Linguistic Research 43(1): 257-294
DOI: 10.17250/khisli.43.1.202603.010

Operationalizing listener sensitivity: Bridging sociophonetic perception and social meaning in Korean aegyo*

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Crosby, Drew, Amanda Dalola, and Rok Sim. 2026. Operationalizing listener sensitivity: Bridging sociophonetic perception and social meaning in Korean aegyo. *Linguistic Research* 43(1): 257-294. In sociophonetics and laboratory phonology, researchers often invoke "listener sensitivity," meaning that some individuals or groups notice and differentiate fine-grained phonetic variation more than others, yet this construct is rarely operationalized as a single gradient measure. We introduce a simple, generalizable metric, the sensitivity score, defined as the sum of absolute differences between a participant's mean ratings across all unordered pairs of variants. We demonstrate the metric using a perception experiment on Korean aegyo, a cuteness-indexed register with segmental alternations including nasal insertion, /j/-insertion, and vowel rounding. Forty-three native Korean listeners rated 90 spoken stimuli each (15 variants × 6 predicates; 3870 ratings total), produced by two talkers, on a 1–7 aegyofulness scale. We analyze the token-level ratings with a linear mixed-effects model comparable to Jang (2021) and analyze sensitivity scores computed within each predicate (six scores per participant; 258 scores total) with a second mixed-effects model. The token-level model replicates broad social patterning in aegyo evaluations, while the sensitivity score provides a transparent participant- and item-level summary of overall differentiation. Women show higher sensitivity than men, and age shows a trend, such that younger listeners show higher sensitivity than older listeners. Aggregating ratings into sensitivity scores reduces the number of observations relative to token-level modeling, so we treat the metric as complementary to traditional statistical methods. Beyond aegyo, the approach is portable to other sociophonetic, prosodic, and sound-symbolic domains. **(Korea University · University of Minnesota · University of South Carolina)**

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* We sincerely thank our participants for their time and cooperation, as well as two anonymous reviewers for their insightful feedback. Any remaining errors are our own.
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Keywords sociophonetics, speech perception, listener sensitivity, sensitivity score, aegyo, baby-talk register, phonetic variation

1. Introduction

In many laboratory phonology and sociophonetic studies, sensitivity to linguistic phenomena or related concepts is often invoked but rarely given a formal, gradient operationalization (Gerken et al. 1994; Niedzielski 1999; Hay et al. 2006; Labov et al. 2006; Mo et al. 2008; Moon 2017; Jang 2021; Sim and Crosby 2025). By sensitivity, researchers usually mean that a given individual/group notices some linguistic feature or shows greater differentiation between two or more linguistic forms than other individuals/groups. This understanding can be seen in work such as Niedzielski (1999), who showed that Detroit listeners were more or less attuned to vowel realizations depending on their expectations of whether the speaker was from the U.S. (Detroit) or Canada (Windsor), and Campbell-Kibler (2006, 2009), who found that consonantal differences were differentially attended to across listeners. Similarly, Moon (2017) demonstrated that young Seoul women deploy and attend to variables at phrase boundaries, especially IP-final tones and vowel raising, as resources for indexing stance and persona.[1] Jang (2021) made this notion explicit, describing older women as more sensitive to aegyo alternations, though her operationalization of sensitivity relied on indirect evidence, specifically, the presence of significant higher-order interactions in regression models, interpreted alongside plotted group means, rather than through a direct quantitative measure.

Across this diverse body of work, from infants' detection of prosodic phrasing (Gerken et al. 1994) to listeners' attunement to socially conditioned variation in vowels, consonants, and prosody (Niedzielski 1999; Campbell-Kibler 2006, 2009; Hay et al. 2006; Labov et al. 2006; Mo et al. 2008; Moon 2017; Jang 2021), "sensitivity" is

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1 'Stance' and 'persona' are central concepts in sociolinguistic theory. Stance refers to the positioning of a speaker's thoughts and feelings toward their interlocutor(s) and/or the topic under discussion (Wardhaugh and Fuller 2015). Persona refers to "holistic, ideologized character types" that are recognizable within a community and are "sometimes even explicitly labelled" (D'Onofrio 2019: 347), such as the 꽃미남 /k*otɕʰminam/ 'flower boy' (Jung 2011) or the valley girl (D'Onofrio 2015). The term index and the process of indexicality refers to associating a linguistic form and a social meaning (Wardhaugh and Fuller 2015: 407). For example, in some U.S. contexts, a backed realization of /æ/ can index a valley girl persona, i.e., it can signal a temporary adoption of that social style.

consistently invoked as an explanatory notion. However, in each case it remains descriptive, whether framed as noticing, differentiating, or attending to variation, rather than given a general, gradient operationalization. This gap motivates our proposal for a simple, generalizable metric: the sensitivity score, which we demonstrate using perceptual data from Korean aegyo, the baby-talk register of Korean, where listeners have been argued to display varying degrees of sensitivity to its many phonological forms.[2]

This paper is organized as follows. Section 2 reviews prior work and motivates the sensitivity score. Section 3 describes the methods and analyses. Section 4 presents results for token-level aegyofulness ratings and sensitivity scores. Section 5 discusses implications and links the findings to prior work. Section 6 concludes with limitations and future directions.

2. Literature review and research questions

2.1 Social meaning

It is well established that speech sounds function not only to distinguish semantic and pragmatic meaning but also to convey social meaning. One of the earliest studies illustrating this was Labov (1963), which reported that speakers on Martha's Vineyard with more raised nuclei in the vowels /ai/ and /au/, a feature appropriated from local fishermen, had more positive feelings toward the island and expressed stronger resistance to summer visitors than those with lower nuclei. Work following Labov (1963) focused on connecting sociolinguistic variables with large-scale, researcher-defined (or etic) demographic categories such as gender, ethnicity and socioeconomic status in a variety of urban communities such as New York (Labov 1966), Norwich, England (Trudgill 1972), the African-American community of Detroit (Wolfram 1969), Paris (Faygal and Moisset 1999), and Jeonju (Ahn 1987). In the

2 Throughout this paper, we use "sensitivity" in two related but distinct senses. First, we use perceptual "sensitivity" in the descriptive sense common in sociophonetics: the degree to which listeners notice, attend to, or differentiate between linguistic forms. Second, we introduce the "sensitivity score" as a formal metric that operationalizes this perceptual differentiation quantitatively at the participant level. The sensitivity score is thus not a theoretical redefinition of sensitivity, but a method for measuring a construct that has long been invoked descriptively in prior work.

process of explaining the distribution of sociolinguistic variables and language change, researchers examined both interspeaker variation and intraspeaker variation. Intraspeaker variation or 'style-shifting' was conceptualized as a continuum of 'attention to speech' or how closely a speaker was monitoring their speech depending on the activity they were performing (Labov 1966). Tasks in which participants were focused more on the form of their speech, such as reading word lists or minimal pair readings, were shown to produce more standard variants than those where participants were more focused on the message, such as open-ended interview questions. This approach to variationist studies is what Eckert (2012) refers to as the "first-wave" of sociolinguistics. This eventually developed into "the second-wave" of sociolinguistics, which instead focused on variation among locally-defined (or emic) categories, such as the use of the Northern Cities chain shift among the Jock and Burnout high school cliques in Eckert (1988), and the employment of vernacular variables among locally constructed social networks (Milroy 1987).

Building on this, the "third wave" treats variation as a system of indexical resources that speakers deploy to construct personae, stances, and styles in interaction (Eckert 2012). Rather than viewing social meaning as passively attached to demographic identity, third-wave work emphasizes how speakers actively mobilize variants to project social positioning in context. For example, Zhang (2005) shows that Beijing professionals in foreign-sector workplaces draw on supralocal resources (alongside avoidance of locally enregistered Beijing features) in ways that support a cosmopolitan professional persona, including topic-sensitive shifts tied to professional talk. Likewise, Pratt (2018) shows how students in a U.S. arts high school use clusters of phonetic resources (e.g., creaky voice and speech rate) to build affective styles such as "chill" versus "loud," which are linked to stancetaking and orientation to the institution.

This perspective is especially relevant for Korean aegyo, where listeners' evaluations of phonetic alternations are plausibly shaped by the social meanings those alternations evoke (e.g., intimacy, playfulness, irony, and sincerity). Aegyo therefore provides a particularly clear case where perceptual differentiation across variants can be interpreted as sensitivity not merely to "sound" but to socially meaningful stylistic cues.

2.2 Aegyo

2.2.1 Defining aegyo as a speech style

Aegyo (애교, 愛嬌) is a widely recognized Korean style of "performed winsomeness" (Puzar and Hong 2018) that combines linguistic, prosodic, and gestural resources to produce the impression of child-like cuteness. It is most salient in intimate or playful contexts, romantic interactions, persuasive requests, and peer exchanges.

However, evaluations of aegyo are often ambivalent. It is largely judged positively as playful, affectionate, or intimate, but there are also negative evaluations of it as manipulative, childish, or inauthentic (Moon 2013; Brown 2017; Crosby and Dalola 2023). This evaluative tension underscores aegyo's indexical flexibility: it can simultaneously be read as sincere or strategic, warm or fake.

Aegyo is also highly associated with women and younger speakers (Moon 2013; Strong 2013; Han 2016; Brown 2017; Puzar and Hong 2018; Kim 2022; Crosby 2023). Women are expected to perform it more frequently, and although men are more likely to be sanctioned for using it (Puzar and Hong 2018), they do employ it, particularly in mediated contexts such as K-pop, where it forms part of what scholars describe as soft masculinity; a type of masculinity that employs features traditionally associated with femininity such as gentleness and politeness and that contrasts with other kinds of Korean masculinity (Jung 2011; Manietta 2015). In boy-group "aegyo contests," for example, male idols momentarily adopt cute facial expressions, aegyo vocal features, and engage in child-like performances to display a feminized charm that has become a recognizable component of many idols' personae (Manietta 2015).[3]

2.2.2 Phonetic and phonological correlates

Linguistically, aegyo is characterized by baby-talk lexical items, address terms, and a wide variety of phonetic and phonological alterations (Strong 2012; Moon 2013, 2017; Kim 2020; Jang 2021; Crosby 2023; Crosby and Dalola 2023; Holliday and Kong 2025; Kim and Dellwo 2025).

3 See Manietta (2015) for a detailed (conversation) analysis of male idols' performance of aegyo and Han (2016) for an analysis of the aesthetics of male aegyo.

In terms of phonetic/phonological changes, studies consistently identify nasality, obstruent fortition, and prosodic modulation as central to aegyo. Nasality appears both as epenthetic nasal consonants (ENCs) and vowel nasalization, typically at the end of an IP, and serves as a politeness marker, conversational softener, and an index of affection (Crosby 2023). Obstruent fortition, where fricatives and affricates are realized as stops or affricates, indexes intimacy and romantic stance (Crosby and Dalola 2023). Prosodic stylization, including exaggerated pitch contours and IP-final tones such as LH% or LHL%, is also indicative of aegyo (Strong 2012; Moon 2013; Kim 2020; Kim and Dellwo 2025). They can signal a range of aegyo personae, such as gentleness or childishness, depending on the precise prosodic realization (Moon 2017).

An example of all three of these can be seen by comparing (1) and (2) where aegyo correlates are bolded and underlined. Both examples come from Crosby's (2026) experiment asking participants to request something of their romantic partner in non-aegyo (1) and aegyo (2). In the case of nasality, no ENCs or unexpectedly nasalized vowels are seen in (1), whereas in (2) an ENC (realized as /ŋ/) is attached to the end of each IP. In the case of obstruent fortition, 사주면 /satɕu-mjʌn/ 'buy-COND' in (2) is realized with both the fricative /s/ and the affricate /tɕ/ being fortified to stops (they also undergo tensing, another, though less often identified, correlate of aegyo), whereas in (1) both consonants are realized as their canonical form. Finally, the utterance-final IP in (2) is realized as the more aegyoful LH%, while in (1) it is realized with the more standard question boundary tone H% (Crosby 2026).[4]

(1)	오빠	나	저녁에	스파게티
	oppa	me	dinner	spaghetti
	/$_{IP}$ op*a L%/	/$_{IP}$ na LH%/	/$_{IP}$ tɕʌnjʌkɛ LH%/	/$_{IP}$ sɯpʰakɛtʰi L%/
	[$_{IP}$ op*a L%]	[$_{IP}$ na LH%]	[$_{IP}$ tɕʌnjʌgɛ LH%]	[$_{IP}$ sɯpʰagɛtʰi L%]

사주면	안	돼?	
buy-COND	not	okay	
/$_{IP}$ satɕu-mjʌn	an	twɛ	H%/
[$_{IP}$ sadʑu-mjʌn	an	dwɛ	H%]

'Oppa, would you buy me spaghetti for dinner?'

4 Abbreviations in glosses are as follows: COND = conditional; POLITE = polite sentence-final marker; CONN = connective ending.

(2)

오빠	나	갖고	싶은	가방	있는데.
oppa	me	have	want	bag	exists-CONN
/$_{\text{IP}}$ op*a L%/	/$_{\text{IP}}$ na	katɕko	sipʰɯn	kapaŋ	is*-nɯntɛ L%]
[$_{\text{IP}}$ op*aŋ L%]	[$_{\text{IP}}$ na	kat̚k*o	ɕipʰɯn	kabaŋ	in-nɯndɛŋ L%]

그거	사주면	안	돼-요?	
that	buy-COND	not	okay-POLITE	
/$_{\text{IP}}$ kɯkʌ	satɕu-mjʌn	an	twɛ-jo	H%/
[$_{\text{IP}}$ kɯgʌ	t*at*u-mʌn	an	twɛ-joŋ	LH%]

‘Oppa, I have a bag I want. Would you buy it for me?’

These correlates align aegyo with other East Asian semiotic practices of cuteness, such as Japanese burikko (Miller 2004) and Chinese sajiao (Hardeman 2013; Yang 2023). Together, they demonstrate how cuteness is constructed through fine-grained phonetic detail, phonological alternations, and prosodic modulation.

2.2.3 Hyeo-jjalbun sori “Short-tongue sounds”

One of the most recognizable phonological features of aegyo is hyeo-jjalbun sori (HJS) ‘short-tongue sounds’.[5] These alternations include stopping, affrication, epenthetic nasal consonant (ENC) insertion, /ʌ/-rounding, and /j/-insertion.[6] For example, the predicate 잘했어 /tɕal.hæs*.ʌ/ “(you) did well” can be pronounced in HJS by stopping its /s*/ to a /t*/ becoming 잘해떠 (/tɕal.hæ.t*ʌ/). Alternatively, the /s*/ can be affricated to a /tɕ*/ yielding 잘해쩌 (/tɕal.hæ.tɕ*ʌ/). /ŋ/ can be inserted at the end of the word giving 잘해썽 (/tɕal.h æ.s*ʌŋ/). /ʌ/ can be rounded to /o/ forming 잘해쏘 (/tɕal.hæ.s*o/), and finally, a /j/ can be inserted after the /s*/ yielding 잘해쎠 (/tɕal.ha.s*jʌ/). These examples of HJS are given in Table 1.

5 The term ‘short-tongue sounds’ is a metalinguistic label used in popular discourse to describe the sort of consonant alternations associated with aegyo and speech produced by children (Moon 2013; Jang 2021; Holliday and Kong 2025). It can be broadly characterized by shifts in canonical obstruent pronunciations, although the exact list is author dependent, perhaps because it is not a literal articulatory characterization and instead a folk linguistic label.

6 The exact boundaries of HJS are debated, and ENC-insertion and /ʌ/-rounding are not typically identified as such either by scholars or the general public (Holliday and Kong 2025). However, we include them in the list following Jang (2021) because we use them in our experiment described below.

Table 1. Examples of HJS for the predicate 잘했어 /tɕalhæs*ʌ/

HJS Alternation	Korean	IPA
Stopping	잘해떠	/tɕal.hæ.t*ʌ/
Affrication	잘해쩌	/tɕal.hæ.tɕ*ʌ/
ENC-insertion	잘해썽	/tɕal.hæ.s*ʌŋ/
/ʌ/-rounding	잘해쏘	/tɕal.hæ.s*o/
/j/-insertion	잘해쎠	/tɕal.hæ.s*jʌ/

These alternations may also co-occur, yielding complex forms such as 잘해뚕 (/tɕal.hæ.t*joŋ/) with four alternations, as in Table 2.

Table 2. Examples of HJS forms with multiple alternations for the predicate 잘했어 /tɕalhæs*ʌ/

Number of Alternations	HJS Alternation	Korean	IPA
0	Standard	잘했어	/tɕal.hæs*.ʌ/
1	Stopping	잘해떠	/tɕal.hæ.t*ʌ/
2	Stopping + /j/-insertion	잘해뗘	/tɕal.hæ.t*jʌ/
3	Stopping + /j/-insertion + ENC-insertion	잘해뗭	/tɕal.hæ.t*jʌŋ/
4	Stopping + /j/-insertion + ENC-insertion + /ʌ/-rounding	잘해뚕	/tɕal.hæ.t*joŋ/

Crosby and Dalola (2023) show that obstruent fortition occurs more often in aegyo and is favored by women and younger speakers, arguing that it indexes romantic intimacy. Jang (2021), using Twitter data and perception experiments, finds that affrication + /j/-insertion is both the most common and the most highly rated for "cuteness." Her cuteness rating task revealed a perceptual hierarchy of HJS alternations, suggesting that not all alternations contribute equally to the aegyo register. Furthermore, she finds that women give marginally significantly higher ratings (p = .051) than men while older speakers give significantly higher ratings (p = .044) than younger speakers. Her study is significant to our understanding of aegyo specifically, baby talk registers generally, and sociolinguistic perception broadly, in that it shows that even among variants that are largely considered elements of the same phenomenon (aegyo / HJS) percepts differ greatly not only for the elements themselves but between different speakers. Furthermore, the by-speaker percepts are not in the direction that prior knowledge of aegyo would lead one to believe (i.e., that young women as the main users of aegyo should give higher ratings) which Jang (2021) explains elegantly using social background information and the findings of prior sociological and psychological research.

2.2.4 Broader cultural and methodological implications

The fact that aegyo's social meanings are mediated through fine-grained phonetic alternations makes it an ideal testbed for studies of listener sensitivity to sociophonetic variation (Moon 2017; Jang 2021). Perception studies of aegyo not only clarify how "cute" stances are socially evaluated, but also provide methodological tools for examining how listeners attend to subtle phonetic variation in socially meaningful ways.

In sum, the previous literature demonstrates that aegyo is a multimodal register of performed cuteness, blending linguistic, prosodic, and embodied features (Moon 2013, 2017; Strong 2013; Han 2016; Brown 2017; Puzar and Hong 2018; Kim 2020; Crosby 2023; Crosby and Dalola 2023). Socially, it functions as both an intimate and persuasive strategy, while evaluations remain ambivalent, shaped by gender ideologies and expectations (Park 2010; Puzar and Hong 2018; Jang 2021; Crosby and Dalola 2023). Phonetic research highlights nasality, obstruent fortition, and prosody as defining resources within aegyo, and the variety of aegyo-linked alternations and phonetic features makes it a methodologically rich domain for studying listener sensitivity to socially meaningful sociophonetic variation.

However, much prior work identifies aegyo's phonetic/phonological cues and social meanings through production patterns, discourse interpretation, or descriptive perceptual hierarchies, but it rarely quantifies, at the individual listener level, how strongly listeners differentiate among multiple aegyo variants in a way that is comparable across studies. When perception studies do address group differences, "sensitivity" is often inferred indirectly from select pairwise contrasts, plotted means, or higher-order interactions, which can make it difficult to summarize overall differentiation and to compare across datasets with different variant inventories. This motivates the present paper's focus on a portable operationalization of sensitivity as overall perceptual differentiation, rather than a patchwork of contrast-specific effects.

2.3 Aegyo and sensitivity

The most notable study to attempt an examination of listener sensitivity to aegyo forms is Jang (2021), who introduces the concept of sensitivity to aegyo forms, which she defines "as the difference in the rating scores between aegyo variants" (p. 11).[7] On the basis of her analyses, she argues that women and younger speakers (under 31 years of age) are more sensitive to aegyo forms and that older (≥31) women are the most sensitive overall. She then suggests that women are more sensitive to aegyo than men because they are more likely to use aegyo. She further proposes that older speakers (≥31) are more sensitive to aegyo because they are more likely to need to set up a pseudo care-giver-care-receiver relationship and because aegyo differs more markedly from the mature language of older speakers than it does from the language used by younger speakers. Further, she proposes that older (≥31) women may be more sensitive to aegyo than other groups because some aegyo-associated vowel realizations overlap with pronunciation patterns reported for older female speakers. Citing Yang (2017), she notes that women in their 30s and 40s tend to realize sentence-final /-jo/ (-요) as [-jʌ] (-여), and argues that because /-jo/→[-jʌ] is itself used as an aegyo resource (e.g., 했어요 [hɛsʌjo] → 했어여 [hɛsʌjʌ]), such overlap may "make the speakers more sensitive to the relative expressive strength" of aegyo alternations (Jang 2021: 15).

Jang (2021) provides one of the most detailed accounts to date of how Korean listeners evaluate multiple aegyo variants, showing that alternations differ systematically in perceived cuteness and that these evaluations pattern by listener gender and age. This kind of fine-grained, contrast-specific analysis is essential as a first pass for mapping the perceptual landscape of a complex, multi-cue register like aegyo. Our study builds on that foundation by proposing a complementary shorthand operationalization of sensitivity that summarizes overall differentiation

7 More recently, Kim and Dellwo (2025) also examine aegyo 'sensitivity,' but rather than looking at 'sensitivity' in our sense (as the differentiation in how aegyoful an alternation sounds), they examine sensitivity in terms of participant accuracy in identifying aegyo speech. Specifically, they use the measure A' from Signal Detection Theory which measures participants' accuracy in detecting a signal (in this case whether a token of speech is aegyo). They find that participants are extremely accurate at detecting aegyo speech, but are less accurate at detecting men's aegyo than they are at detecting women's aegyo, demonstrating that aegyo is both highly recognizable and that this recognition is mediated by gender.

among variants in a single, comparable value.

That said, Jang (2021) does not quantify sensitivity as a unified dependent variable. Instead, sensitivity is inferred indirectly from significant two- and three-way interactions among variant type, age group, and gender, together with inspection of plotted group means. While such interaction structures can reveal that groups differ in how strongly they separate particular contrasts, the pattern is not necessarily uniform across alternations. As a result, conclusions such as "female participants over the age of 30 were the most sensitive" (Jang 2021: 15) may reflect an aggregate impression across multiple contrasts rather than a single, directly estimated magnitude of differentiation.

This interpretive difficulty reflects a broader methodological issue: without a standardized metric, sensitivity must be reconstructed case-by-case from a patchwork of contrast-specific effects, which complicates comparisons across groups, datasets, and studies, and can invite impressionistic inference. By collapsing pairwise differences into a single sensitivity score, our approach provides a transparent and reproducible summary of overall responsiveness. The score is intended to complement, not replace, token-level mixed-effects modeling. Token-level mixed-effects models remain necessary for identifying which contrasts drive group differences, while the sensitivity score facilitates direct comparison of the overall degree of differentiation across listener groups and contexts.

2.4 The sensitivity metric

Jang's (2021) work is especially valuable beyond aegyo in that it demonstrates that variants treated as part of the same register can differ sharply in terms of listener perception (here perceived cuteness) and in that it offers a substantive interpretation of how these percepts pattern by gender and age. Building on this foundation, the present study targets a narrower methodological question, namely how to summarize listener sensitivity, understood as the degree of differentiation among variants, in a way that is transparent at the participant level and comparable across studies.

In Jang's (2021) analysis, sensitivity is inferred indirectly from higher-order interactions and the patterning of group means. This approach is informative for identifying which contrasts differ by social group, but it does not yield a single, directly estimated magnitude of overall differentiation that can be compared across groups, stimuli sets, or studies. The sensitivity score proposed here is designed to address that reporting and comparability problem. It collapses pairwise differences among a participant's mean ratings into a single summary value while retaining mixed-effects modeling as the primary tool for testing which contrasts and which social factors drive the observed differences.

2.4.1 Perceptual distance and listener differentiation

Research on perceptual distance in sociophonetics and speech perception spans several methodological traditions that each operationalize differentiation in different ways. Signal detection theory quantifies discriminability and response bias in categorical perception and is typically applied to tasks such as same-different or forced choice paradigms (Green and Swets 1966; Wickens 2002). Perceptual mapping approaches such as multidimensional scaling and clustering derive perceptual spaces from similarity or categorization judgments and have been used to model how listeners structure dialects, accents, and styles (Preston 1999; Clopper and Pisoni 2004). Psychoacoustic approaches model perceptual spacing by transforming acoustic measures into auditory scales that approximate human hearing, including approaches based on Bark and related auditory representations (Traunmüller 1981; Flynn 2011). More recently, computational approaches estimate perceptual similarity using learned auditory features that can be evaluated against behavioral data (Chen, Zhang, and Li 2024). Dialectometric and cross-linguistic work also links perceived distances to linguistic and geographic structure, highlighting how perception is shaped by experience and social knowledge (Gooskens 2012).

Within this landscape, the present metric is intentionally simple and task-compatible with common sociophonetic rating designs. Rather than requiring similarity judgments or forced-choice discrimination, it uses standard rating data and summarizes how strongly a participant differentiates among multiple variants. In that sense, it functions as a transparent dispersion index over a participant's rating profile. The goal is not to replace established perceptual-distance methods, but to provide a portable operationalization of overall differentiation that can be reported consistently across studies that use rating tasks. Future work can further validate the metric against additional behavioral benchmarks such as identification accuracy or response time, but its immediate value is interpretive simplicity and cross-study comparability within the rating paradigm.

2.4.2 Definition and computation

To directly measure sensitivity, we propose the sensitivity score. This score is defined as the sum of the absolute differences between a participant's mean ratings for all unordered pairs of linguistic forms, here aegyo alternations, as in (3).

(3) The sensitivity score

a. A is the set of aegyo alternations considered, including standard forms, individual alternations, and complex combinations (see Table 2).

b. $\bar{r}(p,v,a)$ is the mean rating given by participant p for alternation a within predicate v, averaged over all tokens of that alternation in that predicate.

c. The sensitivity score for participant p and predicate v is the sum of $|\bar{r}(p,v,a_i) - \bar{r}(p,v,a_j)|$ over all unordered pairs of distinct alternations a_i and a_j in A.

In practice, computation proceeds in three steps. First, for each participant and predicate, we compute mean ratings for each alternation category. Second, we calculate absolute differences for every unordered pair of alternations in A. Third, we sum these differences to obtain the sensitivity score.

To illustrate, consider a simplified case with four alternations (A1–A4) for a single predicate V1 rated by a single participant P1. Here, P1 refers to Participant 1, and S(P1,V1) denotes Participant 1's sensitivity score for predicate V1, the predicate 잘했어 "(you) did well." Let A1–A4 correspond to four specific aegyo forms of this predicate (e.g., A1 = 잘해쪄 [affrication], A2 = 잘해썽 [ENC-insertion], A3 = 잘해쎠 [/j/-insertion], A4 = 잘해쏘 [/ʌ/-rounding]). Suppose Participant 1's mean ratings for these alternations within predicate V1 are as in (4a). The sensitivity score is then obtained by summing the absolute differences for all unordered alternation pairs, as shown in (4b).

(4) a. Mean ratings used as inputs

$\bar{r}(P1,V1,A1) = 6$

$\bar{r}(P1,V1,A2) = 4$

$\bar{r}(P1,V1,A3) = 3$

$\bar{r}(P1,V1,A4) = 5$

b. Sensitivity score computation

$$\begin{aligned} S(P1,V1) &= |\bar{r}(P1,V1,A1) - \bar{r}(P1,V1,A2)| + \\ &\quad |\bar{r}(P1,V1,A1) - \bar{r}(P1,V1,A3)| + \\ &\quad |\bar{r}(P1,V1,A1) - \bar{r}(P1,V1,A4)| + \\ &\quad |\bar{r}(P1,V1,A2) - \bar{r}(P1,V1,A3)| + \\ &\quad |\bar{r}(P1,V1,A2) - \bar{r}(P1,V1,A4)| + \\ &\quad |\bar{r}(P1,V1,A3) - \bar{r}(P1,V1,A4)| \\ &= |6-4| + |6-3| + |6-5| + |4-3| + |4-5| + |3-5| \\ &= 2 + 3 + 1 + 1 + 1 + 2 \\ &= 10 \end{aligned}$$

Thus, the sensitivity score for Participant 1 on predicate V1 is S(P1,V1) = 10. A score of 0 indicates no differentiation among alternations, while larger scores indicate stronger overall differentiation. For example, if Participant 1 had given the same mean rating to every alternation within V1 (e.g., $\bar{r}(P1,V1,A1) = \bar{r}(P1,V1,A2) = \bar{r}(P1,V1,A3) = \bar{r}(P1,V1,A4) = 4$), then every pairwise difference would be 0 and S(P1,V1) would equal 0.

In the present research, sensitivity is calculated within each predicate rather than collapsing to a single participant-level value. This yields six sensitivity scores per participant, one per predicate, producing 258 sensitivity observations in total for analysis. This choice preserves more information than a single aggregate and defines sensitivity as differentiation among variants within a constant lexical frame, while still offering a summary measure that is easier to interpret than a large set of interaction terms. We treat the sensitivity-score analysis as complementary to the token-level mixed-effects model. The token-level model remains appropriate for identifying which contrasts drive group differences, while the sensitivity score facilitates direct comparison of the overall degree of differentiation across listener groups.

All participants used the same 1–7 rating scale in this study, so the size of a one-point difference is directly comparable across participants and items. For that reason, we report the sensitivity score in its raw form as the sum of pairwise absolute differences. The metric generalizes straightforwardly across designs. When studies involve different numbers of alternations, sensitivity can be reported as an average difference per pair by dividing the summed differences by the number of pairs. When studies use different rating scales, scores can be normalized by dividing each absolute difference by the maximum possible difference on that scale, yielding values that are comparable across studies.

Finally, the sensitivity score is not restricted to aegyo. It is applicable wherever researchers elicit ratings across multiple socially meaningful variants and wish to quantify how strongly listeners differentiate among them. Cross-linguistically, it can be applied to other cuteness-indexed registers such as Mandarin sajiao and Japanese burikko (Miller 2004; Hardeman 2013; Yang 2023). It can also be used for socially conditioned segmental variation, such as vowel perception work in Detroit and New Zealand English (Niedzielski 1999; Hay et al. 2006), for prosodic phenomena where listeners evaluate boundary tones or prominence (Moon 2017), and for sound-symbolic contrasts where ratings reflect affective or iconic meaning (Jang 2025).

3. Methods

3.1 Stimuli

Stimuli were composed of six predicates in the past tense as given in Table 3. These predicates were then recorded by a 33-year-old L1 Korean-speaking man and a 29-year-old L1 Korean-speaking woman using Praat SoundRecorder (Boersma and Weenink 2021).[8] Recordings were made with the Praat SoundRecorder tool at 44kHz in mono channel mode with a Logitech H390 wired headset, once in the standard

8 Two native Korean-speaking talkers recorded the stimuli: a 29-year-old woman born and raised in Seoul, and a 33-year-old man born and raised in Jeolla Province who has lived in Seoul since age 19. This study is not a dialect comparison; the two voices were used simply as carriers of the same set of aegyo alternations (one woman, one man). Because participants heard only one talker, and because the sensitivity score is computed from within-participant, within-talker pairwise differences among alternations, any talker-specific baseline differences would primarily affect overall rating level rather than the within-talker differentiation that defines sensitivity. We nevertheless treat talker-related variability as a limitation and encourage future work with a larger talker set matched more closely on dialect.

form, once with each of affrication, nasalization, /ʌ/-round, /j/-insertion, and then with the various combinations of the aegyo alternations given in Table 4, yielding 15 tokens per speaker.[9]

Table 3. Six predicates (Sim et al. 2024)

Predicate (given in past-tense form)	IPA	Korean written form	Gloss
Haengbokhaesseo	/hɛŋ.pok.hɛs*.ʌ/	행복했어	[I] was happy
Gippeosseo	/ki.p*ʌs*.ʌ/	기뻤어	[I] was glad
Sinnasseo	/sin.nas*.ʌ/	신났어	[I] was excited
Meogeosseo	/mʌ.kʌs*.ʌ/	먹었어	[I] ate
Masyeosseo	/ma.sjʌs*.ʌ/	마셨어	[I] drank
Ibeosseo	/i.pʌs*.ʌ/	입었어	[I] wore

Table 4. Aegyo forms of [maɕʰiʌ-s*ʌ] '(I) drank (something)' (Sim et al. 2024)

Item	# Aegyo sounds included	Types of Aegyo alternations	IPA	Korean written form
1	0	standard	[maɕʰjʌ.s*ʌ]	마셔써
2	1	affrication	[maɕʰjʌ.tɕ*ʌ]	마셔쩌
3	1	/j/-insertion	[maɕʰjʌ.s*jʌ]	마셔쎠
4	1	/ʌ/-rounding	[maɕʰjʌ.s*o]	마셔쏘
5	1	ENC-insertion	[maɕʰjʌ.s*ʌŋ]	마셔썽
6	2	affrication + /j/-insertion	[maɕʰjʌ.tɕ*jʌ]	마셔쪄
7	2	affrication + /ʌ/-rounding	[maɕʰjʌ.tɕ*o]	마셔쪼
8	2	affrication + ENC-insertion	[maɕʰjʌ.tɕ*ʌŋ]	마셔쩡
9	2	/j/-insertion + /ʌ/-rounding	[maɕʰjʌ.s*jo]	마셔쑈
10	2	/j/-insertion + ENC-insertion	[maɕʰjʌ.s*jʌŋ]	마셔쎵
11	2	/ʌ/-rounding + ENC-insertion	[maɕʰjʌ.s*oŋ]	마셔쏭
12	3	affrication + /j/-insertion + /ʌ/-rounding	[maɕʰjʌ.tɕ*jo]	마셔쬬
13	3	affrication + /j/-insertion + ENC-insertion	[maɕʰjʌ.tɕ*jʌŋ]	마셔쪙

9 One possible variant, 마셔쫑 maɕʰiʌ.tɕ*oŋ, which combines affrication, /ʌ/-rounding, and ENC-insertion, was accidentally left out of the experimental stimuli. This happened due to a simple oversight when manually creating the list of forms. Since the combinations were generated by hand and involved many variants, this item was unintentionally missed. The omission was not intentional or theory-driven, and it does not affect the overall results.

14	3	/j/-insertion + /ʌ/-rounding + ENC-insertion	[maɕʰiʌ.s*jo]	마셔쑝
15	4	affrication + /j/-insertion + /ʌ/-rounding + ENC-insertion	[maɕʰiʌ.tɕ*joŋ]	마셔쫑

To ensure that the aegyo alternations were accurately represented in the stimuli, the spectrogram of each token was visually inspected in Praat (Boersma and Weenink 2021). The following cues were used to confirm presence of the relevant alternation: presence of a stop closure for affrication, a falling F2 and rising F1 between the end of the consonant and the steady state of the vowel for /j/-insertion, a lower F1 and F2 compared to non-rounded /ʌ/ for /ʌ/-rounding, and a large decrease in intensity following the vowel for ENC-insertion.[10]

3.2 Participants

Participants were 43 native speakers of Korean (19 women, 24 men). They were divided into two age groups: 22 participants aged 40 and above (hereafter, Over 40) and 21 participants aged under 40 (hereafter, Under 40). Participants heard stimuli from only one of two talkers: a 33-year-old man (n = 24) or a 29-year-old woman (n = 19). We operationalized age as Under 40 versus Over 40 to distinguish listeners who are broadly peer-aged with the talkers (i.e., in their 20s–30s) from listeners who are unambiguously older (40+). Because speaker age is often perceptible from voice (Krauss et al. 2002; Goy et al. 2016) and because age relations are plausibly relevant to the social interpretation of aegyo, this grouping provides an interpretable peer versus older-than-talker comparison. We emphasize that 40 is an operational cutoff suited to the present stimulus design rather than a theoretical boundary for aegyo. The overall distribution is given in Table 5.

10 Note that [o] is backer and higher than [ʌ] in Korean (Shin 2015; Zhang 2023).

Table 5. Participants by speaker gender, listener gender, and age group (Sim et al. 2024)

Speaker: Woman		
	Older (Over 40); M = 61	Younger (Under 40); M = 32
Women Participants	3	7
Men Participants	6	3
Speaker: Man		
	Older (Over 40); M = 59	Younger (Under 40); M = 30
Women Participants	7	5
Men Participants	6	6

3.3 Procedure

The experiment consisted of three parts: (i) instruction, (ii) pre-task, and (iii) main task. In the instruction section, written instructions were given to participants to help them understand the experimental procedure. In the pre-task section, they were given three questions. In each question, they were given two written forms - one using the standard form of a verb and the other using the aegyo form of the same verb - and were asked to decide which form sounds "aegyoful." This pre-task confirmed that the participants agreed that the aegyo form sounds more aegyoful than the standard form (out of 129 responses (43 participants × 3 pre-items), 120 responses were in aegyo form and 9 were in standard form). In the main task, they were given audio clips of aegyoful speech and were asked to listen to those files and rate each clip on a scale of 1 (not aegyoful at all) to 7 (very aegyoful). While rating, they could listen to the clip as many times as they wished. Participants' aegyo rating scores for each sound were collected via Google Forms.

This procedure resulted in each participant listening to 90 tokens (15 forms × 6 predicates) and thus giving 3870 tokens overall for the experiment (43 participants × 15 forms × 6 predicates).

3.4 Statistics

To validate the sensitivity metric, we fit two linear mixed-effects regression models: one following Jang (2021) with cuteness rating as the dependent variable, and one with the sensitivity score as the dependent variable.

The aegyofulness-rating model was designed to ensure comparability with Jang's results. Fixed effects included the three-way interaction of *Alternation* × *Age Group* × *Listener Gender* (as in Jang 2021), as well as *Speaker Gender* × *Listener Gender* to control for the use of two speakers. Random intercepts were included for *Participant* and *Item*.

The sensitivity model tested our operationalization of sensitivity. Fixed effects included the three-way interaction of *Age Group* × *Listener Gender* × *Speaker Gender*. Random intercepts were included for *Participant* and *Item*.

All models were fit in *R* (R Core Team 2025) using the *lmer()* function from the *lme4* package (Bates et al. 2015) with *p*-values generated using the *lmerTest* package (Kuznetsova et al. 2017). Estimated marginal means (EMMs) were obtained with the *emmeans* package (Lenth 2025), and visualizations were produced with *ggplot2* (Wickham 2016).

4. Results

4.1 Aegyofulness ratings

4.1.1 Aegyofulness descriptive results

The raw results of the experiment are displayed in Table 6. These conform with Jang's (2021) results for written data: women perceivers give (descriptively) higher scores than men perceivers, and older participants give higher scores than younger ones.

Table 6. Raw results for aegyofulness rating

Factor	Level	Aegyofulness Rating (SD)
Speaker Gender	Women	4.619 (1.671)
	Men	4.670 (1.559)
Listener Gender	Women	4.894 (1.557)
	Men	4.390 (1.624)
Age	Over 40	5.033 (1.343)
	Under 40	4.244 (1.760)
Listener Gender × Age	Women Over 40	5.100 (1.193)
	Women Under 40	4.721 (1.787)
	Men Over 40	4.977 (1.455)
	Men Under 40	3.607 (1.504)

4.1.2 Aegyofulness inferential analysis

The model summary for the aegyofulness-rating model is displayed in Table 7.[11]

Table 7. Aegyofulness-rating model summary

Factor	Level	Estimate	Lower CI	Upper CI	*p*-value
Intercept	(Intercept)	3.762	2.894	4.629	<.001***
AltType	affrication	1.00	0.621	1.379	<.001***
	/j/-insertion	0.800	0.421	1.179	<.001***
	/ʌ/-rounding	0.600	0.221	0.979	0.002**
	ENC-insertion	1.250	0.871	1.629	<.001***
	affrication + /j/-insertion	1.633	1.255	2.012	<.001***
	affrication + /ʌ/-rounding	1.700	1.321	2.079	<.001***
	affrication + ENC-insertion	1.817	1.438	2.195	<.001***
	/j/-insertion + /ʌ/-rounding	1.350	0.971	1.729	<.001***
	/j/-insertion + ENC-insertion	1.600	1.221	1.979	<.001***
	/ʌ/-rounding + ENC-insertion	1.567	1.188	1.945	<.001***
	affrication + /j/-insertion + /ʌ/-rounding	1.350	0.971	1.729	<.001***
	affrication + /j/-insertion + ENC-insertion	1.367	0.988	1.745	<.001***
	/j/-insertion + /ʌ/-rounding + ENC-insertion	1.433	1.055	1.812	<.001***
	affrication + /j/-insertion + /ʌ/-rounding + ENC-insertion	1.283	0.905	1.662	<.001***
AltType × Listener Gender	affrication + /j/-insertion × men	-0.606	-1.118	-0.093	0.021*
	affrication + /ʌ/-rounding × men	-0.561	-1.074	-0.049	0.032*
	/j/-insertion + /ʌ/-rounding × men	-0.822	-1.335	-0.310	0.002**
	/j/-insertion + ENC-insertion × men	-0.531	-1.043	-0.018	0.042*
	/ʌ/-rounding + ENC-insertion × men	-0.539	-1.051	-0.026	0.039*
AltType × Age	/ʌ/-rounding × under 40	0.678	0.165	1.190	0.010*
	affrication + /j/-insertion + ENC-insertion × under 40	0.661	0.149	1.174	0.011*

11 Only significant effects ($p < .05$) are displayed. See Appendix I for the full model.

	affrication + /j/-insertion + /ʌ/-rounding + ENC-insertion × under 40	0.661	0.149	1.174	0.011^{*}
AltType × Listener Gender × Age	affrication × men × under 40	-1.074	-1.810	-0.338	0.004^{**}
	/ʌ/-rounding × men × under 40	-1.076	-1.812	-0.340	0.004^{**}
	affrication + ENC-insertion × men × under 40	-1.128	-1.864	-0.392	0.003^{**}
	/j/-insertion + /ʌ/-rounding × men × under 40	-0.553	-1.289	0.183	0.141
	affrication + /j/-insertion + ENC-insertion × men × under 40	-0.883	-1.619	-0.148	0.019^{*}
	affrication + /j/-insertion + /ʌ/-rounding + ENC-insertion × men × under 40	-1.194	-1.929	-0.458	0.001^{**}
Note. AltType = alternation type; *** = p < .001, ** = p < .01, * = p < .05					

The regression analysis produced multiple significant two- and three-way interactions among alternation, listener gender, and age, replicating Jang's (2021) finding that alternation ratings are gender and age dependent. Further, pairwise comparisons of estimated marginal means suggest that older speakers give significantly higher aegyo ratings than do younger speakers [*est.* = 0.867, *SE* = 0.327, $t(38)$ = 2.65, p = .012], whereas women give higher ratings than men at a marginally significant level [*est.* = 0.622, *SE* = 0.327, $t(38)$ = 1.904, p = .065]. Both of these results are identical to Jang's (2021) cuteness ratings in directionality and level of significance. To illustrate rating and sensitivity patterns, Figure 1 plots raw mean ratings with 95% confidence intervals for each listener group.

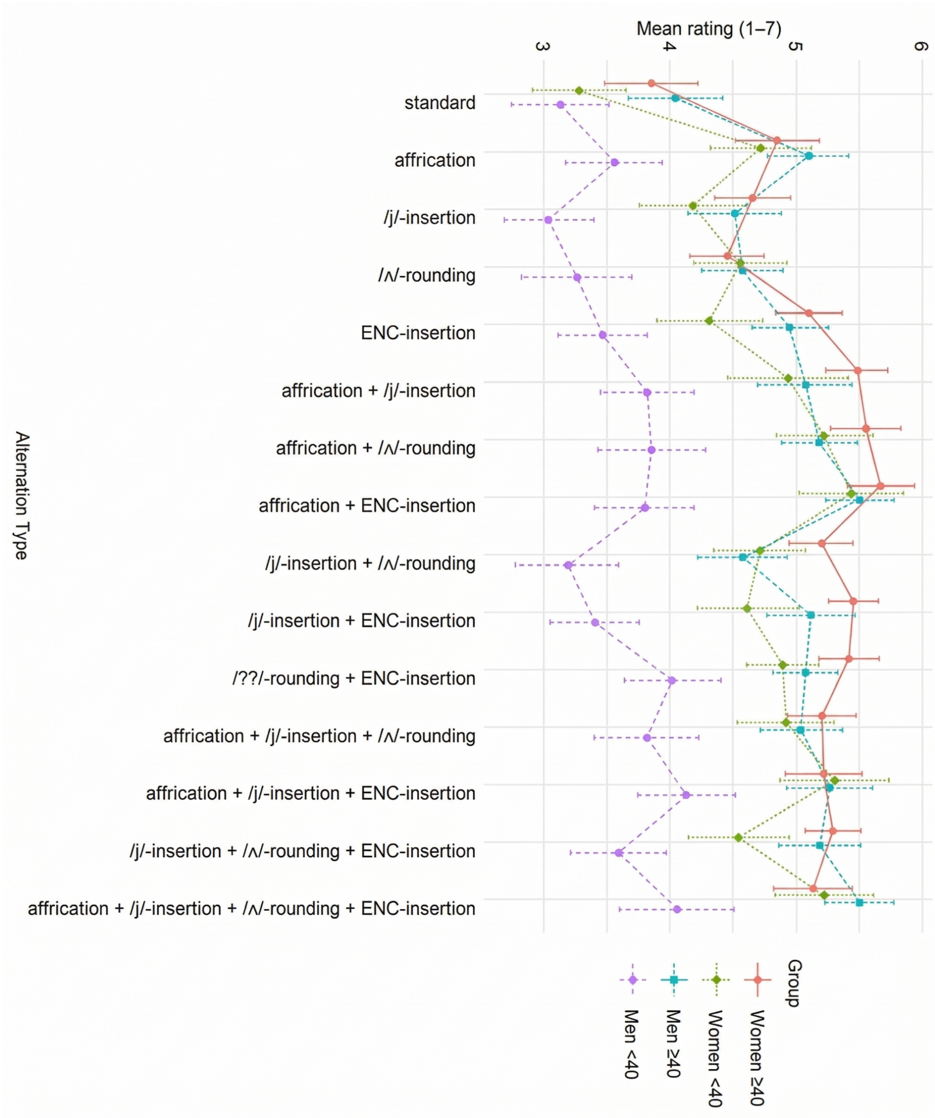

Figure 1. Aegyofulness rating by alternation type for each gender × age group

While the interaction structure in the aegyofulness-rating model confirms that evaluations of aegyo forms are socially conditioned, it remains difficult to summarize overall differences in listener sensitivity from a large set of alternation-specific interaction terms. The model identifies which alternations and contrasts pattern by age and gender, but it does not provide a single, directly comparable measure of how strongly different listener groups differentiate among variants overall.

To address this interpretive gap, we next apply the sensitivity score, which collapses each participant's pattern of differentiation across alternations into a continuous value. This allows us to compare the overall magnitude of perceptual differentiation across listener groups without relying on indirect interpretation of multiple interaction terms.

4.2 Sensitivity scores

4.2.1 Sensitivity score descriptive results

The raw results for sensitivity score are given in Table 8. They seem to suggest that sensitivity score does not depend on speaker gender, but that it may depend on the interaction of listener gender and age, with younger women being the most sensitive to aegyo and older men being the least. To statistically corroborate this finding, we turn to our linear regression model.

Table 8. Raw results for sensitivity score

Factor	Level	Sensitivity Score (SD)
Speaker Gender	Women	114.351 (59.521)
	Men	119.139 (47.382)
Listener Gender	Women	133.242 (50.315)
	Men	100.032 (50.604)
Age	Over 40	104.724 (46.910)
	Under 40	129.889 (56.129)
Listener Gender × Age	Women Over 40	114.400 (41.437)
	Women Under 40	148.944 (51.906)
	Men Over 40	96.694 (49.889)
	Men Under 40	104.481 (51.672)

4.2.2 Sensitivity score inferential analysis

The mixed-effects linear regression model summary for sensitivity score is given in Table 9.

Table 9. Sensitivity-score model summary

Factor	Level	Estimate	Lower CI	Upper CI	*p*-value
Intercept	(Intercept)	106.94	70.141	143.738	<.001***
Speaker Gender	Men	10.658	-19.362	40.678	.477
Listener Gender	Men	-15.574	-56.696	25.548	.448
Age	Under 40	37.564	-3.996	79.125	.075
Listener Gender × Age	Men × Under 40	-31.553	-91.492	28.385	.293

The sensitivity-score mixed-effects model did not yield statistically significant fixed effects at the conventional $p < .05$ threshold, though age showed a trend such that younger participants tended to have higher sensitivity scores than older participants ($p = .075$). Because coefficients for interaction terms are interpreted relative to the reference levels of the other interacting factors, we additionally conducted Tukey-adjusted pairwise comparisons of estimated marginal means to evaluate differences by listener gender, age group, and their interaction.

The results of the Tukey-adjusted EMMs are displayed in Table 10.

Table 10. Tukey-adjusted pairwise EMMs for gender, age, and gender × age

Factor	Pair	Estimate	Lower CI	Upper CI	*p*-value
Listener Gender	Women - Men	31.351	2.143	60.559	.036*
Age	Over 40 - Under 40	-21.787	-51.038	7.463	.140
Listener Gender × Age	Women Over 40 - Men Over 40	15.574	-38.996	70.144	.869
	Women Over 40 - Women Under 40	-37.564	-92.717	17.589	.276
	Women Over 40 - Men Under 40	9.563	-48.383	67.510	.971
	Men Over 40 - Women Under 40	-53.138	-104.718	-1.558	.041*
	Men Over 40 - Men Under 40	-6.011	-62.003	49.982	.992
	Women Under 40 - Men Under 40	47.127	-9.355	103.61	.130

The EMMs for the sensitivity model revealed a significant difference such that women showed a higher differentiation between aegyo forms than men [*est.* = 31.351, *SE*

= 14.428, *t(38)* = 2.173, *p* = .036]. There was also a significant effect, such that men over 40 displayed less differentiation between aegyo forms than women under 40 [*est.* = -53.138, *SE* = 19.200, *t(38)* = -2.768, *p* = .041]. The raw sensitivity scores by group are visualized in Figure 2.

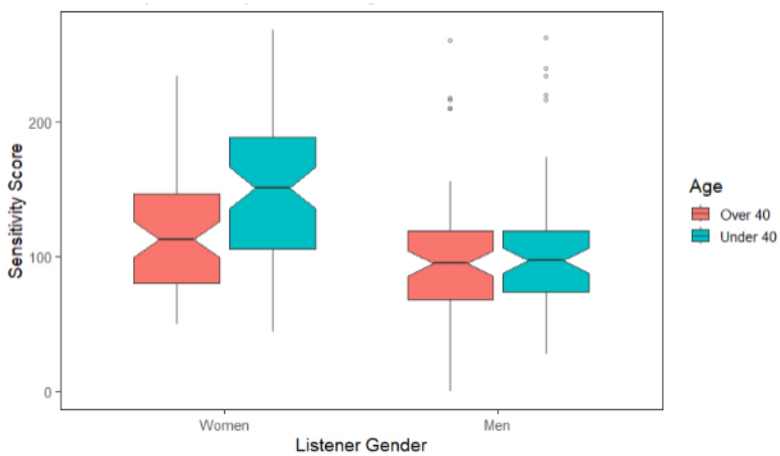

Figure 2. Sensitivity scores by listener gender and age group

5. Discussion

The token-level aegyofulness model replicates the broad direction of social patterning reported in Jang (2021), showing that evaluations of aegyo forms are socially conditioned and that this conditioning is distributed across alternation types and their interactions with listener gender and age. However, the model's complexity makes it difficult to interpret. With fifteen alternation types and multiple higher-order interactions, the results effectively provide a set of contrast-specific stories rather than a single estimate of how strongly a given listener or group differentiates among variants overall. This is not a flaw in mixed-effects modeling of alternation-level ratings. Rather, it reflects a mismatch between the analytic object we often want to talk about in sociophonetic perception, overall sensitivity or perceptual differentiation, and the way this construct is frequently inferred: indirectly via interaction terms and visual inspection of mean patterns. The sensitivity score is intended to bridge that gap. By collapsing pairwise differences into a single continuous measure, it provides a transparent summary of overall differentiation that can be compared across participants, items, and groups without requiring readers to synthesize many alternation-specific coefficients.

Using the sensitivity score, our data support a clear gender difference. Women show higher sensitivity than men, meaning they differentiate more strongly among the set of aegyo variants used in the study. This aligns with Jang's (2021) central claim that sensitivity is linked to social embedding in the register. Aegyo is strongly enregistered as indexing femininity, youthfulness, and intimate stance work (Moon 2013, 2017; Strong 2013; Han 2016; Brown 2017; Jang 2021), and younger women are consistently described as the most frequent users and most culturally salient exemplars of the style.[12] When a style is enregistered, it becomes a socially recognizable bundle of cues whose values are organized into an indexical field that supports persona and stance construction (Agha 2003; Eckert 2008).[13] From this perspective, higher sensitivity among women is not simply a matter of liking aegyo more. Instead, it suggests finer-grained ordering of the style's cues, an ability to perceive micro-distinctions that are socially consequential for performing or evaluating cuteness, intimacy, playfulness, or irony in context. In other words, sensitivity plausibly reflects how available the style's resources are for social meaning.

The age pattern in our study diverges from Jang (2021) in an important way. While Jang argues for heightened sensitivity among older women, our sensitivity results do not show a significant main effect for age, and the trend points in the opposite direction, with younger listeners displaying higher sensitivity. In terms of the interaction between age and gender, the clearest separation is between younger women and older men, with the former showing greater differentiation. This difference is consistent with an experience-based account of sensitivity. If sensitivity indexes fine-grained familiarity with the register's resources, what cues exist, how strongly they signal aegyo, and how they differ in intensity, then the groups most engaged

12 Enregisterment refers to the process by which a set of linguistic forms comes to be seen as a socially distinct way of speaking within a language. In other words, the 'enregisterment of aegyo' is the process by which aegyo came to be recognized as a distinctive way of speaking and the 'enregisterment of Received Pronunciation (RP)' refers to the process by which RP came to be seen as a distincts social dialect within England (Agha 2003).

13 The 'indexical field' is the concept that a linguistic variable does not just have one social meaning but several related social meanings (Eckert 2008). For example, /t/-release in American English can signal not just emphasis but other features like prissiness, precision, education, anger, or connection to a variety of social groups.

in producing and navigating aegyo in everyday life should be most sensitive. In other words, younger women are expected to show the greatest differentiation because they have the greatest need to deploy and interpret these cues in interaction, while older men, who are least associated with aegyo as a normative practice, have less reason to track fine distinctions among variants. Our findings therefore support the core intuition in Jang's account, that sensitivity tracks social practice, while suggesting that additional age-based mechanisms are not required to explain the pattern in our data.[14] This difference also underscores why an explicit sensitivity metric is useful. Without a unified measure, it is easy to overgeneralize from a subset of contrast-specific interactions or to form a visual aggregate impression that may not hold consistently across alternations.

More broadly, the gender and age pattern aligns with experience-based accounts of speech perception in which exposure, learning, and social practice tune perceptual categories. Work on perceptual learning and dialect experience emphasizes that repeated exposure to socially patterned variants can sharpen listeners' representations and increase discrimination of relevant detail (Samuel and Kraljic 2009; Sumner and Samuel 2009; Heald and Nusbaum 2014). Against this backdrop, the distribution of sensitivity scores is consistent with a perception-production loop. Social participation in a style's ecology shapes perceptual resolution of its cues, and that perceptual resolution in turn supports more controlled social meaning work in interaction. This loop connects to communities-of-practice approaches, which locate gendered and age-graded variation in patterns of social practice rather than fixed demographic categories (Eckert and McConnell-Ginet 1992). Aegyo is a particularly clear site for such a mechanism because it is highly recognizable, strongly ideological, and deployed for fine-grained interpersonal positioning. If listeners differ in how much they participate in contexts where aegyo is used, and in how often they monitor or evaluate its cues, then we expect systematic differences in the granularity of their perceptual

14 However, it should be noted that Jang's (2021) analysis and ours are not mutually exclusive. There are several potential factors that could be responsible for the differences in our analyses of sensitivity. Most obviously, our data have a different set of alternations as stimuli, and previous research has proposed that the social meaning of aegyo and the set of features associated with it is dependent on interlocutor age (Han 2016; Crosby 2023). In other words, some groups may be more sensitive to the differences between a certain set of alternations while another group may be more sensitive to the differences between another set due to changes in the set of alternations that trigger the aegyo percept for different groups.

differentiation.

Methodologically, the sensitivity score also clarifies what it means to claim that one group is more sensitive. In many rating studies, group differences can be driven either by overall preference, such as consistently higher ratings, or by differentiation, greater spread across variants. By construction, the sensitivity score targets differentiation rather than preference. This matters because the ability to separate variants, rather than simply preferring aegyo more, better matches the sociolinguistic notion of sensitivity as access to socially meaningful distinctions. A listener who rates all variants as very aegyoful may be able to clearly recognize the register, but they are not necessarily sensitive to differences among its cues. Conversely, a listener who gives moderate average ratings but sharply separates variants demonstrates clear differentiation. By making this distinction explicit, the metric helps connect sociophonetic perception to theories of style and persona (Eckert 2012). If a community has richer stylistic practice, it should not only recognize the register but also differentiate among its internal resources with greater precision. The sensitivity score offers a practical way to quantify this precision.

Note, however, that the simplicity of the sensitivity score comes with trade-offs that shape interpretation. Aggregating across variants reduces the number of observations relative to token-level models and can reduce power, particularly when effects are subtle or driven by a small subset of contrasts. For this reason, we treat the sensitivity score as complementary rather than substitutive. Token-level mixed-effects models remain essential for identifying which alternations and interactions drive group differences and for testing hypotheses about particular cues. The sensitivity score, by contrast, supports a different inferential goal by summarizing the overall magnitude of perceptual differentiation in a way that is transparent and comparable across participants and items.

The broader value of the sensitivity score lies in its portability. Although aegyo is culturally specific, the analytical problem is not. Many perception studies involve multiple socially meaningful variants and aim to quantify how sharply listeners differentiate among them, not only which variant they prefer. Since the sensitivity score can be computed directly from standard rating data, it offers a shared participant-level measure of overall differentiation that can be applied across segmental, prosodic, and sound-symbolic domains.

Overall, the results here show that a simple summary measure can capture interpretable group differences in perceptual differentiation while remaining compatible with standard mixed-effects modeling. We now conclude by summarizing the main contributions of the metric, acknowledging limitations of the present dataset, and outlining directions for future validation and extension.

6. Conclusion

This paper introduced the sensitivity score as a simple operationalization of between-group differences in listener sensitivity to linguistic variation. Using a perception experiment on Korean aegyo, we demonstrated how the metric summarizes the degree to which listeners differentiate among multiple variants in a transparent, participant- and item-level way. Applying the sensitivity score to our aegyo dataset and comparing the resulting patterns to prior work on aegyo perception, including Jang (2021), highlights the value of a unified measure for quantifying overall differentiation in complex multi-variant designs.

Several limitations and boundary conditions should be noted. First, computing sensitivity scores entails aggregation relative to token-level analyses. In our design, the sensitivity analysis uses six observations per participant (one per predicate), which can reduce statistical power and increase the likelihood of Type II error, especially when effects are subtle or driven by a small subset of contrasts. Second, direct comparison to Jang (2021) is limited by differences in design and sampling. Our study uses spoken stimuli rather than written forms, includes a different inventory of alternations and a standard control form, and adopts a different age cutoff (40 rather than 30) due to differences in participant distributions. In addition, participants in our experiment evaluated spoken stimuli directly, whereas Jang (2021) asked participants to imagine themselves as the deliverer of the stimuli which was presented in written form. Finally, we asked participants to rate aegyofulness, whereas Jang (2021) asked them to rate cuteness. For these reasons, a future study that more directly replicates Jang's design would be valuable for distinguishing population differences from methodological differences.

Even with these limitations, the present study points to several clear directions for extending and strengthening the approach. Future work can decompose the sensitivity score into its component pairwise differences to identify which contrasts drive group differences, and it can integrate acoustic measures to link sensitivity patterns to cue weighting and phonetic distance. Longitudinal or training designs could also test experience-based predictions directly by examining whether increased exposure or practice changes sensitivity over time. More broadly, applying the metric to additional datasets will help establish when the sensitivity score is most informative and how it compares to other measures of perceptual differentiation across tasks and domains.

Conceptually, the sensitivity score contributes to sociophonetics by turning an often-invoked but underspecified notion, who notices what and how finely, into a portable dependent variable. Empirically, the aegyo case illustrates how patterns of social practice can be reflected in perceptual differentiation, and methodologically the metric complements interaction-heavy models with a straightforward summary measure that supports comparison across participants, items, and studies. Beyond Korean aegyo, the same approach can be applied to other cuteness-indexed registers such as Mandarin sajiao and Japanese burikko (Miller 2004; Hardeman 2013; Yang 2023), as well as to socially conditioned segmental and prosodic variation and to sound-symbolic contrasts. By providing a replicable way to quantify overall perceptual differentiation, the sensitivity score helps connect fine-grained phonetic variation to broader questions of style, identity, and social meaning.

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Appendix I. Full fixed-effects table for the aegyofulness-rating model

Factor	Level	Estimate	Lower CI	Upper CI	*p*-value
Intercept	(Intercept)	3.762	2.894	4.629	<.001***
AltType	affrication	1.00	0.621	1.379	<.001***
	/j/-insertion	0.800	0.421	1.179	<.001***
	/ʌ/-rounding	0.600	0.221	0.979	0.002**
	ENC-insertion	1.250	0.871	1.629	<.001***
	affrication + /j/-insertion	1.633	1.255	2.012	<.001***
	affrication + /ʌ/-rounding	1.700	1.321	2.079	<.001***
	affrication + ENC-insertion	1.817	1.438	2.195	<.001***
	/j/-insertion + /ʌ/-rounding	1.350	0.971	1.729	<.001***
	/j/-insertion + ENC-insertion	1.600	1.221	1.979	<.001***
	/ʌ/-rounding + ENC-insertion	1.567	1.188	1.945	<.001***
	affrication + /j/-insertion + /ʌ/-rounding	1.350	0.971	1.729	<.001***
	affrication + /j/-insertion + ENC-insertion	1.367	0.988	1.745	<.001***
	/j/-insertion + /ʌ/-rounding + ENC-insertion	1.433	1.055	1.812	<.001***
	affrication + /j/-insertion + /ʌ/-rounding + ENC-insertion	1.283	0.905	1.662	<.001***
Listener Gender	men	0.217	-0.774	1.207	0.662
Age	under 40	-0.536	-1.536	0.463	0.286
Speaker Gender	men	0.126	-0.553	0.806	0.709
AltType × Listener Gender	affrication × men	0.056	-0.457	0.568	0.832
	/j/-insertion × men	-0.328	-0.840	0.185	0.210
	/ʌ/-rounding × men	-0.072	-0.585	0.440	0.782
	ENC-insertion × men	-0.347	-0.860	0.165	0.184
	affrication + /j/-insertion × men	-0.606	-1.118	-0.093	0.021*
	affrication + /ʌ/-rounding × men	-0.561	-1.074	-0.049	0.032*
	affrication + ENC-insertion × men	-0.358	-0.871	0.154	0.171
	/j/-insertion + /ʌ/-rounding × men	-0.822	-1.335	-0.310	0.002**
	/j/-insertion + ENC-insertion × men	-0.531	-1.043	-0.018	0.042*
	/ʌ/-rounding + ENC-insertion × men	-0.539	-1.051	-0.026	0.039*
	affrication + /j/-insertion + /ʌ/-rounding × men	-0.350	-0.863	0.163	0.181
	affrication + /j/-insertion + ENC-insertion × men	-0.144	-0.657	0.368	0.581
	/j/-insertion + /ʌ/-rounding + ENC-insertion × men	-0.294	-0.807	0.218	0.260

	affrication + /j/-insertion + /ʌ/-rounding + ENC-insertion × men	0.175	-0.338	0.688	0.503
AltType × Age	affrication × under 40	0.444	-0.068	0.957	0.089
	/j/-insertion × under 40	0.103	-0.410	0.615	0.694
	/ʌ/-rounding × under 40	0.678	0.165	1.190	0.010*
	ENC-insertion × under 40	-0.222	-0.735	0.290	0.395
	affrication + /j/-insertion × under 40	0.019	-0.493	0.532	0.941
	affrication + /ʌ/-rounding × under 40	0.244	-0.268	0.757	0.350
	affrication + ENC-insertion × under 40	0.336	-0.176	0.849	0.199
	/j/-insertion + /ʌ/-rounding × under 40	0.081	-0.432	0.593	0.758
	/j/-insertion + ENC-insertion × under 40	-0.267	-0.779	0.246	0.308
	/ʌ/-rounding + ENC-insertion × under 40	0.044	-0.468	0.557	0.865
	affrication + /j/-insertion + /ʌ/-rounding × under 40	0.289	-0.224	0.801	0.269
	affrication + /j/-insertion + ENC-insertion × under 40	0.661	0.149	1.174	0.011*
	/j/-insertion + /ʌ/-rounding + ENC-insertion × under 40	-0.169	-0.682	0.343	0.517
	affrication + /j/-insertion + /ʌ/-rounding + ENC-insertion × under 40	0.661	0.149	1.174	0.011*
Listener Gender × Age	men × under 40	-0.397	-1.838	1.045	0.583
AltType × Listener Gender × Age	affrication × men × under 40	-1.074	-1.810	-0.338	0.004**
	/j/-insertion × men × under 40	-0.668	-1.403	0.068	0.075
	/ʌ/-rounding × men × under 40	-1.076	-1.812	-0.340	0.004**
	ENC-insertion × men × under 40	-0.347	-1.083	0.389	0.355
	affrication + /j/-insertion × men × under 40	-0.362	-1.098	0.374	0.335
	affrication + /ʌ/-rounding × men × under 40	-0.661	-1.397	0.075	0.078
	affrication + ENC-insertion × men × under 40	-1.128	-1.864	-0.392	0.003*
	/j/-insertion + /ʌ/-rounding × men × under 40	-0.553	-1.289	0.183	0.141

	/j/-insertion + ENC-insertion × men × under 40	-0.525	-1.261	0.211	0.162
	/ʌ/-rounding + ENC-insertion × men × under 40	-0.183	-0.919	0.552	0.625
	affrication + /j/-insertion + /ʌ/-rounding × men × under 40	-0.604	-1.340	0.132	0.108
	affrication + /j/-insertion + ENC-insertion × men × under 40	-0.883	-1.619	-0.148	0.019*
	/j/-insertion + /ʌ/-rounding + ENC-insertion × men × under 40	-0.506	-1.242	0.229	0.177
	affrication + /j/-insertion + /ʌ/-rounding + ENC-insertion × men × under 40	-1.194	-1.929	-0.458	0.001**
Note. AltType = alternation type; *** = $p < .001$, ** = $p < .01$, * = $p < .05$					

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Received: 2025. 09. 29.
Revised: 2026. 03. 12.
Accepted: 2026. 03. 17.