

Listeners do not need an F1/F2 target to perceive vowel quality or regional accentedness

Kevin B. McGowan, Stella Takvoryan
Department of Linguistics, University of Kentucky

BACKGROUND

Silent centers (SC): listeners can identify vowel quality in a CVC syllable even with 65% of tense vowels and 50% of lax vowels removed (Strange & Jenkins, 2013). However, listeners may still require vowel centers to hear social information. Three complementary ideas in the literature suggest that social information in vowel centers may be *essential*:

- Primacy of F1/F2 at the vowel midpoint**, sometimes taken along with duration, e.g., sociophonetics, sound change, second language acquisition, etc. (Kelley & Tucker, 2020; Labov et al., 1972; Nycz & Hall-Lew, 2013; Thomas, 2014)
- Hybrid silent centers** (Rakerd & Verbrugge, 1987; Verbrugge & Rakerd, 1986): pairing SC syllable edges from different talkers does not undermine vowel perception so argue vowel edges do not carry social information
- Vowel normalization** (Johnson, 2005; Johnson & Sjerps, 2021) assumes that variation is problematic for listeners so models typically operate on vowel centers where contextual variation is least (Barreda & Jaeger, 2025) XXX cite Joe here too

METHODOLOGY

- Talkers:** Three non-Southern talkers from the Wildcat corpus (Van Engen et al., 2010) and two Southern talkers recorded in Kentucky
- Stimuli:** BVT syllables with [i, ɪ, e, ɛ, æ, u, ʊ, o, ʌ, ɔ, a]; **middle 50% for lax vowels & middle 65% for tense vowels** (Strange et al., 1983) excised with a custom Praat script (see Figure 3)
- Procedure:** 2AFC; listeners heard a CVC word and answered either “what did you hear?” with a pair of words or “who did you hear?” and the maps in Figure 1. “What?” trials displayed a map congruent with the talker; “Who?” task trials displayed the word that was being spoken.

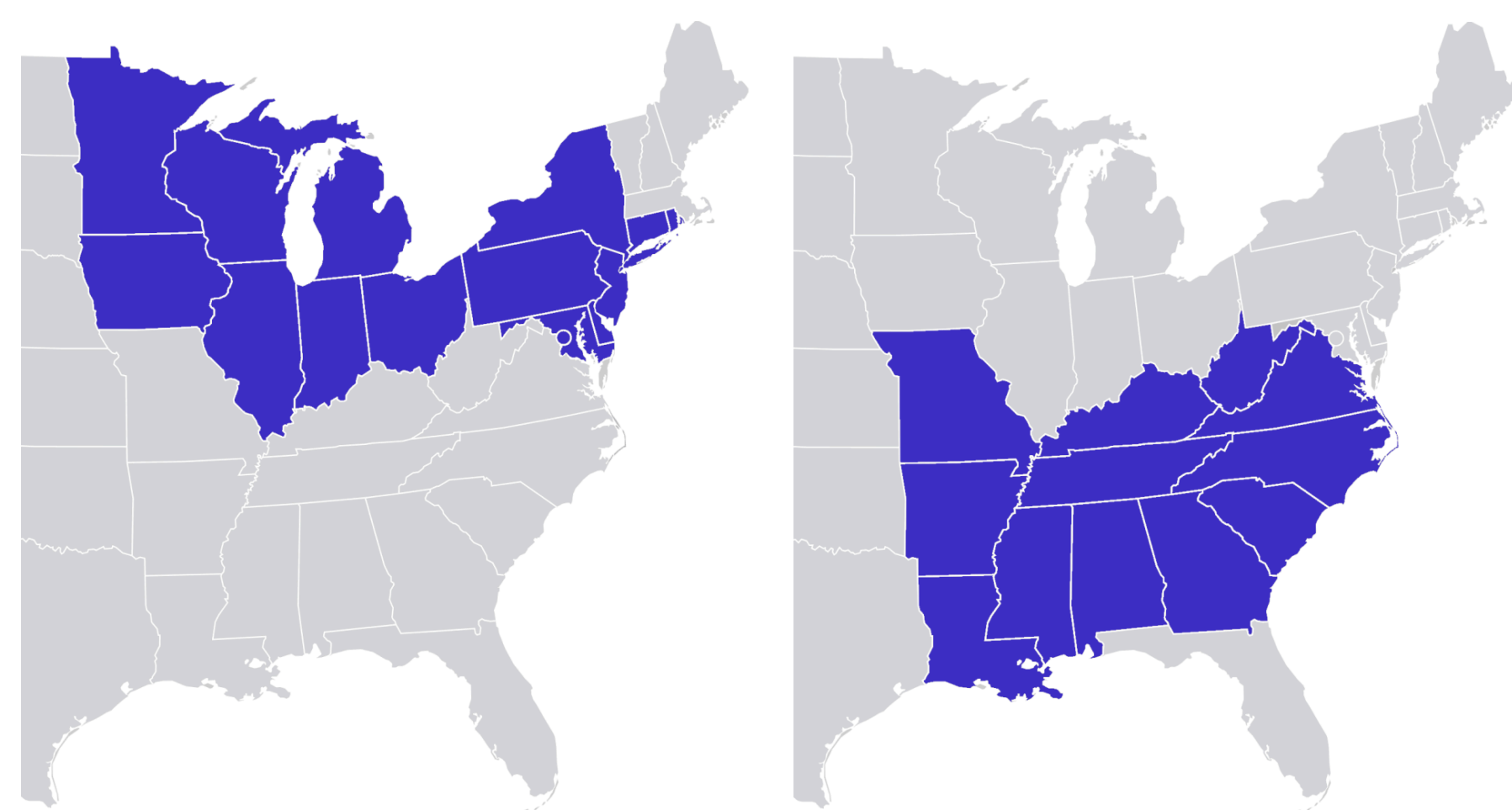


Figure 1: “Non-Southern” and “Southern” stimuli

- Participants:** 60 US participants recruited via Prolific
- Analysis:** BRMS logistic regression in R (Bürkner, 2017), NHST with bayestestR (Makowski et al., 2019)

- Many studies have found that listeners perform poorly when asked to label regional accents (Campbell-Kibler, 2025; Clopper & Pisoni, 2004; Milroy & McClenaghan, 1977). Our simplified maps are intended to represent Clopper & Pisoni’s “dialect clusters”
- While it is clear that listeners do not need vowel centers to perceive vowel quality accurately, it is not yet known whether listeners can perceive, for example, regional accent without the vowel center.

PREDICTIONS

	If V center is necessary	If V center is not necessary
“Who do you hear?” task	Chance or below-chance accuracy	Above-chance accuracy
“What do you hear?” task	High accuracy (SC replication)	High accuracy (SC replication)

Figure 2: Predictions under two assumptions about social information

SILENT CENTERS VISUALIZED

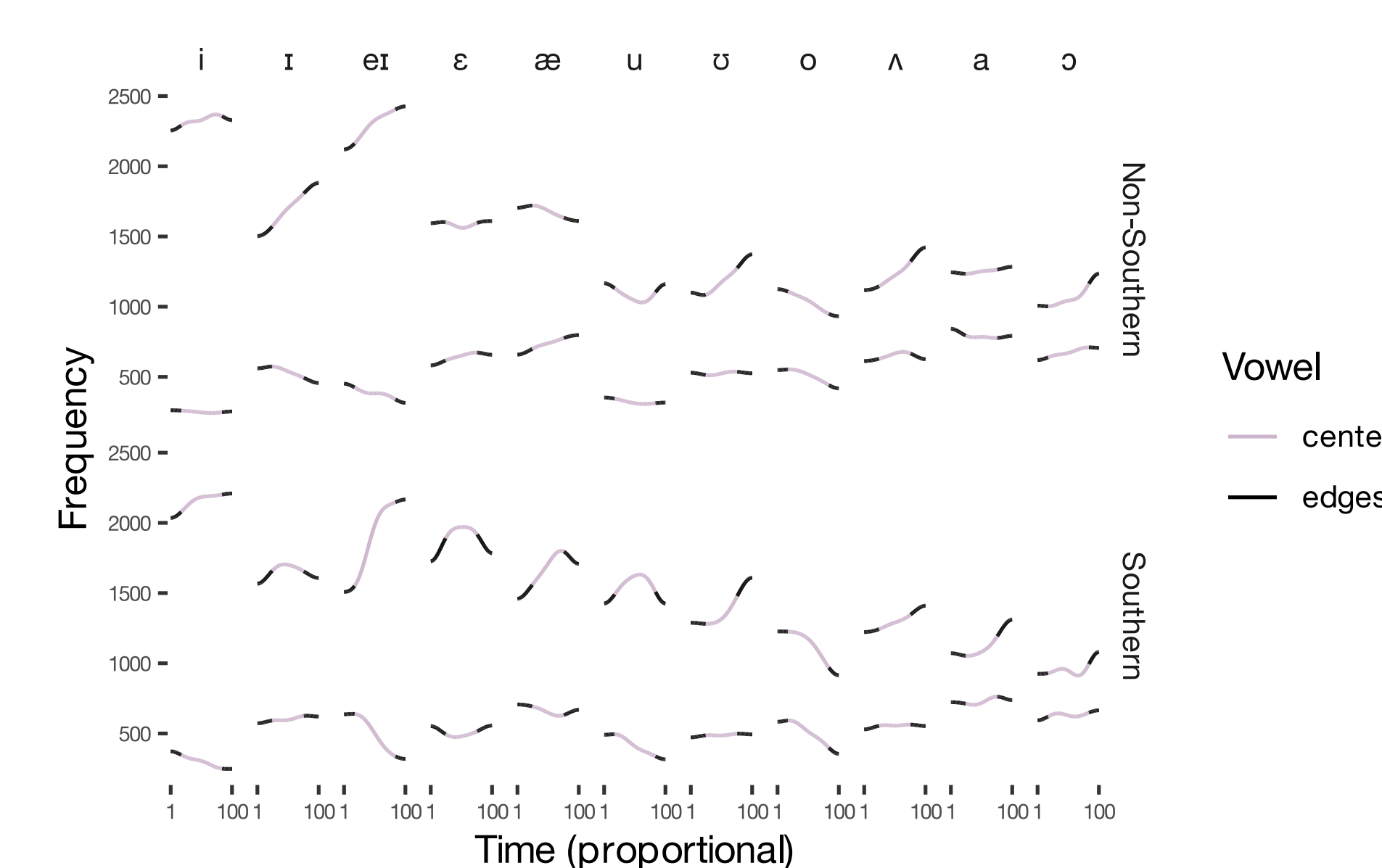


Figure 3: Vowel stimuli DCTS with excised portions indicated

RESULTS

We will place a figure or image below using markdown syntax. We can specify the caption and specifying height or width (or both). The figures are numbered automatically.

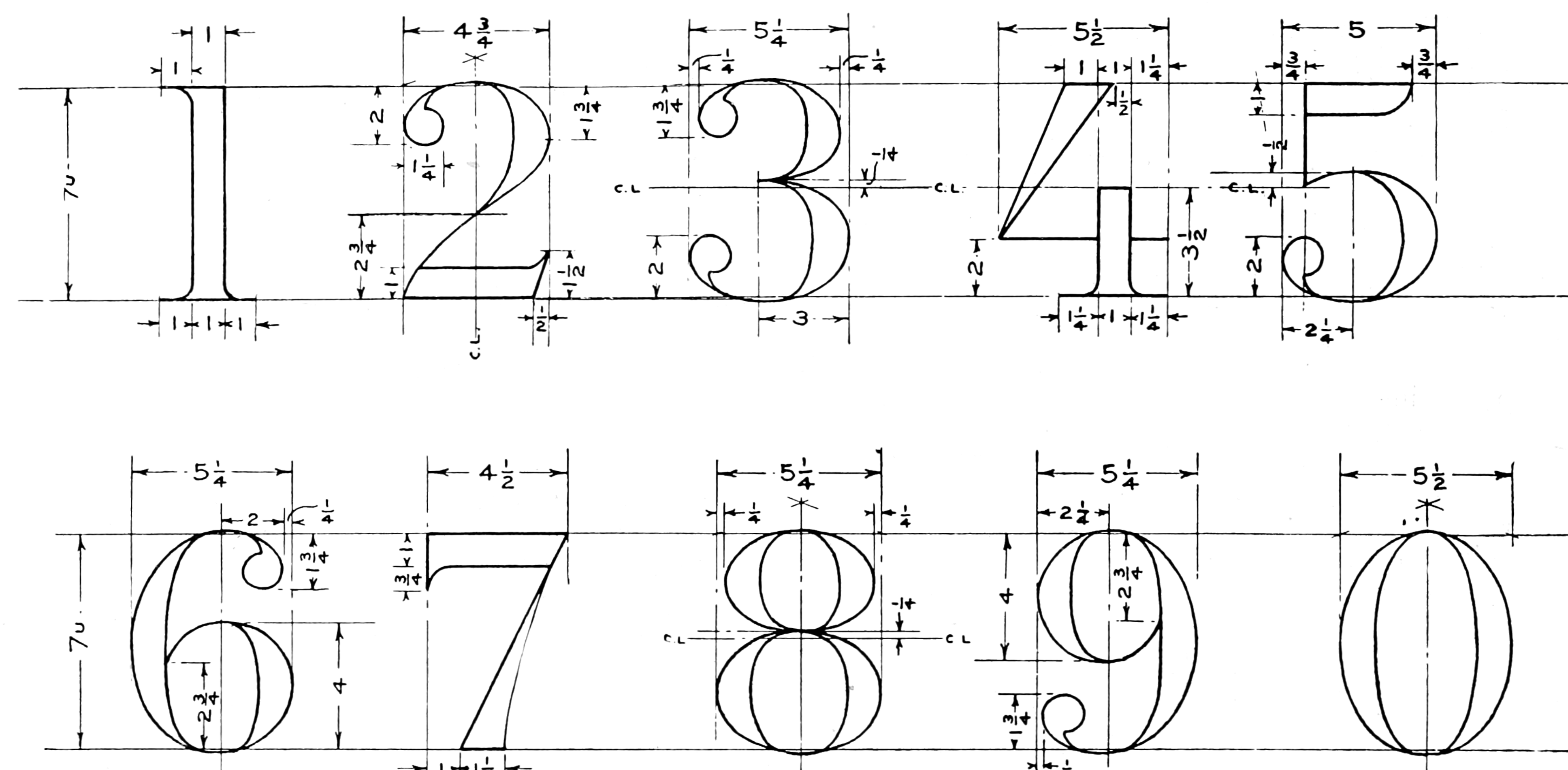


Figure 4: The details of a specific serif font.

DISCUSSION

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis sagittis posuere ligula sit amet lacinia. Duis dignissim pellentesque magna, rhoncus congue sapien finibus mollis. Ut eu sem laoreet, vehicula ipsum in, convallis erat. Vestibulum magna sem, blandit pulvinar augue sit amet, auctor malesuada sapien. Nullam faucibus leo eget eros hendrerit, non laoreet ipsum lacinia. Curabitur cursus diam elit, non tempus ante volutpat a. Quisque hendrerit blandit purus non fringilla. Integer sit amet elit viverra ante dapibus semper. Vestibulum viverra rutrum enim, at luctus enim posuere eu. Orci varius natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus.

Nunc ac dignissim magna. Vestibulum vitae egestas elit. Proin feugiat leo quis ante condimentum, eu ornare mauris feugiat. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Mauris cursus laoreet ex, dignissim bibendum est posuere iaculis. Suspendisse et maximus elit. In fringilla gravida ornare. Aenean id lectus pulvinar, sagittis felis nec, rutrum risus. Nam vel neque eu arcu blandit fringilla et in quam. Aliquam luctus est sit amet vestibulum eleifend. Phasellus elementum sagittis molestie. Proin tempor lorem arcu, at condimentum purus volutpat eu. Fusce et pellentesque ligula. Pellentesque id tellus at erat luctus fringilla. Suspendisse potenti.

Etiam maximus accumsan gravida. Maecenas at nunc dignissim, euismod enim ac, bibendum ipsum. Maecenas vehicula velit in nisl aliquet ultricies. Nam eget massa interdum, maximus arcu vel, pretium erat. Maecenas sit amet tempor purus, vitae aliquet nunc. Vivamus cursus urna velit, eleifend dictum magna laoreet ut. Duis eu erat mollis, blandit magna id, tincidunt ipsum. Integer massa nibh, commodo eu ex vel, venenatis efficitur ligula. Integer convallis lacus elit, maximus eleifend lacus ornare ac. Vestibulum scelerisque viverra urna id lacinia. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia curae; Aenean eget enim at diam bibendum tincidunt eu non purus. Nullam id magna ultrices, sodales metus viverra, tempus turpis.

REFERENCES



THANKS

We are grateful to Josef Fruehwald, Jennifer Cramer, Kyler Laycock, Kendal Smith, XXXSella’s Partner, and Shane O’Nan for their invaluable assistance with this project.