upset'.

In fact, affrication of fricatives is a typical example of expressive palatalization (Alderete & Kochetov 2017; Kochetov & Alderete 2011) that cross-linguistically occurs in baby-talk registers, diminutive constructions, mimetic vocabularies, and hypocoristics as in (2).

- (2) Examples of expressive palatalization (Alderete & Kochetov 2017)
- | | | | |
|----|-----------------------|-------------------------------------|----------------------|
| a. | Japanese babytalk | | |
| | /osarusan/ | [otʃarutʃan] | 'monkey (honorific)' |
| | /omizu nominasai/ | [omidʒu nominatʃai] | 'Drink your water!' |
| b. | Huave diminutives | | |
| | [sono ^h g] | [ʃu ^h pu ^h g] | 'pile up' |
| | [lohɕ] | [ʌuhɕ] | 'pierce' |
| c. | Polish hypocoristics | | |
| | Adam [adam] | Adas [adaɕ] | |
| | Monik-a [mɔnika] | Monisi-a [mɔniea] | |

Expressive palatalization is different from phonological palatalization in two ways. First, affrication of fricatives is a major characteristic of expressive palatalization, but phonological palatalization never changes fricatives to affricates (Bhat 1978). Second, expressive palatalization occurs

without a trigger as shown in (2), while phonological palatalization is an assimilatory phenomenon triggered by high vocoids. Ohala (1994) argues that there are sound-symbolic associations between acoustic structures of affricates, such as the high intensity of strident noise and high F2 and pitch, and the concept of child-like behavior, smallness, or affection.

Korean Aegyo expressions seem to realize expressive palatalization in a different way in addition to affrication, insertion of a palatal glide before a vowel as in (1c). The alveolar fricatives /s/ becomes the palatal fricatives /ʃ/ before high vocoids /i, j/ in Korean (Ahn, S-C 1985; Jun 1996). As an Aegyo strategy, an epenthetic palatal glide creates an environment of phonetic palatalization that triggers assimilation of fricatives even in a special speech register in which palatalization is motivated by iconic sound-symbolic functions. In Aegyo expressions, the palatal glide /j/ can be inserted before vowels regardless of the preceding consonant, as in /na.to nʌ.mu tɔ.o.a/ [nʲatʲo nʲʌmjʊ tɔjoa] ‘so good’.

Another noticeable alternation of fricatives in Aegyo expressions is stopping, as in (1b). Since stopping of fricatives occurs frequently in the speech of Korean children age between 2 and 5 (Kim 2006), this type of Aegyo variants can be hypothesized as mimicry of child-specific phonology. As in affrication of fricatives, tensification often co-occurs with the stopping of fricatives. Tense stops appear first in most Korean children’s speech among the three different types of stops (Kong et al. 2011). In addition to fricatives, affricates become stops in Aegyo expressions, as in /tɕhi.tɕu tu tɕaŋ/ [tʰitʰu tu tʰaŋ] ‘two slices of cheese’.

It is possible to use a single alternation strategy in Aegyo expressions as in (1), but multiple types of alternation could be used together. Only the combinations of the fricative alternations as the subjects of this study are listed in (3), but other combinations of alternation strategies are possible, e.g. fricative affrication + vowel rounding [mʌkʌtɕ’o], /j/-insertion + nasal coda insertion [mʌkʌʃʲjʌŋ ~ mʌkʌʃʲjʌm], fricative stopping + vowel rounding + nasal coda insertion [mʌkot’oŋ], among others.

- (3) Combination of alternations in Aegyo variants of [mʌkʌs’ʌ] ‘(I) ate (something)’
- | | | |
|----|-----------------------------|-------------|
| a. | Affrication + /j/-insertion | [mʌkʌtɕ’jʌ] |
| b. | Stopping + /j/-insertion | [mʌkʌtʰ’jʌ] |

Considering three Aegyo strategies that alternate fricatives in (1a–c) and their combinations in (3), there are five possible Aegyo variants of [mʌkʌs’ʌ] ‘(I) ate (something)’ as shown in Table 1. It is assumed that Korean speakers can stylistically choose to use any types of Aegyo strategies in a particular situation.

Table 1. Aegyo variants of [makas'ʌ] '(I) ate (something)'

	Fricative	Affrication	Stopping
No vowel change	[makas'ʌ]	[makʌtɕ'ʌ]	[makʌt'ʌ]
/j/-insertion	[makʌjʷjʌ]	[makʌtɕ'jʌ]	[makʌt'jʌ]

This study is motivated by two research questions: (i) Do those Aegyo variants have different degrees of cuteness? Do combinations of strategies strengthen the expressive function of Aegyo expressions? (ii) If there is a difference in the degree of cuteness of Aegyo variants, are speakers differently sensitive to the difference depending on their gender or age? Jang (to appear) has conducted the frequency analysis on Twitter and the rating experiments for the first research question. The research, however, focused only on written Aegyo expressions in tweets and did not compare age and gender differences in the rating experiment. In this paper, we re-examined the usage frequency of Aegyo variants on Twitter by considering emoticons together with and conducted the cuteness rating experiment with 74 Korean native speakers of various ages and genders. Our results find a combination of Aegyo strategies is more often used and rated cuter than a single strategy if the segmental alternation as the combinatory output is phonologically natural. Our results also suggest that older speakers are more sensitive than are younger ones and female speakers are more sensitive than males are to the difference in degrees of cuteness among Aegyo strategies.

The paper is organized as follows. Section 2 presents the usage frequencies of Aegyo strategies on Twitter. Section 3 introduces the methodology and presents the results of the cuteness rating experiment. Section 4 discusses the connections between the general phonological grammar and the register-specific grammar and also comments on the social factors in the use of speech registers. Section 5 concludes.

2. Usage frequency analysis in Twitter

2.1 Method

In this study, we collected Aegyo expressions used on Twitter (www.twitter.com), one of the most popular text-based social network services (SNS). Aegyo, as a special speech register intended to deliver speakers' affection and cuteness to persons with whom they intimate, is very actively used both in spoken and written Korean. In text-based online or mobile platforms, language users tend not to follow the spelling rules of the written language, but to write as close to pronunciation as they say in casual speech. For this reason, SNS provides very good data for studying Aegyo variations, as we focus only on segmental alternations without the effect of additional expressive cues, such as intonation or facial expression. This study targeted Twitter to investigate the usage frequency of Aegyo variants because Twitter is the major online site where postings and conversations about the k-pop culture are most active

recently in Korea. K-pop fans use Twitter to share information or multimedia content and to sell or buy the merchandise of artists. Aegyo expressions are commonly used when fans comment about their favorite artists and talk to other fans who like the same artist or to friends.

To narrow the scope of searches on Twitter, we collected only tweets that included the Aegyo variants of /ha-ʌs'-ʌ/ do-Past-Dec [hɛs'ʌ] 'did' that are listed in (4). Due to the stem verb /ha-/ 'do' as an auxiliary verb, [hɛ.s'ʌ] 'did' can be combined with nouns, adjectives, and adverbs as a suffix, as in [koŋ.pu.hɛs'.ʌ] study(n.)-did 'studied', [sun.su.hɛs'.ʌ] pure(adj.)-did 'was pure', and [teal.hɛs'.ʌ] well(adv.)-did 'well done'.

(4) Aegyo variants of [hɛs'ʌ] 'did' as the searching keywords in the Twitter analysis

- | | | |
|----|-----------------------------|-----------|
| a. | No segmental change | [hɛs'ʌ] |
| b. | Affrication of /s'/ | [hɛtɕ'ʌ] |
| c. | Stopping of /s'/ | [hɛt'ʌ] |
| d. | /j/-insertion | [hɛʃ'jʌ] |
| e. | Affrication + /j/-insertion | [hɛtɕ'jʌ] |
| f. | Stopping + /j/-insertion | [hɛt'jʌ] |

Since a fricative in [hɛs'ʌ] is tensed, any potential effect of tensification of fricatives on the preference for Aegyo expressions can be avoided in this analysis. The simplest way to create Aegyo expressions without any segmental changes is resyllabification of coda consonants to onsets of the following syllable as in (4a), [hɛs'ʌ] > [hɛ.s'ʌ]. Other variants of [hɛs'ʌ] in (4) are based on the syllabification of the simplest form.

In this study, we crawled tweets posted in Korea from 25 March to 2 April and from 5 to 13 July 2018 using a python library called Tweepy (www.tweepy.org) that can access the Twitter application programming interface (API). The crawling process targeted tweets that include the search keywords in (4). Homophones like [hɛ t'ʌ] 'The sun rises' were manually excluded before the analysis. Tweets that repost another tweet without any new comments were not included in the analysis. After the manual data-cleaning process, the number of collected tweets that was 2,187. This data was used for the frequency analysis of Aegyo expressions in Jang (to appear).

Since there are no nonverbal cues in written language, it has been argued that emoticons and emojis have an important social function in written communications. Emoticons are typographical representations of facial expressions, e.g. ^-^ and emojis are actual images, e.g. 😊. Emojis are not limited to facial expressions. The use of emoticons helps people communicate in text-based platforms like Twitter by augmenting the attitude to conversational topics or partners to convey nuanced meanings in

messages (Lo 2008; Gajadhar & Green 2005; Provine, Spencer, & Mandell 2007; Do & Choi 2017). Besides expressing emotions or attitudes, emojis are also used for other social functions in textual communication: starting conversations and creating a unique and playful mood in communication (Kelly & Watts 2015). Our question is then how the use of emoticons is related to the iconic strength of Aegyo expressions that are used mainly for dealing with a particular listener with an important relationship.

To answer this question, we counted how many tweets included both Aegyo expressions and facial representations using emoticons or emojis. Tweets were counted only when Aegyo expressions and moticons/emojis were adjacent in the same context. In particular, we distinguished between the common emoticons and the cute ones. Some of the emoticons that are used in Korean represent cute faces by changing the shape of the mouth part in emoticons or by including a lot of special characters like eyebrows and arms as shown in Table 2. Even with the neutral emotion in the facial representation, cuteness could be represented. The emoticon (:3, for example, represents a vertical cute face by making a puppy-like mouth using ‘3’. Many of the cute emoticons come from *kaomoji*, a class of emoticons that are made using Unicode characters (Ptaszynski et al. 2010; Bedrick et al. 2012).

Table 2. The common vs. cute emoticons for representing the same emotion

	Common emoticon/emoji	Cute emoticon
sadness	ㅍㅍ, ㅍ-ㅍ, ㅍㅍㅍ, ㅍ_ㅍ, 😞, 😓	ㅍㅍㅍㅍ, (ㅍ^ㅍ), ㅍㅍㅍㅍㅍ, ;ㅍ, 88 ㅍ 88, 8 ㅍ 8, ㅍ^ㅍ, (ㅍ ㅍ ㅍ), ㅍ_ㅍ
happiness	^^, ^-^, 😊, 😄	^ㅍ^, ^ㅍ^, ^ㅍ^, (ㅍㅍㅍ), (‘ㅍ’), (ㅍ ㅍ ㅍ), (ㅍㅍㅍ), (*ㅍㅍ*), ㅍ(ㅍ>ㅍ< ㅍ)ㅍ
surprise	0_0, 😮, 😲	ㅇㅍㅇ, ㅇㅍㅇ, (((0 ㅍ 0))), (°ㅍ°), 000, (•ㅍ•), Σ(O_0 ;), (@Σ@), ㅍ(°ㅍ°)ㅍ

Since we define emoticons as graphic representations of facial cues following Walther and D’Addario (2001), onomatopoeias such as ㅋ ㅋ [k^hik^hi] and ㅎ ㅎ [hihi ~ haha] that imitate laughing

sounds in written Korean were excluded in the counting. Special symbols like a heart and star were also not considered as emoticons.

2.2 Hypotheses and predictions

The basic assumption was that segmental alternations that have a stronger iconic function in Aegyo register would be used more frequently in written Aegyo expressions on Twitter than ones that have weaker iconic strength since there are no acoustic and nonverbal cues in written forms. Aegyo expressions can be created by using a single type of segmental alternation or by using multiple types of segmental alternation together. If we hypothesize the cumulative effect of segmental alternation on the iconic strength of Aegyo forms, we can predict that Aegyo variants that are made by two segmental alternations make the expression cuter than do other variants in which a single type of segmental alternation occurs for the same original form. Expressions with no segmental changes are predicted to be less cute than ones with one or more expressive strategies for Aegyo. Predictions for Aegyo variants of [hes'ʌ] 'did' are presented in (5). The /j/-insertion variant [hej'jʌ] is considered to include a single type of segmental alternation because palatalization of /s/ is phonetically automatic due to the following adjacent /j/.

(5) Hypothesis 1.

The greater the number of segmental alternations used in Aegyo, the more preferred the form is.

Prediction for the usage frequency: [hɛtɕ'jʌ], [hɛt'jʌ] > [hɛtɕ'ʌ], [hɛt'ʌ], [hej'jʌ] > [hes'ʌ]

Although segments change to make the linguistic expression function in a particular speech register, outputs of the segmental changes can be evaluated according to the phonological grammar of a language. In Korean, stops are palatalized to affricates before high vocoids /i, j/, as in /mat-i/ [matɕi] 'The eldest one'. In the second hypothesis, Aegyo variants that are more natural in the general phonology are assumed to be preferred to the less natural ones even in written forms. Under this hypothesis, two variants of [hes'ʌ] that are made by two types of segmental alternation, [hɛtɕ'jʌ] and [hɛt'jʌ], are expected to be preferred in different degrees as in (6), because the sequence of an affricate and the palatal glide is phonologically natural in Korean while the sequence of a stop and the palatal glide (i.e. no palatalization before /j/) is unnatural. Due to the phonological unnaturalness, the stopping+/j/-insertion variant [hɛt'jʌ] is expected to be weaker as an Aegyo expression than would Aegyo variants made by a single strategy. The variant [hes'ʌ] with no segmental changes is predicted to be the weakest with [hɛt'jʌ].

(6) Hypothesis 2.

The more phonologically natural an Aegyo form is, the more preferred the form is.

Prediction for the usage frequency: [hɛtɐʰjʌ] > [hɛtɐʰʌ], [hɛtʰʌ], [hɛʃʰjʌ] > [hɛtʰjʌ], [hɛsʰʌ]

The third hypothesis for the frequency analysis concerns the usage of emoticons in Aegyo expressions. The major function of emoticons is to augment the emotions of writers using graphical representations. Aegyo register, however, is not related to writers' emotions. Aegyo expressions help writers to portray themselves as naïve and childlike, as someone who needs more care and love in the relationship (Bombar & Littig 1996; Shaver & Mikulincer 2006; Park 2010). Considering the difference in the function of emoticons and baby-talk register, the use of common emoticons as additional devices to convey emotions is predicted regardless of the iconic strength of Aegyo variants in the same sentence. The emoticons that are used to express cuteness as well as emotions, however, are expected to be used more in weak Aegyo expressions, assuming that they complement verbal strategies in Aegyo register as in (7).

(7) Hypothesis 3.

The use of cute emoticons complements and enhances the cuteness of Aegyo forms.

Prediction: Cute emoticons will be used more frequently in weaker Aegyo variants.

Common emoticons will be used in similar frequencies with all variants.

2.3 Results

The examples of Aegyo variants of [hɛsʰʌ] 'did' in tweets are shown in (8). In the examples, we can observe the use of onomatopoeia such as [kʰuŋ] 'bump/thump', [hɥikɥik] 'swoosh', [kjaʊtʰuŋ] 'slantwise' inside Aegyo expressions. Some examples show that the same segmental alternation as a linguistic Aegyo strategy can be used several times in a single sentence. For example, stopping of fricatives /s, sʰ/ occurs three times in [tʰoktʰaŋhɛtʰʌ] as an Aegyo form of /sok.saŋ.hɛsʰ.ʌ/ 'I was upset'. In this case, the stopping of /s/ is accompanied by tensification. As another example, in [amjukʌtʰjo anɛʃʰjʌ] as an Aegyo form of /a.mu.kʌs.to an.hɛsʰ.ʌ/ 'I did nothing' /j/-insertion occurs three times.

(8) Aegyo variants of [hɛsʰʌ] 'did' that are used on Twitter

a. No segmental alternation

/nɛ.il ka.ki.ro hɛsʰ.ʌ/	[neil kakiru hɛsʰʌ]	'I'm going to go tomorrow.'
/kʰuŋ.hɛsʰ.ʌ/	[kʰuŋ hɛsʰʌ]	'I banged my head.'
/min.maŋ.hɛsʰ.ʌ/	[minmŋhɛsʰʌ]	'I was embarrassed.'

b. Affrication of /s’/

/iŋ hɛs’ .ʌ.jo/	[uŋ hɛtɕ’ʌjʌ]	‘Yes, I did.’ or ‘S/he said yes.’
/un.tɔŋ.to hɛs’ .ʌ/	[untɔŋto hɛtɕ’ʌ]	‘I exercised too.’
/ko.kɛ kja.u.t’uŋ hɛs’ .ʌ/	[kɔkɛ kjaut’uŋ hɛtɕ’ʌ]	‘S/he tilted her/his head.’

c. Stopping of /s’/

/tɕiŋ.sik.hɛs’ .ʌ/	[tɕiŋʃikʰɛt’ʌ]	‘(They) multiplied.’
/sok.saŋ.hɛs’ .ʌ/	[t’okt’ʌŋhɛt’ʌ]	‘I was upset.’
/pʰal.ro hɛs’ .ʌ.jo/	[pʰallohɛt’ʌjo]	‘I followed (your account).’

d. /j/-insertion

/ko.kɛ hɥik.hɥik hɛs’ .ʌ/	[kɔkɛ hɥikʰɥik hɛʃʷjʌ]	‘S/he shook her/his head.’
/hɛs’ .ʌ tɕʰuk.ha.hɛ/	[hɛʃʷjʌ tɕʰjukʰahɛŋ]	‘Did you do (that)? Congrats!’
/a.mu.kʌs.to an.hɛs’ .ʌ/	[amjukʌt’jo anhɛʃʷjʌ]	‘I did nothing.’

e. Affrication + /j/-insertion

/sim.teaŋ kʰuŋ.hɛs’ .ʌ/	[ʃimteaŋ kʰuŋhɛtɕ’jʌ]	‘My heart missed a beat.’
/a.ja hɛs’ .ʌ/	[aja hɛtɕ’jʌ]	‘I got hurt.’
/tɕʌ al.tʰi.hɛs’ .ʌ.jo/	[tɕʌ altʰihɛtɕ’jʌjʌ]	‘I did RT (re-tweet).’

f. Stopping + /j/-insertion

/iŋ hɛs’ .ʌ/	[uŋ hɛt’jʌ]	‘Yes, I did.’ or ‘S/he said yes.’
/man.nan.ta.ko hɛs’ .ʌ/	[mannantjakju hɛt’jʌ]	‘(They) told me to meet.’
/hon.tea sɛŋ.pʰa.hɛs’ .ʌ/	[hontea sɛŋpʰahɛt’jʌ]	‘I had a birthday party alone.’

Figure 2 shows the token frequencies of Aegyo variants of /hɛs’ .ʌ/ ‘did’ on Twitter. The Aegyo variant that is made by both affrication of /s’/ and /j/-insertion [hɛtɕ’jʌ] was the most frequently used on Twitter (906 tweets) for the target search period. The second most frequent variant [hɛt’ʌ] that is made by the stopping of /s’/ was used in 862 tweets for the period. The no-segmental-change variant [hɛs’ʌ] was the third most frequent one in the collected Twitter data. The other three variants, the affrication-only [hɛtɕ’ʌ], the stopping and /j/-insertion [hɛt’jʌ], and the /j/-insertion-only [hɛʃʷjʌ] were observed in a small number of tweets, 50, 16, and 15 respectively.

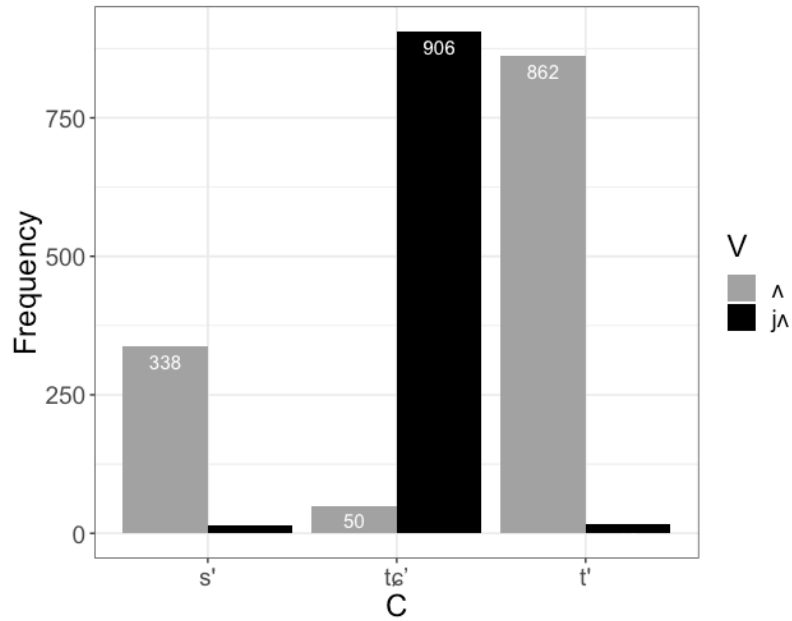


Figure 2. Token frequencies of Aegyo variants of /hes'.ʌ/ on Twitter

Figure 3 shows the proportion of facial emoticons and emojis that were adjacent to Aegyo expressions in tweets. The proportion of emoticons was similar to every type of Aegyo variant. Cute emoticons were used often with [hɛʃ'jʌ] and [hɛt'jʌ] variants in proportion.

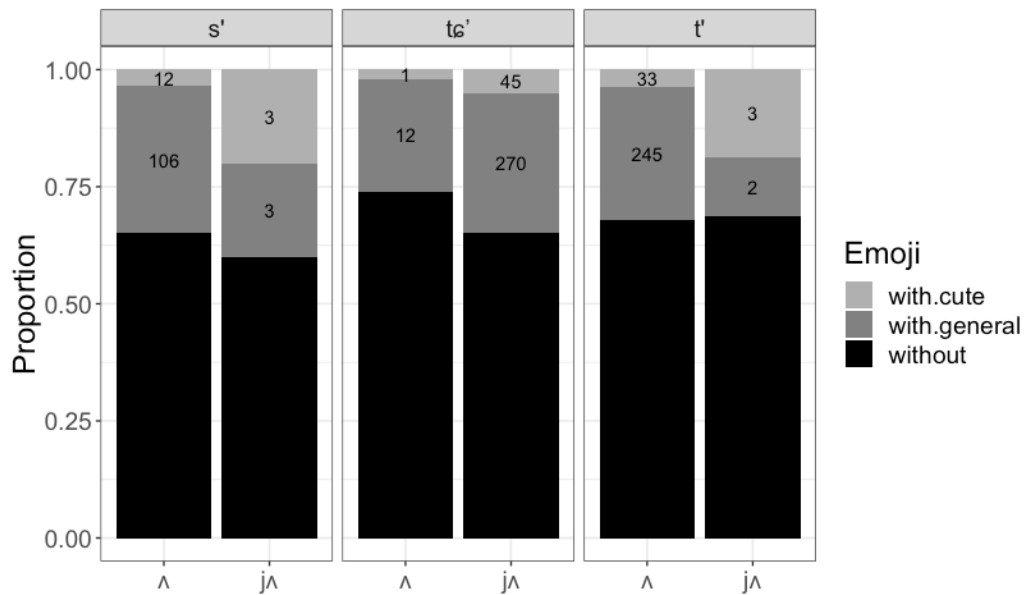


Figure 3. The proportion of emoticons adjacent to Aegyo expressions in tweets

2.4 Implications

The token frequency pattern of Aegyo variants of /hes'Λ/ 'did' on Twitter supports the second hypothesis about the effect of phonological naturalness on the iconic strength of Aegyo variants. The [hɛtɕ'jΛ] variant was the most frequently used on Twitter. This variant is made by two Aegyo strategies, the affrication and the /j/-insertion, and the output of those segmental alternations is natural in Korean phonology. As one of the least frequent variants, the stopping+/j/-insertion variant [hɛt'jΛ] is also made by combining two expressive strategies, but it includes a sequence of an alveolar stop and a palatal glide that is unnatural in Korean phonology. This means that the combination of Aegyo strategies is preferred to a single strategy if the segmental alternation as the combinatory output is phonologically natural.

Not all the frequency patterns, however, are consistent with the predictions of the second hypothesis in (6). Under the hypothesis, we predicted that Aegyo forms made by a single type of segmental alternation would be used at a similar frequency, while those without any segmental change would have a lower frequency: [hɛtɕ'jΛ] > [hɛtɕ'Λ], [hɛt'Λ], [hɛʃ'jΛ] > [hɛt'jΛ], [hes'Λ]. In the collected Twitter data, however, among Aegyo variants made by a single alternation strategy the stopping-only variant was used with the highest frequency, similar to [hɛtɕ'jΛ] that is made by a phonologically natural combination of two Aegyo strategies. The no-segmental-change variant [hes'Λ] was used more frequently than other variants that are made by a strategy or phonologically unnatural combination of two strategies: [hɛtɕ'jΛ], [hɛt'Λ] > [hes'Λ] > [hɛtɕ'Λ] > [hɛt'jΛ], [hɛʃ'jΛ].

Those frequency patterns might be explained by the usage frequencies of the sequences /s'Λ, s'jΛ, tɕ'Λ, tɕ'jΛ, t'Λ, t'jΛ/ in Korean (Kim 2005). As shown in Figure 4, the sequence of /t'Λ/ is the most frequently used. The sequence of /s'Λ/ follows and is more frequently used than /tɕ'Λ/. This seems to be related to the high usage frequency of the [hɛt'Λ] variant and the low frequency of the [hɛtɕ'Λ] variant in tweets.

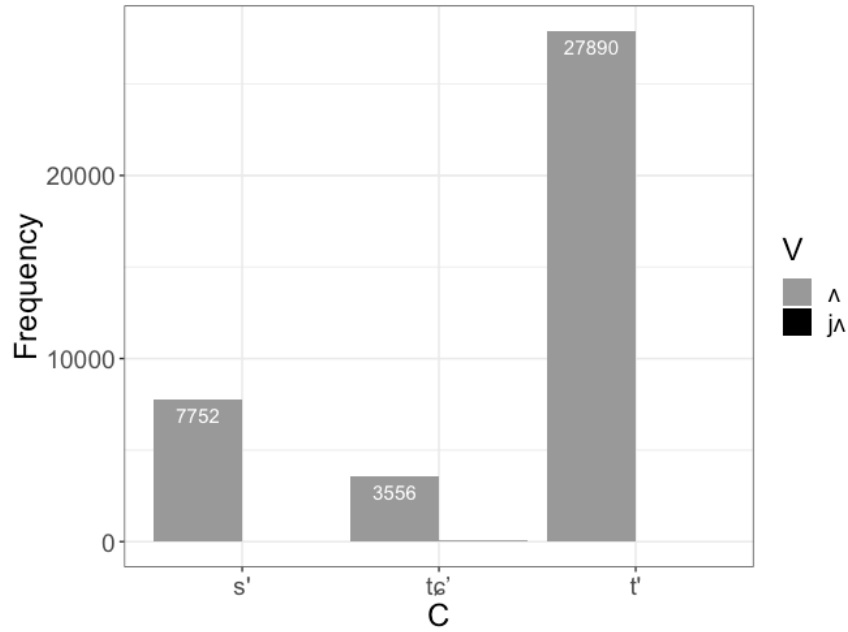


Figure 4. The usage frequencies of the sequences /s'ʌ, tɛ'ʌ, s'jʌ, t'ʌ, tɛ'jʌ, t'jʌ/ in Korean

The very low usage frequencies of the sequences that include /jʌ/ are based on the type frequency of those sequences in the Korean lexicon. There is no lexical item that includes /s'jʌ, t'jʌ/ and there is only one lexical item that includes the sequence /tɛ'jʌ/ in its conjugated forms: tɛ'i- 'steam', which is conjugated as tɛ'jʌ-, e.g. tɛ'jʌ.mʌk.ta 'eat by steaming', and tɛ'jʌ.nɛ.ta 'serve by steaming'. The least frequent use of the [hɛʃ'jʌ] and [hɛʃ'jʌ] variants on Twitter could be related to this. The most frequent use of the [hɛtɛ'jʌ] variant as Aegyo expressions in tweets, however, shows that rare sequences in the lexicon are allowed as outputs of segmental alternations for expressive purposes in a special speech register.

The limitation of the frequency analysis is that token frequencies might correlate with different preferences for Aegyo variants but preferences may not correspond to different degrees of expressive strength of Aegyo variants. Since the usage frequency patterns of types of segmental alternation in Aegyo expressions within a special register (Figure 2) and those in lexical items within a core grammar (Figure 4) are the same except for the frequency of /tɛ'jʌ/, it might be concluded that the core phonological grammar functions in differentiating preference for Aegyo variants regardless of their iconic strength within a particular speech register.

For this reason, to investigate the degrees of the iconic function of Aegyo variants in Twitter data more directly, facial emoticons and emojis that were adjacent to Aegyo expressions were counted and their proportions were compared according to Aegyo variants (see Figure 3). The result shows that a similar percentage of common emoticons and emojis was used, regardless of types of Aegyo variants. In the case of cute emoticons, a high percentage of them was used with the [hɛtɛ'jʌ] and [hɛʃ'jʌ] variants that

were the least frequent in the collected data (16 and 15 tweets respectively). These variants were expected to be the least cute as Aegyo expressions. Although the frequencies of those variants are so low that this result alone cannot determine the expressive strength of Aegyo variants, it seems that the pattern shows the potential compensation between verbal and nonverbal strategies that are used in a particular speech register.

To directly investigate the relative iconic strength of segmental alternations as verbal strategies in Aegyo register, a cuteness-rating experiment was conducted. The experimental result could avoid the potential effect of preference based on the usage frequency because the participants were instructed to rate “how cute” the given Aegyo expression was by comparing it to its original form, not how likely they would use it.

3. Cuteness judgement experiments

3.1 Method

The major function of Korean Aegyo register is generally to sound cute like children (Park 2010; Ahn, J.K. 2017). To compare how the expressive strength of Aegyo forms varies according to the types of segmental alternation used in making the iconic expressions, native speakers of Korean as the participants of this experiment were asked to judge the cuteness of Aegyo expressions on a 7-point scale (1: not cute at all ~ 7: very cute). At the beginning of the experiment, participants were instructed with the following statement: “Suppose a given Aegyo expression is used for you to act charming to your lover or close friends. Comparing its pronunciation to the original non-Aegyo pronunciation, please rate how cute the expression feels using 7 points. If you don’t feel it is cute at all, give it a point, or if you think it’s very cute, give it seven points. Try to pronounce it in your mind or say it out loud before determining your score.”

The Aegyo variants of 11 predicates in Table 3 were the stimuli in the experiment. To compare the experimental results to the frequency pattern on Twitter, Aegyo variants of target stems were made based only on their past-declarative forms ending with /-s’ʌ/. The same items were used in Jang (to appear).

A total of 66 Aegyo expressions ($\{s', t\epsilon', t'\} * \{\Lambda, j\Lambda\} * 11 \text{ stems}\}$) were presented in a semi-random order, in which there was no sequence of two Aegyo variants for the same stem. During the experiment that was carried out by computer, a single Aegyo expression was provided for each screen with a noun in a written form and participants were asked to rate the cuteness of the given expression as an Aegyo form of its original form as follows: How cute is $[siham \text{ } ma\eta h\epsilon t\epsilon'j\Lambda]$ as an Aegyo expression of $[siham \text{ } ma\eta h\epsilon s'\Lambda]$ ‘I screwed up my test’? By using a mouse, participants then clicked a number from 1 to 7 and pressed a “next” button to move on. Each experiment took about 20 minutes on average.

Table 3. Target items used in the rating experiment

Stem	Aegyo variants
teal.ha- ‘well done’	tealhēs'Λ, tealhēŋ'jΛ, tealhete'Λ, tealhete'jΛ, tealhet'Λ, tealhet'jΛ
maŋ.ha- ‘fail’	maŋhēs'Λ, maŋhēŋ'jΛ, maŋhete'Λ, maŋhete'jΛ, maŋhet'Λ, maŋhet'jΛ
nΛh- ‘insert’	nΛΛs'Λ, nΛΛŋ'jΛ, nΛΛte'Λ, nΛΛte'jΛ, nΛΛt'Λ, nΛΛt'jΛ
mΛk- ‘eat’	mΛkΛs'Λ, mΛkΛŋ'jΛ, mΛkΛte'Λ, mΛkΛte'jΛ, mΛkΛt'Λ, mΛkΛt'jΛ
ip- ‘wear’	ipΛs'Λ, ipΛŋ'jΛ, ipΛte'Λ, ipΛte'jΛ, ipΛt'Λ, ipΛt'jΛ
kΛt- ‘walk’	kΛlΛs'Λ, kΛlΛŋ'jΛ, kΛlΛte'Λ, kΛlΛte'jΛ, kΛlΛt'Λ, kΛlΛt'jΛ
tēu- ‘give’	tēwΛs'Λ, tēwΛŋ'jΛ, tēwΛte'Λ, tēwΛte'jΛ, tēwΛt'Λ, tēwΛt'jΛ
pat- ‘receive’	patas'Λ, pataf'jΛ, patate'Λ, patate'jΛ, patat'Λ, patat'jΛ
pok'- ‘pan fry’	pok'as'Λ, pok'af'jΛ, pok'ate'Λ, pok'ate'jΛ, pok'at'Λ, pok'at'jΛ
po- ‘see’	pwas'Λ, pwaŋ'jΛ, pwate'Λ, pwate'jΛ, pwat'Λ, pwat'jΛ
sa- ‘buy’	sas'Λ, saŋ'jΛ, sate'Λ, sate'jΛ, sat'Λ, sat'jΛ

The experiment took place from April 22 to May 8, 2019. Participants were recruited at social reading groups with people of various social backgrounds, ages, and genders. A total of 74 native Korean speakers (female 45, male 29) participated in the experiment. The mean age of the participants was 27.46 years. Forty-eight participants were under 31 years old at the point of the experiment (female 29, male 19) and twenty-six participants were over 31 years old (female 16, male 10). All participants voluntarily participated in the experiment. Before starting the experiment, participants were informed that the results of the experiment would be treated anonymously without revealing any personal identity.

3.2 Hypothesis and prediction

In addition to the three hypotheses in (9) which were presented in section 2.2, this section sets up new hypotheses for the experimental results. The third hypothesis reflects the proportion of Aegyo expressions that were used with cute emoticons (see Figure 3): [hete'Λ] (2%) > [hes'Λ] (3.55%), [het'Λ] (3.83%) > [hete'jΛ] (4.97%) > [het'jΛ] (18.75%) > [heŋ'jΛ] (20%).

- (9) Hypothesis 1. Iconic strength of Aegyo variants = the number of segmental alternation

Prediction for variants of /-s'Λ/: [-te'jΛ], [-t'jΛ] > [-te'Λ], [-t'Λ], [-ŋ'jΛ] > [-s'Λ]

- Hypothesis 2. Iconic strength of Aegyo variants = phonological naturalness of sequences

Prediction for variants of /-s'Λ/: [-te'jΛ] > [-te'Λ], [-t'Λ], [-ŋ'jΛ] > [-t'jΛ], [-s'Λ]

- Hypothesis 3. Iconic strength of Aegyo = the proportion of co-occurring cute emoticons

Prediction for variants of /-s'Λ/: [-te'Λ] > [-s'Λ], [-t'Λ] > [-te'jΛ] > [-t'jΛ] > [-ŋ'jΛ]

Assuming that the usage frequency on Twitter reflects the iconic strength of Aegyo expressions, it is predicted that Aegyo variants that are used more frequently in tweets will be evaluated as more cute. The prediction in (10) is the same as the frequency pattern of Aegyo variants on Twitter (see Figure 2).

- (10) Hypothesis 4. Iconic strength of Aegyo variants = their usage frequency in tweets
 Prediction for variants of /-s'ʌ/: [-tɕ'jʌ], [-t'ʌ] > [-s'ʌ] > [-tɕ'ʌ] > [-t'jʌ], [-ʃ'jʌ]

Cuteness is one of the most prominent gendered aspects of East Asian culture. Images of women in East Asia are associated with cuteness (Matsumoto 1996; Puzar 2011). The baby-talk register in East Asia, such as Mandarin Chinese *sajiao* and Japanese *amai koe* is also highly associated with the female gender (Farris 1988; Kinsella 1995; Hardeman 2013; Starr 2015). It is therefore predicted that women will be more sensitive to differences in the degree of cuteness of expression. In the experimental results, the difference in the rating value of Aegyo variants is expected to be greater in responses of female participants than in those of males.

- (11) Hypothesis 5.

The more culturally relevant the concept of cuteness is to a group of speakers, the greater the degree of sensitivity the speakers will demonstrate in distinguishing the iconic strength of Aegyo forms.

Prediction for the difference in the rating of Aegyo variants: female > male speakers

The function of baby-talk register is to strengthen the social relationship between addresser and addressee by temporarily setting up some sort of caregiver-caretaker relationship (Bombar & Littig 1996; Morris 2004; Shaver & Mikulincer 2006; Park 2010). The baby-talk register intentionally rejects the mature language in favor of childlike images of the addresser. For this reason, it is assumed that to create childlike images using linguistic methods, relatively older speakers should put more effort into changing their language that is originally required for use in their social status. Older speakers are then expected to be more sensitive to the degree of cuteness of the Aegyo register. Since in Korean society, both men and women start a career at around 30 years old and they are required to use mature language in professional contexts, the difference in the rating value of Aegyo variants is expected to be greater in responses of participants who are over 30 than from those of participants who are under 30.

(12) Hypothesis 6.

Speakers who experience greater social pressure to use mature language will demonstrate greater degree of sensitivity in distinguishing the iconic strength of Aegyo expressions.

Prediction for the difference in the rating of Aegyo variants: older > younger speakers

3.3 Results

3.3.1 Degree of cuteness

Figure 5 shows the cuteness-rating results of Aegyo variants of /-s'ʌ/ by their segmental alternation. The average cuteness rating value was the highest for the Aegyo variants with [-tɕ'jʌ] (3.9) and the lowest for the Aegyo variants with [-ʃ'jʌ] (2.6). The Aegyo variants are listed in the decremental order of the average cuteness rating values as follows: [-tɕ'jʌ] > [-t'ʌ] (3.7) > [-tɕ'ʌ] (3.56) > [-t'jʌ] (3.23) > [s'ʌ] (2.84) > [-ʃ'jʌ].

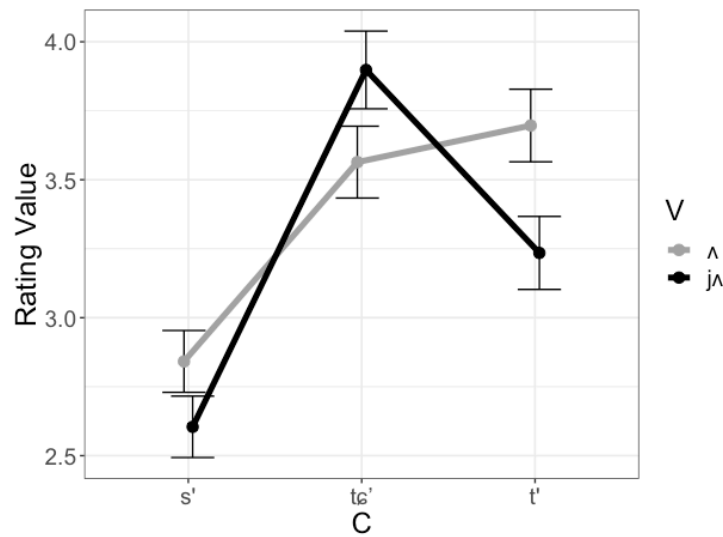


Figure 6. Cuteness rating of [-s'ʌ, -ʃ'jʌ, -tɕ'ʌ, -tɕ'jʌ, -t'ʌ, -t'jʌ] in Aegyo variants of /-s'ʌ/

Error bars represent the 95% confidence interval (CI). The 95% confidence interval is wider than the standard error. Since the sample size for each type of segmental alternation is equal, if two 95% CI error bars do not overlap, the difference is statistically significant with a P-value much less than 0.05 (Payton et al. 2003). In Figure 5, all of the CI error bars do not overlap, except for the pair of [-tɕ'jʌ] and [-t'ʌ] and the pair of [-t'ʌ] and [-tɕ'ʌ].

The significance of the rating results was tested using a linear mixed regression model with random intercept effect of participants and items. The lmer function in the lme4 package for R (Bates et al. 2012)

was used. In the linear mixed regression model, the difference between $[-t\epsilon'j\Lambda]$ and $[-t'\Lambda]$ in cuteness scores is significant with a P-value less than 0.0001. According to the model, the significant difference in the cuteness rating values for Aegyo variants can be summarized as follows: $[-t\epsilon'j\Lambda] > [-t'\Lambda] \sim [-t\epsilon'\Lambda] > [-t'j\Lambda] > [s'\Lambda] > [-j'\Lambda]$.

3.3.2 Sensitivity to the cuteness degree

3.3.2.1. By gender

Figure 7 shows the cuteness-rating results by gender of participants (45 females and 29 males). Overall, the female participants rated Aegyo expressions as cuter. The noticeable difference in rating patterns by gender is that female participants rated the cuteness of the $[-t\epsilon'j\Lambda]$ variants significantly higher than they did the $[-t\epsilon'\Lambda]$ and $[-t'\Lambda]$ variants. The average rating values were 4.26, 3.78, and 3.9, respectively. In the male participant response, the $[-t'\Lambda]$ variants were rated cuter than the $[-t\epsilon'j\Lambda]$ and $[-t\epsilon'\Lambda]$ variants and the rating values for those variants were not significantly different (3.38, 3.33, and 3.22, respectively). In the linear mixed regression model using gender and the variant type as independent variables with the random intercept effect of participants and items, the interaction effect between the gender and the variant type in the cuteness rating scores is significant with a P-value less than 0.0001 only in the contrast between $[-t\epsilon'j\Lambda]$ and $[-t\epsilon'\Lambda, -t'\Lambda]$.

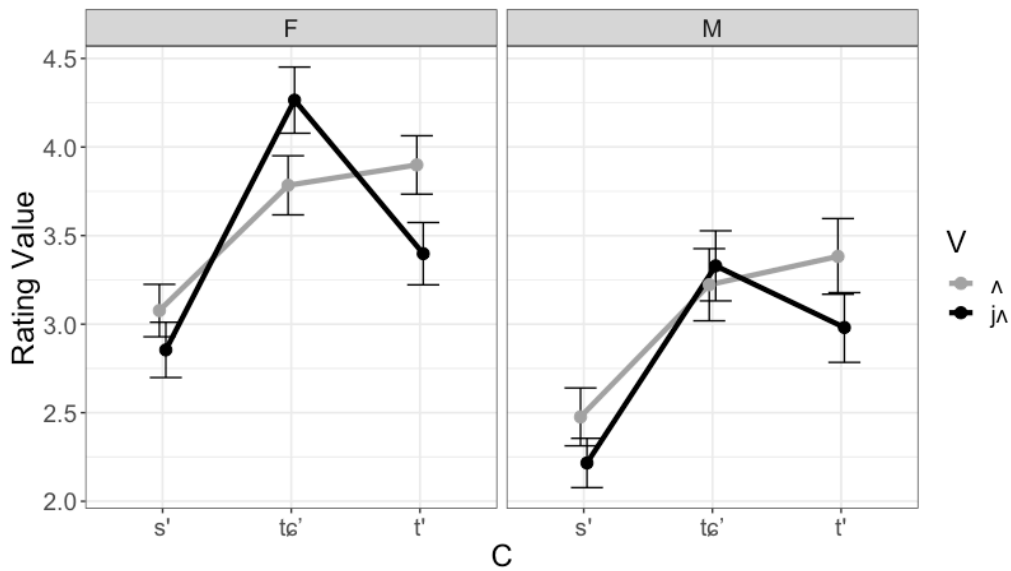


Figure 7. Cuteness rating of Aegyo variants of /-s'Λ/ by female participants vs. male participants

3.3.2.2. By age

Figure 8 shows the cuteness-rating results by age of participants (48 under 30 and 26 over 30). The two age groups show the same patterns of cuteness rating for Aegyo variants according to types of segmental alternation, but the participants older than 30 show a larger difference in rating scores between Aegyo variants.

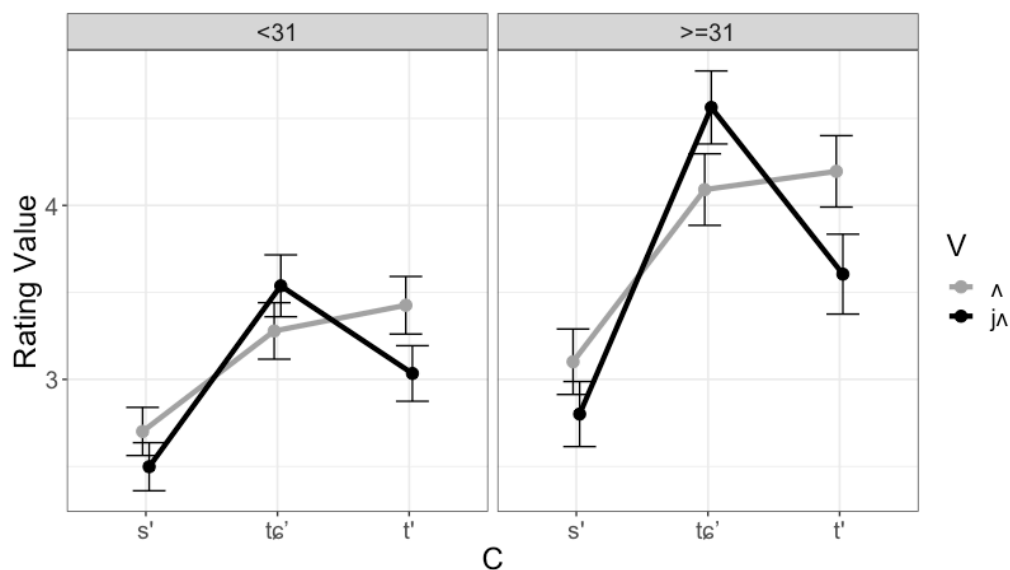


Figure 8. Cuteness rating of Aegyo variants of /-s'ʌ/ by participants who are over 30 vs. under 30

In the linear mixed regression model, which includes the age group and the variant type as independent variables with the random intercept effect of participants and items, the interaction effect between the age group and the variant type in the cuteness rating values is significant with a P-value less than 0.001 in the contrast between [s'ʌ] and [-j'jʌ] (in average, 2.7 and 2.5 respectively in the response of participants under 30; and 3.1 and 2.8 in over 30) and between [s'ʌ] and [-tɕ'ʌ, -t'ʌ] (2.7, 3.28, and 3.43 in under 30; and 3.1, 4.09, and 4.2 in over 30). The interaction effect between the age group and the variant type is also significant with a P-value less than 0.01 in the contrast between [-tɕ'jʌ] (3.54 in under 30; 4.56 in over 30) and [-tɕ'ʌ, -t'ʌ].

3.3.2.3. By gender and age

Figure 9 shows the cuteness-rating results by age and gender of participants. Among female participants, 29 participants were younger than 30 years old and 16 participants were older than 30. Among male participants, 19 participants were younger than 30 and 10 participants were older than 30. The female participants older than 30 (the upper right panel in Figure 9) show significantly larger differences in rating

scores between Aegyo variants in comparison to the female participants younger than 30 (the upper left panel in Figure 9): the contrasts between $[s'\Lambda]$ and $[-j'\Lambda]$ and between $[s'\Lambda]$ and $[-te'\Lambda, -t'\Lambda]$ ($p < 0.0001$) and the contrasts between $[-te'j\Lambda]$ and $[-te'\Lambda, -t'\Lambda]$ and between $[-t'j\Lambda]$ and $[-te'\Lambda, -t'\Lambda]$ ($p < 0.001$). The male participants older than 30 rated the $[-te'\Lambda]$ and $[-t'\Lambda]$ variants as significantly cuter than the $[s'\Lambda]$ variants ($p < 0.01$) in comparison to the male participants younger than 30.

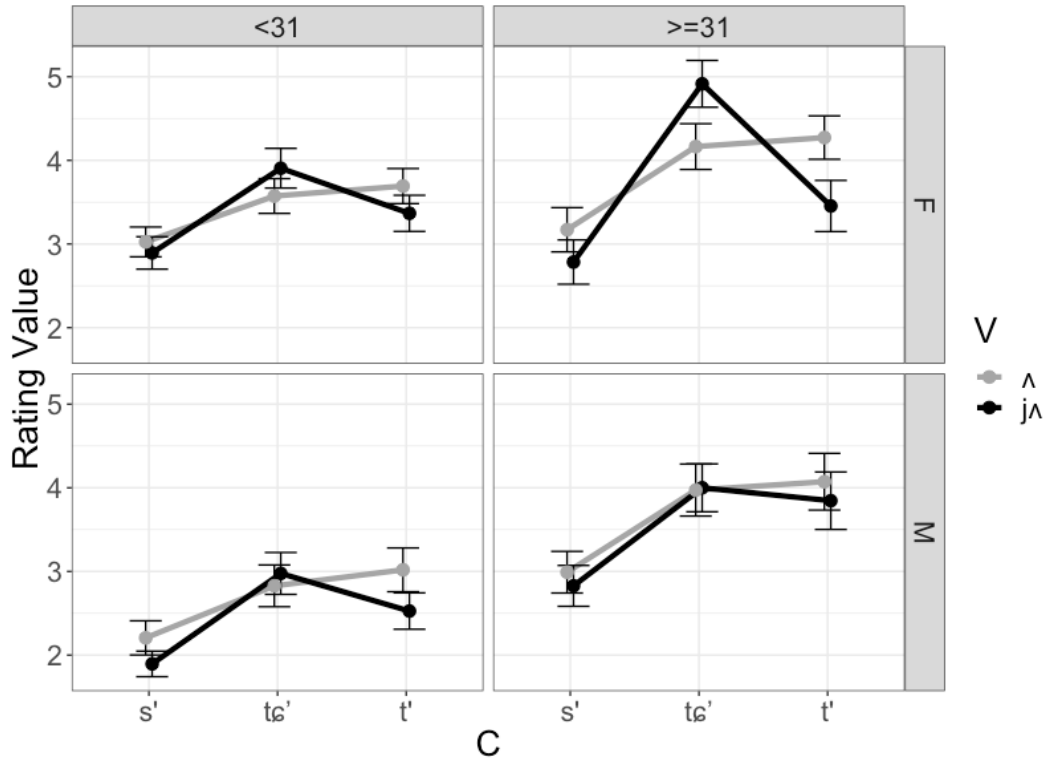


Figure 9. Cuteness rating of Aegyo variants of /-s'Λ/ by age and gender of participants

In the linear mixed regression model, which includes the age group, gender, and variant type as independent variables with the random intercept effect of participants and items, the interaction effects of all three independent variables are significant in the contrast between $[-t'j\Lambda]$ and $[-te'\Lambda, -t'\Lambda]$ with a P-value less than 0.001 and in the contrasts between $[s'\Lambda]$ and $[-j'\Lambda]$ and between $[-te'j\Lambda]$ and $[-te'\Lambda, -t'\Lambda]$, with a P-value less than 0.01. As shown in Figure 9, the pattern of cuteness scores for Aegyo variants is distinct in the responses of the female participants older than 30 compared to those of other groups of participants: $[-te'j\Lambda]$ (the average cuteness score 4.91) $> [-t'\Lambda]$ (4.27) $\sim [-te'\Lambda]$ (4.16) $> [-t'j\Lambda]$ (3.46) $\sim [s'\Lambda]$ (3.17) $> [-j'\Lambda]$ (2.78).

3.4 Implications

The cuteness scores for Aegyo variants support the phonological naturalness hypothesis except for the lowest score for the $[-\text{ʃ}^{\text{h}}\text{j}\Lambda]$ variants: $[-\text{te}^{\text{h}}\text{j}\Lambda] > [-\text{t}^{\text{h}}\Lambda] \sim [-\text{te}^{\text{h}}\Lambda] > [-\text{t}^{\text{h}}\text{j}\Lambda] > [\text{s}^{\text{h}}\Lambda] > [-\text{ʃ}^{\text{h}}\text{j}\Lambda]$. The $[-\text{ʃ}^{\text{h}}\text{j}\Lambda]$ variants were the least frequently used in Twitter and the co-occurring proportion of cute emoticons were the highest with the type of variants. However, those cannot explain the lowest cuteness score for the $[-\text{ʃ}^{\text{h}}\text{j}\Lambda]$ variants because the $[-\text{t}^{\text{h}}\text{j}\Lambda]$ variants got relatively high cuteness score even with the lowest frequency and a high co-occurring proportion of cute emoticons. The lowest cuteness score of the $[-\text{ʃ}^{\text{h}}\text{j}\Lambda]$ variants seems to be due to the unnaturalness of the pronunciation of the target sequence at the end of the sentence. Many participants commented that the $[-\text{ʃ}^{\text{h}}\text{j}\Lambda]$ and $[-\text{t}^{\text{h}}\text{j}\Lambda]$ variants sounded very unnatural and hard to pronounce. Although participants thought that the pronunciation of $[-\text{t}^{\text{h}}\text{j}\Lambda]$ was also unnatural, the cuteness score of the $[-\text{t}^{\text{h}}\text{j}\Lambda]$ variants was higher than that for the $[\text{s}^{\text{h}}\Lambda]$ variants. This indicates that the consonantal alternation from $/\text{s}^{\text{h}}/$ to $/\text{t}^{\text{h}}/$ contributes to the iconic strength of Aegyo expressions. The $[-\text{te}^{\text{h}}\text{j}\Lambda]$ variants that include a phonologically natural sequence made by two segmental alternations for the Aegyo register got the highest cuteness score.

The experimental results show that females are more sensitive than are males and older speakers are more sensitive than younger ones to the difference in degrees of cuteness among Aegyo variants. The female participants over the age of 30 were the most sensitive. These results support both the fifth and sixth hypotheses in 3.2 that are based on the gender aspects of cuteness and the function of the Aegyo register. The major function of baby-talk register is to sound cute like children to set up a temporal caregiver-caretaker relationship. To use the special register, adult speakers must intentionally avoid the characteristics of mature language appropriate to age and social status. Cuteness is highly associated with the female gender. Indeed, male participants, regardless of age, commented that they were often reluctant to pronounce Aegyo expressions during experiments and that they never used such expressions.

4. Discussion

In order to deliver the message efficiently, which is the main function of language, it is very important to use a speech register appropriate for the relationship between the addresser and the addressee. In addition to the expected use of registers in relations that are already socially and personally determined, the use of speech registers also serves to establish a new relationship between the addresser and the addressee by assigning a special persona to the addresser. The baby-talk register used among adults gives the addresser a childlike persona to indirectly seek unconditional affection, acceptance and mental support from the addressee that are expected in the relationship between the child and the caregiver.

Studies of the baby-talk register have tended to focus on suprasegmental cues of the register: high pitch and a breathy voice in the sweet voice of Japanese; a high pitched and creaky voice[†] in Mandarin Sajaio; and extreme contour and phrase-final LHL% in Aegyo in Korean (Starr 2015; Hardeman 2013; Moon 2017). This paper is a study of segmental alternation that has not been dealt with much in the past. Through investigating Korean Aegyo data, we identify various segmental alternations besides expressive palatalization that are used as linguistic strategies for the baby-talk register.

The affrication of fricatives is a common type of segmental alternation observed in many languages' smallness-related expressions such as diminutives and the baby-talk register (Alderete & Kochetov 2017). In particular, in diminutives of Island Lake Ojibwa and the babytalk of Japanese, an alveolar fricative /s/ could shift to either a palatal fricative [ʃ] or a palatal affricate [tʃ] as in (13) and the shift to affricates is considered to have a greater degree of diminution and babyishness (Chew 1969; Shrofel 1981).

- (13) a. Island Lake Ojibwa diminutives
 [ʃi:hʃi:p-enihs] → [ʃi:hʃi:pe:nhʃ] ~ [tʃi:hʃi:pe:nhʃ] ‘little duck’
 b. Japanese babytalk
 [tabemasuka] → [tabemaʃuka] ~ [tabematʃuka] ‘will you eat?’

Since fricatives never become affricates in phonological palatalization, Alderate and Kochetov (2017) explain the affrication of fricatives as in (13) as a result of the action of a register-specific constraint EXPRESS[AFFRICATE]. The motivations for the expressive constraint are the sound-symbolic associations between the concept of smallness and the acoustic aspects of affricates such as an intense strident noise and high F2 (Ohala 1994; Kochetov & Alderate 2011).

In Korean, however, especially the tensed fricative /s'/ that is alternated to affricates or stops in the Aegyo register has an intense strident noise as shown in Figure 10. The frequency range of the frication noise of /s'/ in (b) of Figure 10 is higher than that of the tensed affricate /tɕ'/ in (c).

[†] It has been reported that creaky voice is also associated with sexiness and femininity (Kajino & Moon 2011).

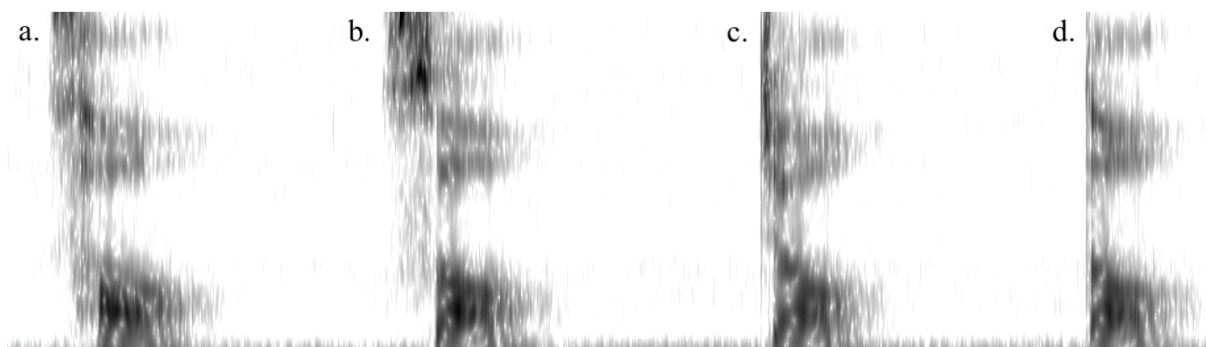


Figure 10. Spectrogram of a. [sʌ], b. [s'ʌ], c. [tɕ'ʌ], and d. [t'ʌ]

In addition, stopping of fricatives in Korean Aegyo cannot be explained by the acoustic motivation of affrication. As shown in (d) of Figure 10, there is no strident noise in the stop and the starting point of F2 transition from stops to the following vowel is not as high as that from affricates to the same vowel in (c). The fact that the [-t'ʌ] Aegyo variants received slightly higher cuteness ratings than did the [-tɕ'ʌ] variants suggests that we need to reconsider the phonetic motivation of segmental alternation as an expressive strategy. In particular, the role of phonological naturalness in both the usage frequency of Aegyo expressions in Twitter and the cuteness rating of Aegyo expressions suggests that language-specific phonology such as phoneme structure and phonological constraints should be considered even in a register-specific grammar. This is in line with the argument of Alderete and Kochetov (2017) that a register-specific grammar as a grammatical extension must be integrated with the core grammar. Acoustic analysis of Aegyo variants will be covered in the follow-up studies.

The current study showed differences in sensitivity to the degree of cuteness of Aegyo variants according to the gender and the age of Korean speakers. The overall pattern of cuteness ratings was the same, but female participants over the age of 30 perceived greater differences in the degree of cuteness between the variants that are made by different types of segmental alternation. This suggests that if speakers rely more heavily on the function of the Aegyo register, then they use a larger scale factor in constraints about the iconic strength of Aegyo expressions. A scale factor is a constant of proportionality between two objects. In the constraint-grammar frameworks of phonology, the grammar of a language is determined by the language-specific ranking or weights of universal constraints (Legendre et al. 1990; Prince & Smolensky 1993; McCarthy & Prince 1995; Smolensky & Legendre 2006). Assuming that users of the language share the same ranking of constraints, and that a register-specific constraint occupies a fixed position in the ranking, the scale factor plays a role in determining the spacing between constraints. There are already studies that introduce scale factors into computation in phonological grammar (Hsu & Jesney 2016, 2017, 2018; Hsu 2019). This paper shows that a scale factor can be applied to language-

specific constraints and that the application of the scale factor can be limited to a certain type of speakers by the function of the speech register.

5. Conclusion

This paper addresses questions about the relationship between the iconic strength of Aegyo expressions and types of segmental alternation as expressive strategies, which had not received much attention in studies on speech registers. The results of the usage frequency analysis on Twitter and the cuteness-rating experiment show that the phonological naturalness of the sound sequence resulting from the alternations in Aegyo register determines the preference for and the degree of cuteness of Aegyo expressions. The results also show that female speakers over the age of 30 are more sensitive to the difference in cuteness of Aegyo expressions, depending on the segmental alternation used in the expressions, than are younger and/or male speakers.

Jakobson (1960) argues that language must be investigated in all the variety of its functions. This study shows that the language-specific phonological constraints interact with the register-specific constraints. Even in a speech register with the same function, different strategies can be used depending on the grammatical structure of each language. This suggests that a special language code called the speech register provides a good resource for studying both suprasegmental and segmental aspects of the expansion of language grammars by the interaction of various functions of language.

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