

# Social Perceptions of Phrase-Final Post-Tonic Lengthening in Male Speakers of American English

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## 1 Introduction

Post-tonic lengthening (henceforth PTL) is a rhythmic phenomenon in which an unstressed syllable is durationally longer than a preceding, primary stressed syllable. Recent sociolinguistic research on PTL has shown that it's increasing phrase-finally<sup>1</sup> in apparent time in California, such that as speakers get younger, the ratios of their post-tonic to tonic syllables increase (Calder, Eckert, Fine, and Podesva 2014). Gender differences in its usage have also been observed. Adult women lengthen their post-tonics more than adult men in the California corpus, and the same pattern has been documented in Mandarin, where female actors in a Chinese drama employ greater phrase-final lengthening than male actors (Callier 2011). Interestingly, the gender structuring doesn't hold in pre-adolescent children, for whom PTL is employed equally among boys and girls (Calder, Eckert, Fine, and Podesva 2014).

That gender emerges as a significant social predictor of lengthening in adults, but not in young children, supports previous claims that it is only in later adolescence that boys and girls diverge into gendered linguistic styles (Labov 2001). What kind of socio-indexicality (Eckert 2008) is PTL imbued with that encourages women to continue to use the feature into adulthood, and men to retreat from it? Callier's (2011) finding may offer some insight. While women make greater use of phrase-final lengthening than the men in his data, among the men, those whose characters are more "refined", and hence "closer to the women" in demeanor and comportment use more lengthening than the men who are "martial" and measured. What this reveals is that phrase-final lengthening indexes not simply "female", but character qualities ideologically connected to femaleness. While we need to be careful about drawing social meaning generalizations cross-linguistically and cross-culturally, I'd argue that the similar gender pattern that emerges in both Chinese and English suggests that phrase-final lengthening is socio-indexically similar in both languages. This is likely the result of ideologies stemming from its sound symbolism, which I elaborate on later in 4.

Given that women make greater use of phrase-final lengthening than men, and that among men, those who are "closer to women" make greater use of phrase-final lengthening than other men, an open question is whether these gendered production patterns would similarly yield gendered perceptions in a social evaluation task. That is, are men who employ PTL viewed as more feminine (a trait often associated with women) than those who do not? And because linguistic features that receive high scores for femininity in men are also correlated with higher scores for gayness (Levon 2006), are men who employ PTL viewed as more gay than those who do not? This study investigates these questions explicitly in a matched-guise social perception experiment. As numerous perception studies on sexuality in men have centered on /s/ frequency (e.g., Levon 2006, 2007, 2014; Campbell-Kibler 2011, forthcoming; Maegard and Pharaoh 2016, et alia), other features that are ideologically connected to gender and sexuality-based meanings are understudied. Because of this lack of

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<sup>1</sup>For the entirety of this paper, post-tonic lengthening is considered synonymous with phrase-final post-tonic lengthening.

empirical coverage, a robust account of how gender, sexuality, and linguistic features become intertwined in a social landscape cannot be adequately hypothesized. This study is thus conducted toward this end by considering the role of rhythm in perceptions of sexuality.

## 2 Experiment and hypothesis

This study employs a matched-guise social perception task to probe listener perceptions of PTL in men. The hypothesis is fourfold. First, guises with PTL will receive higher scores for femininity than guises without lengthening. This is based on the assumption that femininity is ideologically associated with women, and it is women who employ post-tonic lengthening more frequently. Second, guises with lengthening will receive higher scores for flamboyance than guises without lengthening, because of ideologically connections among femininity, flamboyance, and women (Eckert 2014). Third, guises with lengthening will receive higher scores for gayness than guises without, because male voices that are rated as sounding feminine also tend to be rated as sounding more gay (Levon 2006). Fourth, guises with lengthening will receive lower scores for masculinity than guises without.

### 2.1 Materials

Four male speakers of American English in their 20s produced four different utterances with PTL in a sound-proof room. Speakers were provided a sample recording of the prosody and speech rate they were to imitate for each utterance. All utterances were produced with a H-L% terminal contour. While the H-L% contour isn't the most frequent contour of declarative sentences in American English, it was chosen for two reasons. First, the H\* pitch accent upsteps the L% boundary tone, raising its pitch and thereby making it easier for speakers to avoid creaky voice, which often occurs naturally at the ends of utterances as speakers' voices lower in pitch and trail off. Second, the upstep of the L% tone results in a flattening of the pitch contour, allowing for easy splicing without disruptions of pitch excursions. The utterances were matched for total number of syllables, syllabic structure of the post-tonic word (tonic onset, nucleus, and coda; and post-tonic onset, nucleus, and coda), and lexical frequency of the PTL word (based on the corpus of Contemporary American English).

### 2.2 Stimuli creation

Each recorded utterance was converted to a lengthened and a shortened variant.<sup>2</sup> Each variant was created by splicing out a beginning portion of the post-tonic syllable in Praat at a zero-crossing point to avoid clipping in the signal. The duration of the syllable that was spliced out of the signal depended on the total durations of the tonic and post-tonic syllables. The desired ratio of the post-tonic to tonic syllable for all lengthened stimuli was set at 2.0, and the ratio of the post-tonic to tonic syllable in all shortened stimuli was set at 0.9. These ratios were determined on the basis of 75th percentile and 25th percentile ratios observed for all speakers analyzed in Calder, Eckert, Fine, and Podesva 2014. All 32 critical stimuli were converted to .mp3 format from .wav format to decrease the file size and theoretically the loading time for participants with slower Internet connections.

### 2.3 Participants

384 speakers of American English were recruited on Amazon Mechanical Turk and were paid \$0.25 for their time. The experiment took approximately 2 minutes to complete.

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<sup>2</sup>I am using "shortened" as synonymous with "non-lengthened" in this paper.

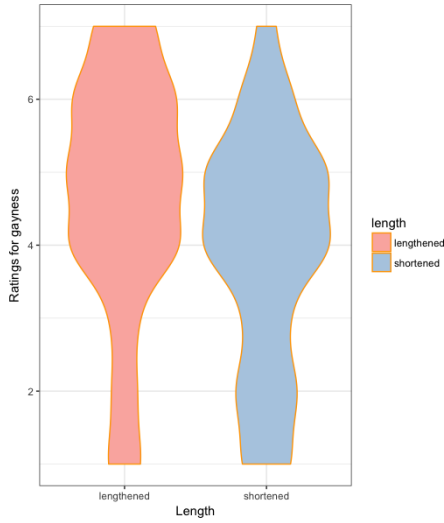


Figure 1: Gayness ratings

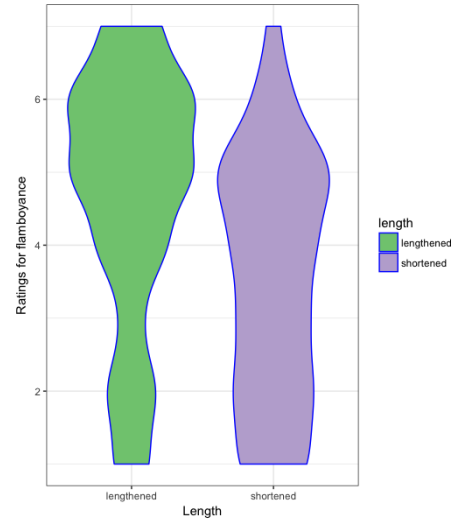


Figure 2: Flamboyance ratings

## 2.4 Procedure

A between-subjects design was used. Each participant was randomly assigned one of the 32 critical stimuli and was told that the stimuli had been randomly selected from a spoken conversation. They were asked to rate the speaker along each of eight descriptors based on his style of speaking. Each descriptor was situated along a 7 point likert scale. Four of the eight descriptors were of interest to the hypothesis: “masculine”, “feminine”, “gay”, and “flamboyant”. Four filler adjectives were also included: “intelligent”, “educated”, “sincere”, and “friendly”. The order that adjectives was presented in was randomized. After rating the voice they heard, participants answered an attention-check question which asked about the content of the recording.

## 3 Results

Only one participant failed the attention-check question, and her responses were excluded from the analysis. Separate mixed-effects linear regression models using the lme4 package (Bates et al. 2015) in RStudio based on the responses of the 383 participants were fit to each of the eight descriptors. Based on model comparisons of BIC and AIC values, as well as ANOVAs of nested models, the best model for each of the predictors included the fixed effect *length* and random effects *speaker* and *word*. Below I present only the models for which length had an effect on a descriptor. Length had no effect on ratings for the four filler adjectives, as predicted.

Descriptor	Estimate	Std. Error	df	t-value	p-value
Gayness	-0.8013	0.1551	380.2409	-5.165	3.88e-07 ***
Flamboyance	-1.1678	0.1637	379.8590	-7.132	5.03e-12 ***
Femininity	-0.6493	0.1757	379.6385	-3.695	0.000252 ***
Masculinity	0.4715	0.1598	378.9528	2.95	0.00337 **

Table 1 shows that the hypothesis was proven correct. Speakers gave guises with lengthening higher scores for femininity ( $p < 0.0001$ ), gayness ( $p < 0.0001$ ), flamboyance ( $p < 0.0001$ ), and lower scores for masculinity ( $p < 0.001$ ). These results are visualized in Figures 1-4.

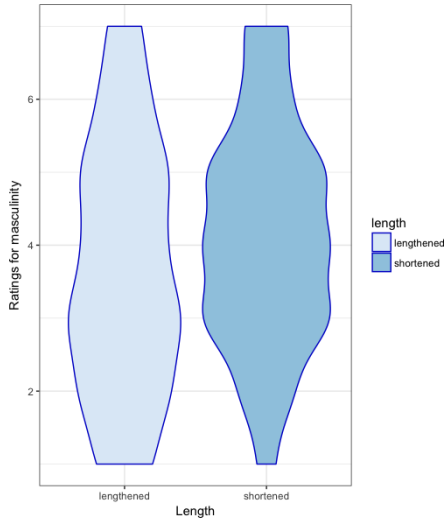


Figure 3: Gayness ratings

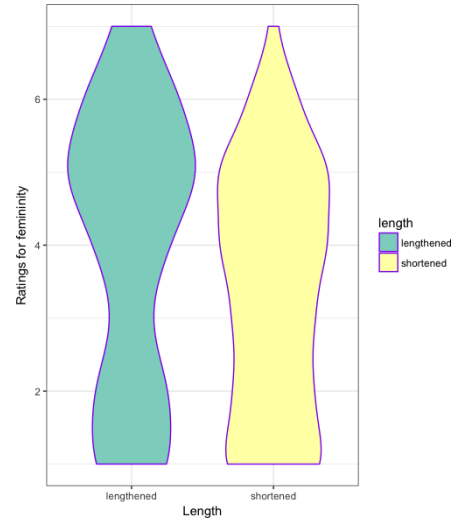


Figure 4: Flamboyance ratings

## 4 Discussion and significance

The results of the experiment show that PTL is connected to gendered meanings in perception. This is consistent with the production patterns observed in previous studies, where women lead men in their use of lengthening. But how PTL’s socio-indexical link to gender is forged is unanswerable from this study alone and requires further work. That is, *why* do women lengthen more than men? And, perhaps most relevant to this experiment, *why exactly* are men who employ PTL perceived as more feminine, flamboyant, and gay, and less masculine, than those who do not? Perhaps the most obvious answer to this last question is that because participants’ experience with lengthening has, for the most part, likely been from the mouths of women (or perhaps gay men, although this has yet to be shown empirically), they perceive men who use it as as possessing character qualities that women are ideologically believed to embody. This idea formed the conceptual basis for the hypotheses of this experiment. And while this is no doubt true in part, I’d also argue that the fact that lengthening had a greater effect on certain adjectives than others suggests that the “core” indexicality (Moore and Podesva 2009) is much more nuanced. The strongest correlation was between lengthening and flamboyance (Est. = -1.1678), a quality that many women certainly express, but one that is not as closely linked to ideologies of “femaleness” as femininity, for example. I would thus suggest that the social meaning of PTL is linked to gender and sexuality not simply because women use it more frequently, but from some other source of meaning. Eckert (2017) has argued for the role of iconicity in giving rise to the social meaning of fine-grained phonetic features, so it may be through this lens that the core indexicality can be uncovered. Indeed, in considering the form of PTL, it becomes clear that speakers who make use of PTL are quite literally “expressing” more than speakers who don’t. They aren’t expressing more semantically, but pragmatically and socially through the use of extra non-truth-conditional linguistic content. This may explain why lengthening correlated so strongly with flamboyance, a quality characterized by excessive, non-minimal behavioral displays. Flamboyance may be at the core of the indexical field (Eckert 2008) for PTL, and the other meanings gleaned from the perception study arise from their ideological connections to this quality. Of course, this is all hypothesizing in the absence of adequate stylistic production data. But I would nonetheless argue that in considering PTL from sound symbolic perspectives, we can learn much about what it means to sound gendered.

The results also complicate theories of sound symbolism more broadly. While Eckert (2017) has argued that sound symbolic meanings are not universal or “natural”, as any and all form to meaning links are culturally-specific and mediated by

ideologies of naturalness within a particular culture, the present experiment shows that certain features may carry meanings that surpass the bounds of a particular language and ideological sphere. The social attributes connected to PTL in English are similar to those proposed by Callier (2011) for Chinese.

Last, the experiment pushes the study of perceptual sexuality in men beyond /s/ frequency. The results show that linguistic rhythm is fruitful to consider in future work, not only in understanding the empirical range of features that are linked to “gayness”, but in understanding *how* and *why* the link between a linguistic feature and “gayness” (and related meanings) is formed in the first place.

## 5 Conclusion

This study employed the matched-guise technique to determine whether the gender patterns observed in production data of post-tonic lengthening would be replicated in individuals’ social perceptions of the feature. The results showed that they were: male voices in lengthened guises received higher scores for gayness, femininity, flamboyance, and lower scores for masculinity than shortened guises. The study highlights the role that linguistic rhythm, an umbrella of features (of which PTL is one) often ignored by sociolinguists, can play in the gendering of language.

## 6 References

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