Length & gradience in Dolgan rounding harmony

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    - Phonologisation of vowel reduction.
    - 'Language contact'.

Harmony decay & harmony retention

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  - Reduction also implicated in the emergence of harmony (e.g. Hyman 2002).

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  - **Centralisation** of the vowel space reported for several Turkic languages: Kyrgyz (McCollum 2020), Tatar (Conklin & Dmitrieva 2018), Uyghur (McCollum, Durvasula & Abudushalamu 2024), with or without attendant harmony decay.

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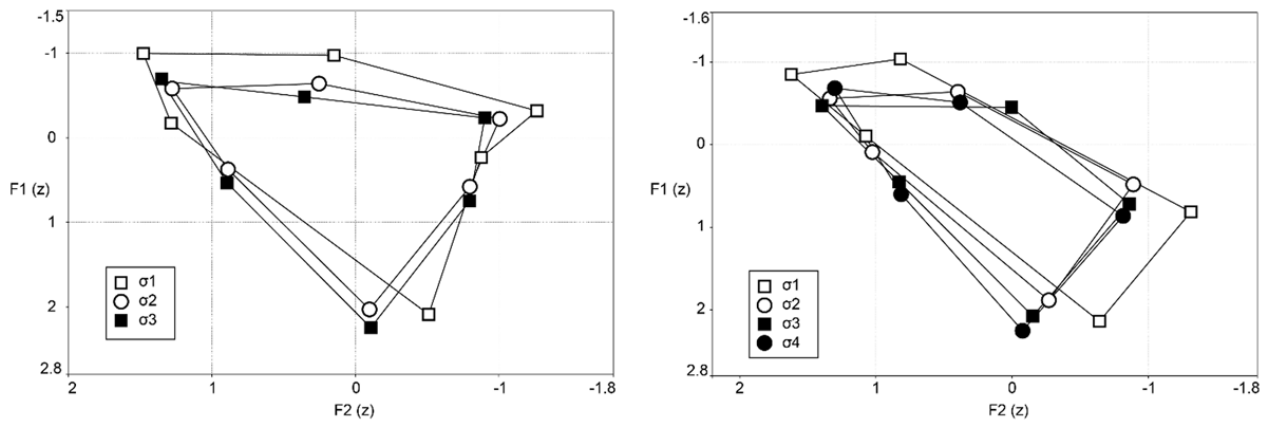

McCollum (2020): Vowel reduction in Kyrgyz.

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  - Decay. Bobaljik (2018): harmony decay in Itelmen (Chukotko-Kamchatkan) depends crucially on both *structural factors* (vowel merger) and *borrowing* from Russian.
    - Closely-related Chukchi retains harmony for structural reasons.

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- **Question.** What drives harmony retention in the face of conditions that favour decay?

Dolgan

The picture across Turkic

- Where does Dolgan fit in?

Dolgan

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- Where does Dolgan fit in?

Language	Harmony loss?	Centralisation?	Russian contact?	Phonemic length?	Sources
Crimean Tatar	yes (rounding)	yes	yes	no	McCollum & Kavitskaya 2022
Kazakh	yes (rounding)	yes	yes	no	McCollum 2015
Kyrgyz	no	yes	yes	**yes**	McCollum 2020
Sakha	no	yes	yes	**yes**	Chan & Kuang 2023
(Kazan) Tatar	yes (rounding)	yes	yes	no	Conklin & Dmitrieva 2018
Uighur	no	yes	**no**	no	McCollum, Durvasula & Abudushalamu 2024
Uzbek	yes (total)	yes	*yes**	no	Sjoberg 1963; Harrison, Dras & Kapicioglu 2006

* Uzbek VH loss predates Russian contact, but is due to contact with a different non-VH lg.

Dolgan

The language

Dolgan territory (reproduced from Däbritz 2022: 4).

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Dolgan settlements (reproduced from Däbritz 2022: 5).

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- Long-term contact with Evenki (Tungusic) in particular (also Mongolic, Samoyedic).
- Next to no phonological literature, but thorough recent descriptive grammar (Däbritz 2022).

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Non-high	(e∼ɛ) eː	(ø∼œ) øː	a aː	(o∼ɔ) oː
Diphthong	i̯e̯	y̯œ̯	ɨ̯a̯	u̯o̯

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- The diphthongs /ie, yœ̯, uo/ historically descend mainly from long *mid* vowels; occasionally also from lenitions in VCV sequences (especially of velars).
  - E.g. **bēš* > /bie̯s/ ‘five’, **tȫrt* > /tyœ̯rt/ ‘four’, **ōn* > /uo̯n/ ‘ten’.
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- /ɨa̯/ seems to derive from /aCI/ sequences.
  - E.g. **tabul* > /tɨa̯l/ ‘wind’, **biagïr* > /bɨa̯r/ ‘liver’.

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Non-high target	/uː-lAr/ uːlar ‘water-PL’ /yŋyː-lAr/ yŋyːler ‘spear-PL’	/ok-lAr/ oktor ‘arrow-PL’ /børø-lAr/ børølør ‘wolf-PL’

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- Diphthongs behave like high vowels (Däbritz 2022: 55), as in Sakha (Chan & Kuang 2023: 3296).

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- Montreal Forced Aligner (McAuliffe et al. 2017) for segmentation; trained a customised model for Dolgan; manual checking in progress.

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  - *z*-score normalised.
  - Data tagged by us for: details of vowel (phonemic length, rounding, fronting, height); syllable count; root vs. affix status, along with morphological material; preceding & following consonantal context; underspecification.

Dolgan

Language contact

- **Can we evaluate how much borrowing we see?**
  - Focusing on lexical borrowing; plenty of morphological borrowing from Mongolic and Evenki, largely early.

Borrowing source	tokens	% tokens	stems	% stems
Native lexicon	45030	77.9	3274	51.2
Russian	9097	15.7	2765	43.2
Mongolic	3318	5.74	447	3.85
Evenki	359	0.621	171	1.38
Sakha	13	< 0.1	8	0.124
Nganasan	10	< 0.1	5	< 0.1

Dolgan

Language contact

- **Can we evaluate how much borrowing we see?**
  - We can also break this down by genre: `conv` conversational data, `flk` folklore, `nar` narrative, `misc` miscellaneous.
  - For all tokens:

Borrowing source	conv		flk		nar		misc	
	n	%	n	%	n	%	n	%
Native lexicon	12625	74.6	7440	83.9	24887	77.9	78	78.0
Russian	3179	18.8	903	10.2	5009	15.7	6	6.0
Mongolic	1064	6.3	429	4.8	1809	5.7	16	16.0
Evenki	45	0.3	93	1.1	221	0.7	0	0.0
Sakha	8	0.0	0	0.0	5	0.0	0	0.0
Nganasan	3	0.0	0	0.0	7	0.0	0	0.0

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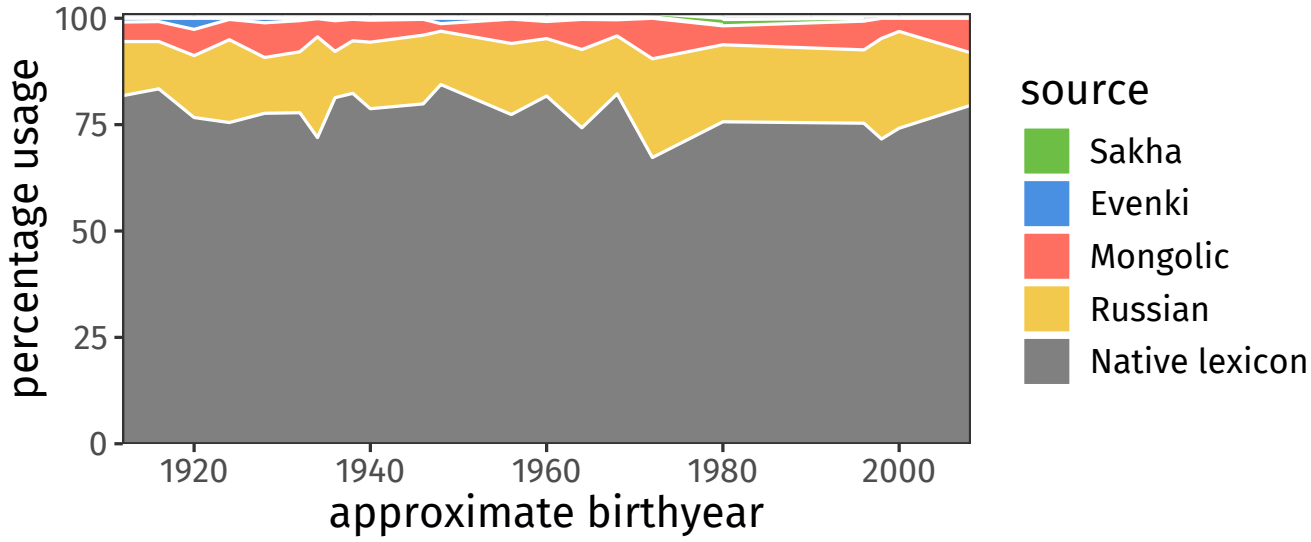
  - And for unique stems:

Borrowing source	conv		flk		nar		misc	
	n	%	n	%	n	%	n	%
Native lexicon	1339	48.7	1143	78.9	2433	54.9	55	80.9
Russian	1270	46.2	184	12.7	1734	39.2	4	5.88
Mongolic	113	4.1	91	6.3	189	4.2	9	13.4
Evenki	21	0.8	30	2.1	61	1.4	0	0.0
Sakha	6	0.2	0	0.0	3	0.1	0	0.0
Nganasan	2	0.1	0	0.0	5	0.1	0	0.0

Dolgan

Language contact

- **Can we evaluate how much borrowing we see?**
  - *Inter-speaker variation?*



Some variation, no statistically-significant trend.

Dolgan

*Language contact & **disharmony***

- **How much disharmony do we see?**
- Overall:

	tokens	% tokens	stems	% stems
Harmonic, backness+rounding	50575	87.5	3804	60.9
Disharmonic, rounding only	4231	7.32	920	14.9
Disharmonic, backness only	1891	3.27	932	14.9
Disharmonic, backness+rounding	1134	1.96	584	9.35

Dolgan

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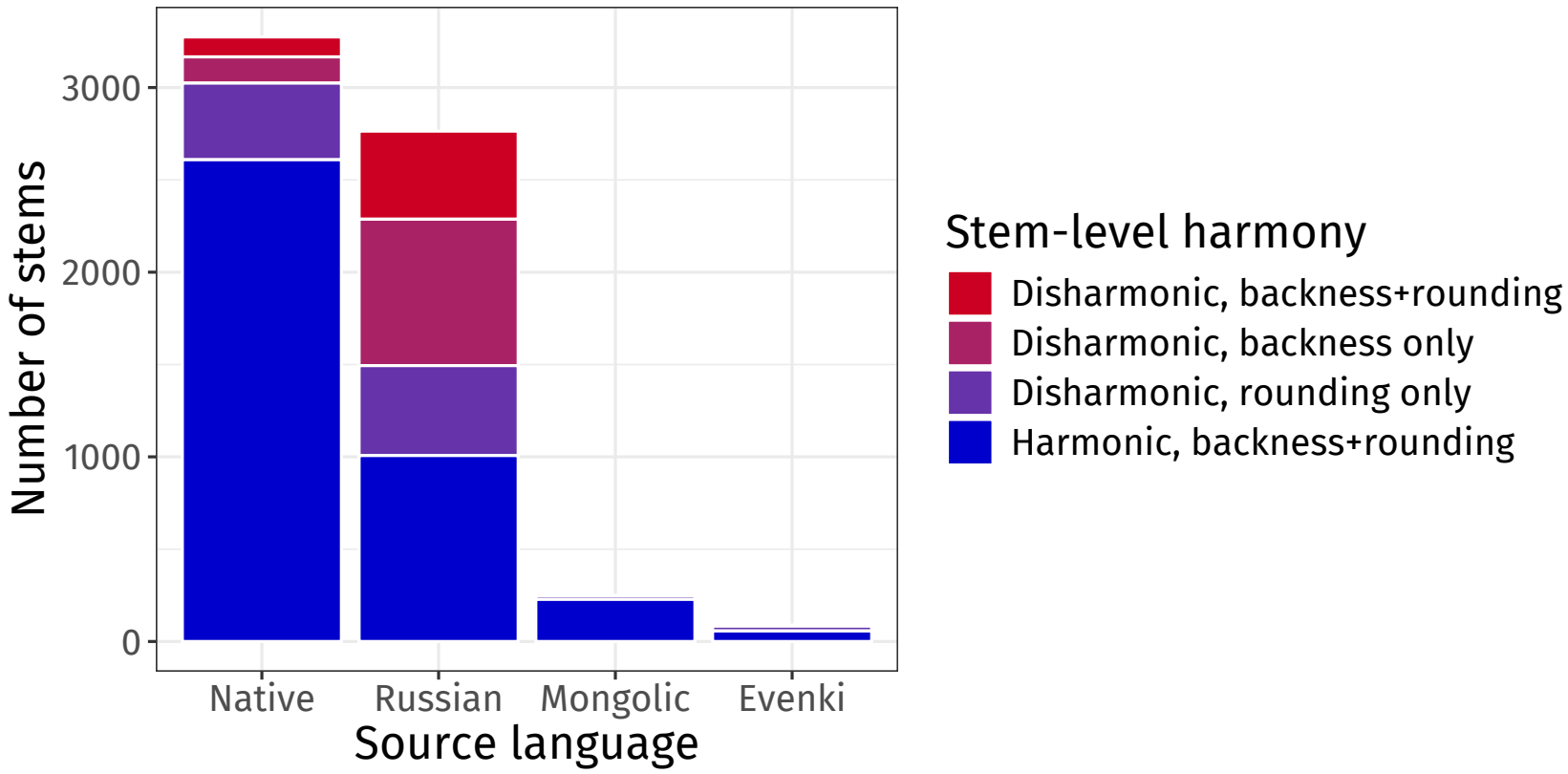
- How much disharmony do we see?

  By source:



Dolgan

Language contact & disharmony

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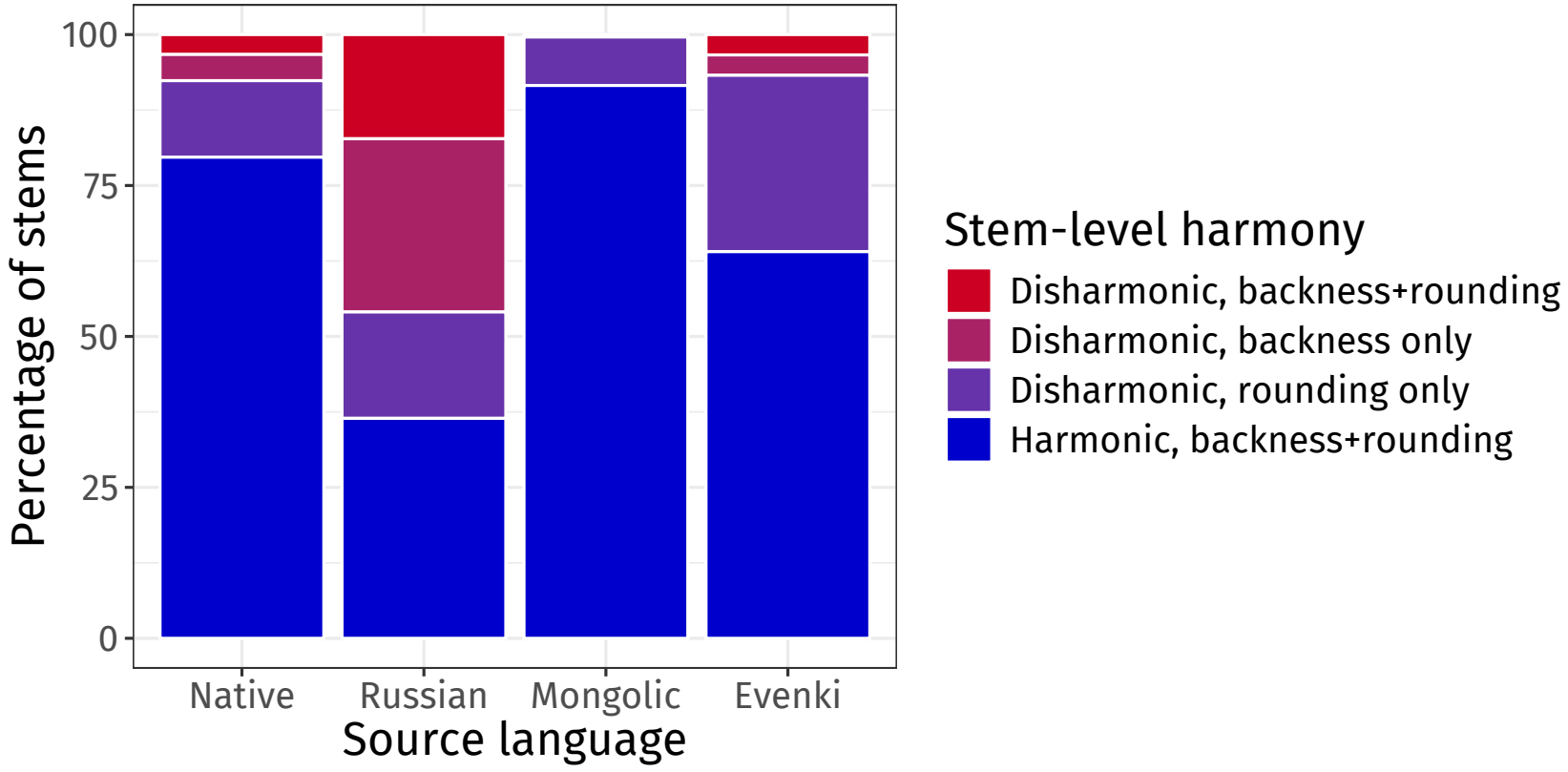
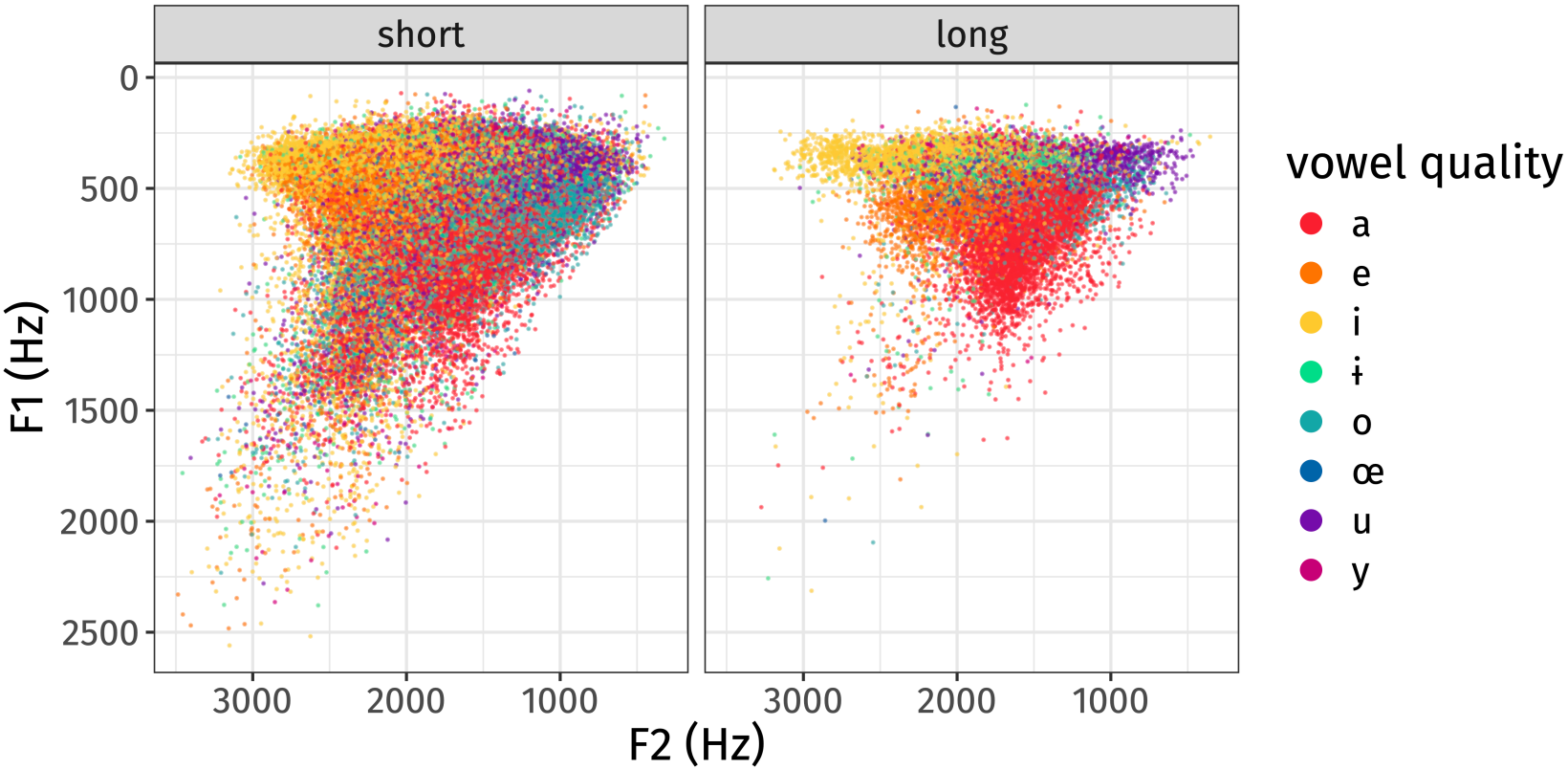


Dolgan

*Language contact & **disharmony***

- **How much disharmony do we see?**
- Plenty of disharmony, mostly driven by Russian borrowing.

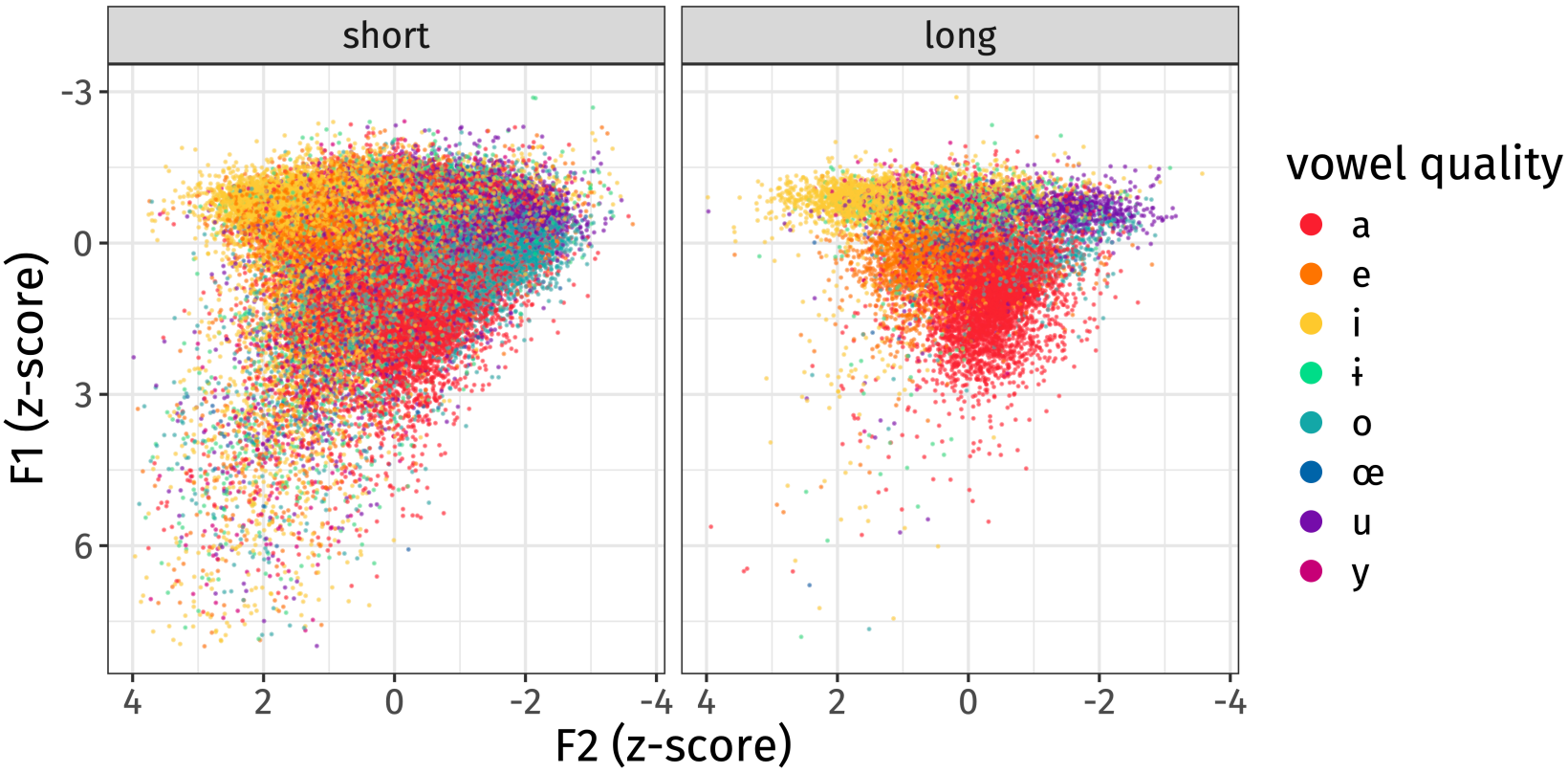
Data quality?



Raw data.

(Predictably,) **long vowels** look reasonably good already; a lot of alignment & measurement error in the **short vowels**.

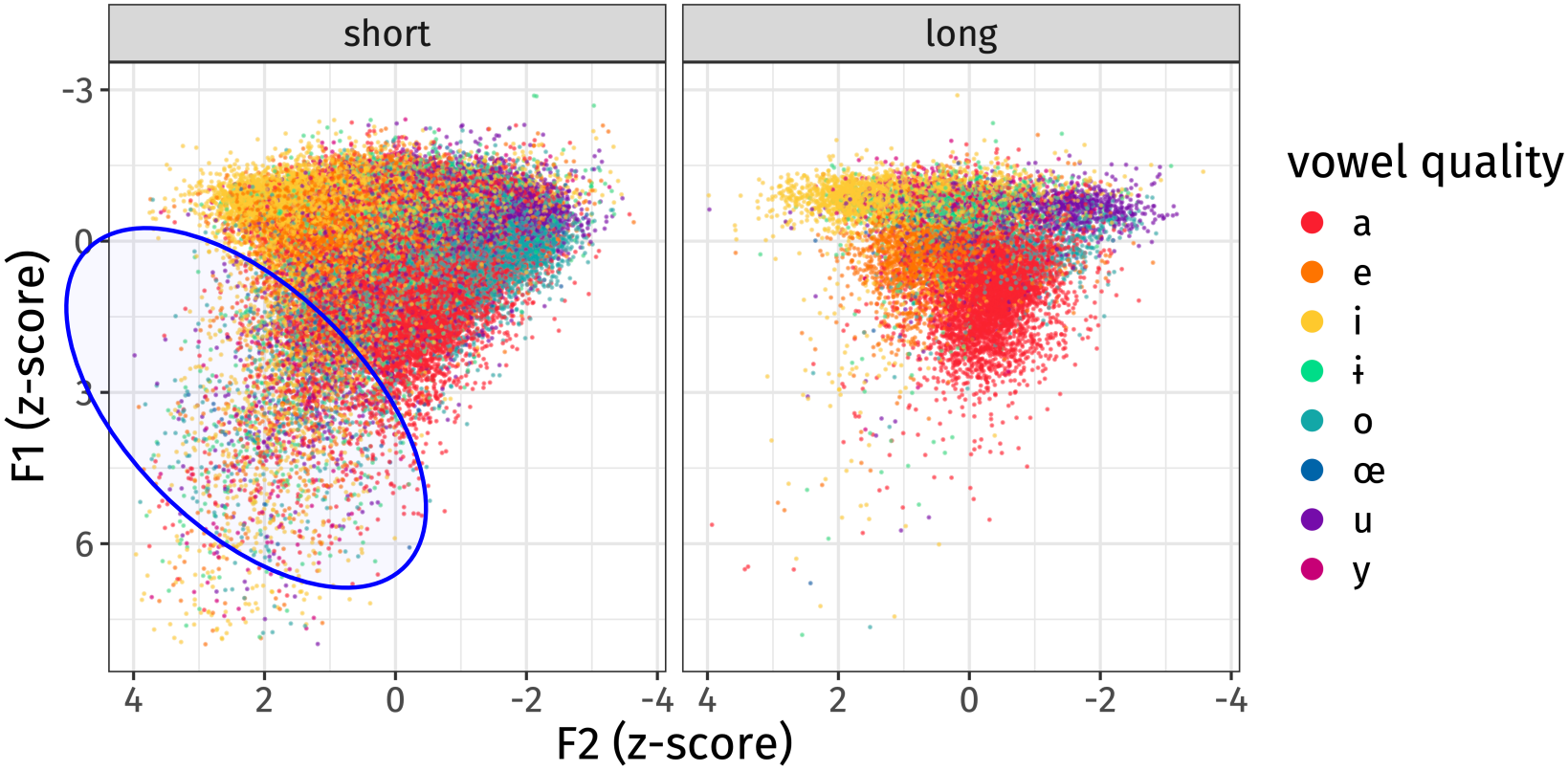
Data quality?



Uncorrected, *z*-score-normalised data.

Normalisation removes some bimodality (due to speaker sex) esp. in the long vowels, but short vowel error remains significant..

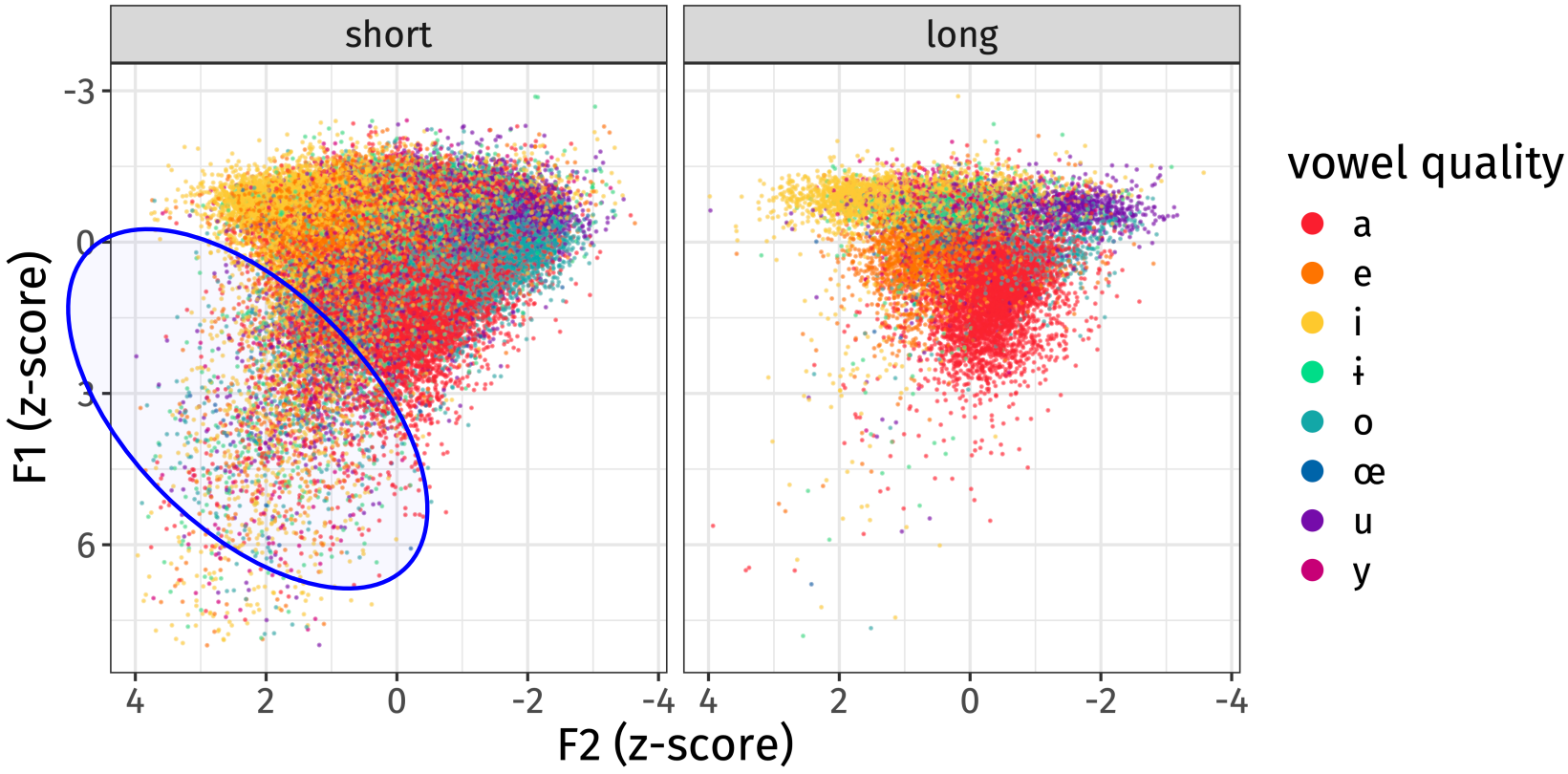
Data quality?



Uncorrected, *z*-score-normalised data.

5-6% (23975/444276 measurements) in 'physically impossible' range, presumably more error within plausible vowel space.

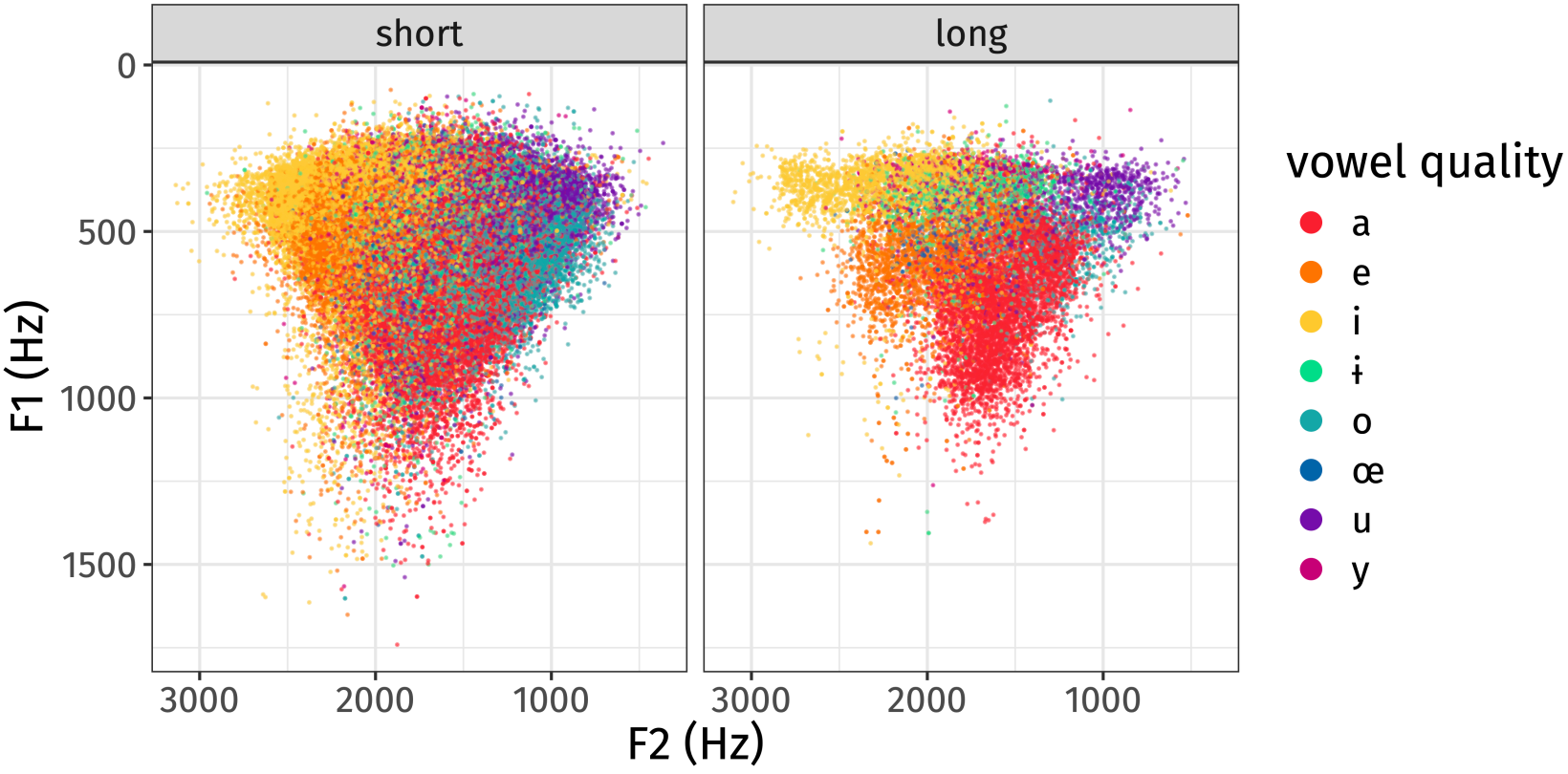
Data quality?



Uncorrected, *z*-score-normalised data.

Try. Automatically remeasure offenders with different ceilings.

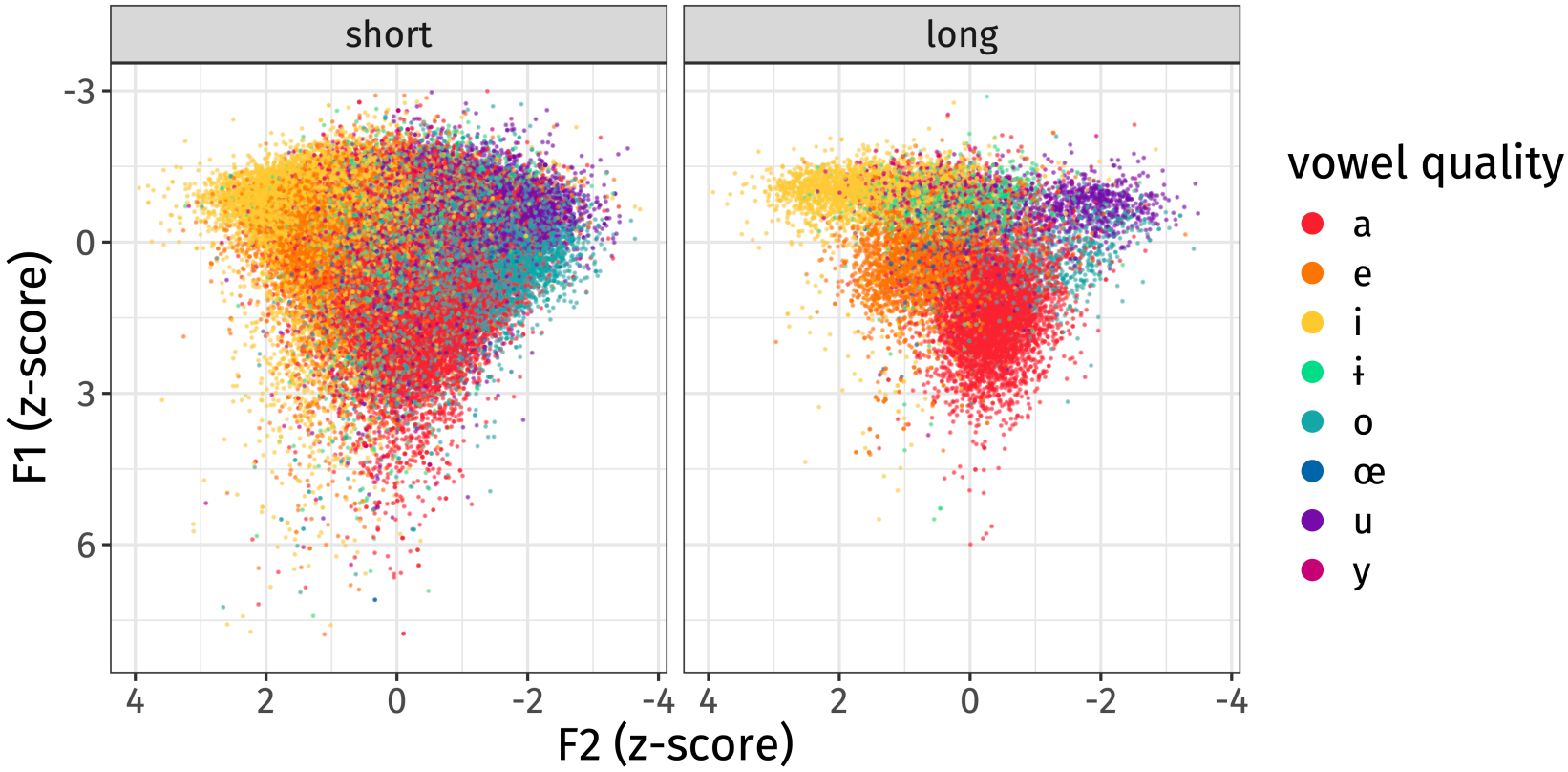
Data quality?



Revised, raw data.

Try. Automatically remeasure offenders with different ceilings.

Data quality?

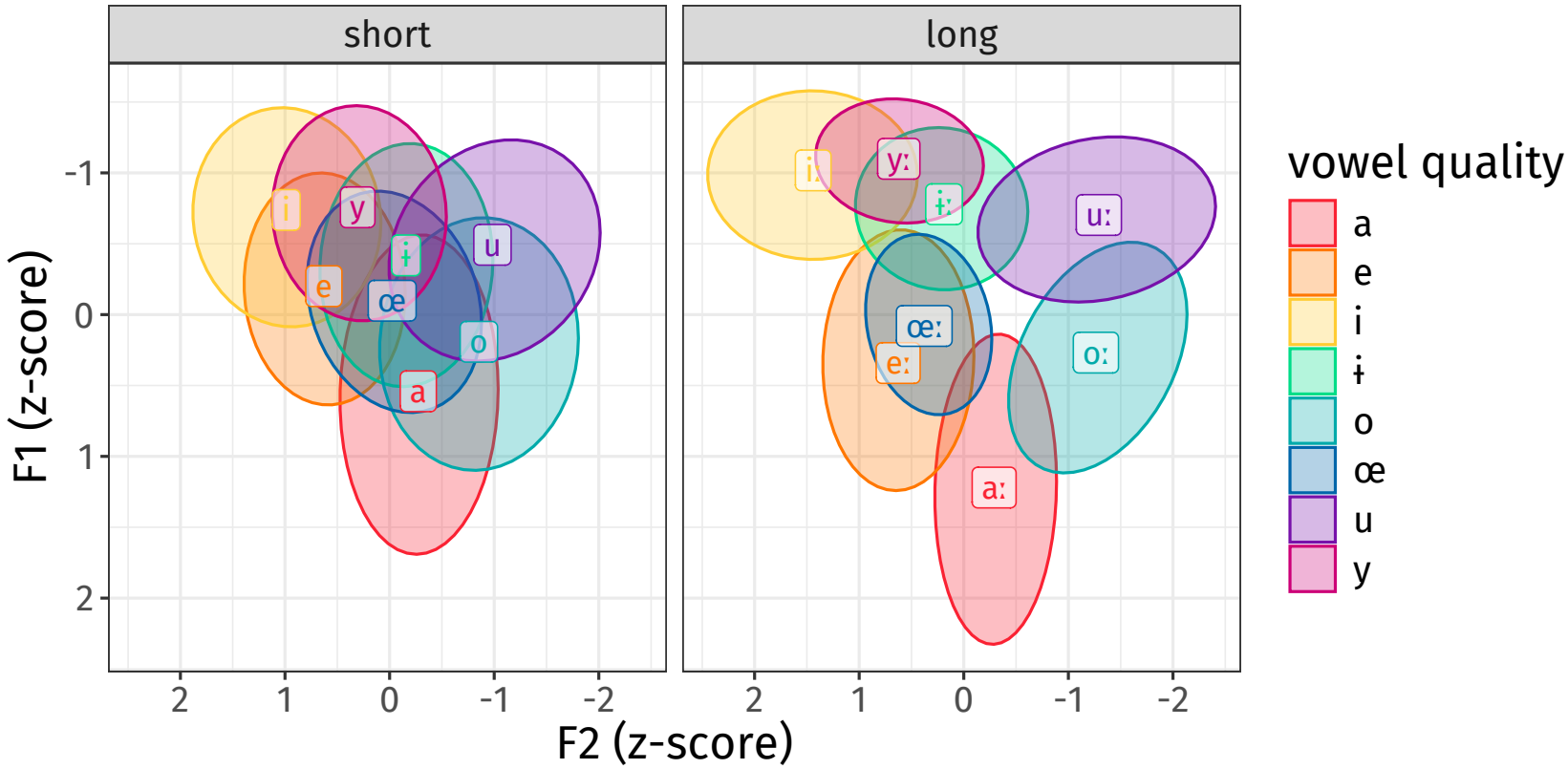


Revised, *z*-score-normalised data.

Result. Remeasured 30% of the data (by percentile) with adaptive ceiling between 4000–7000 Hz (number of formants = 5).

Properties of the vowel space

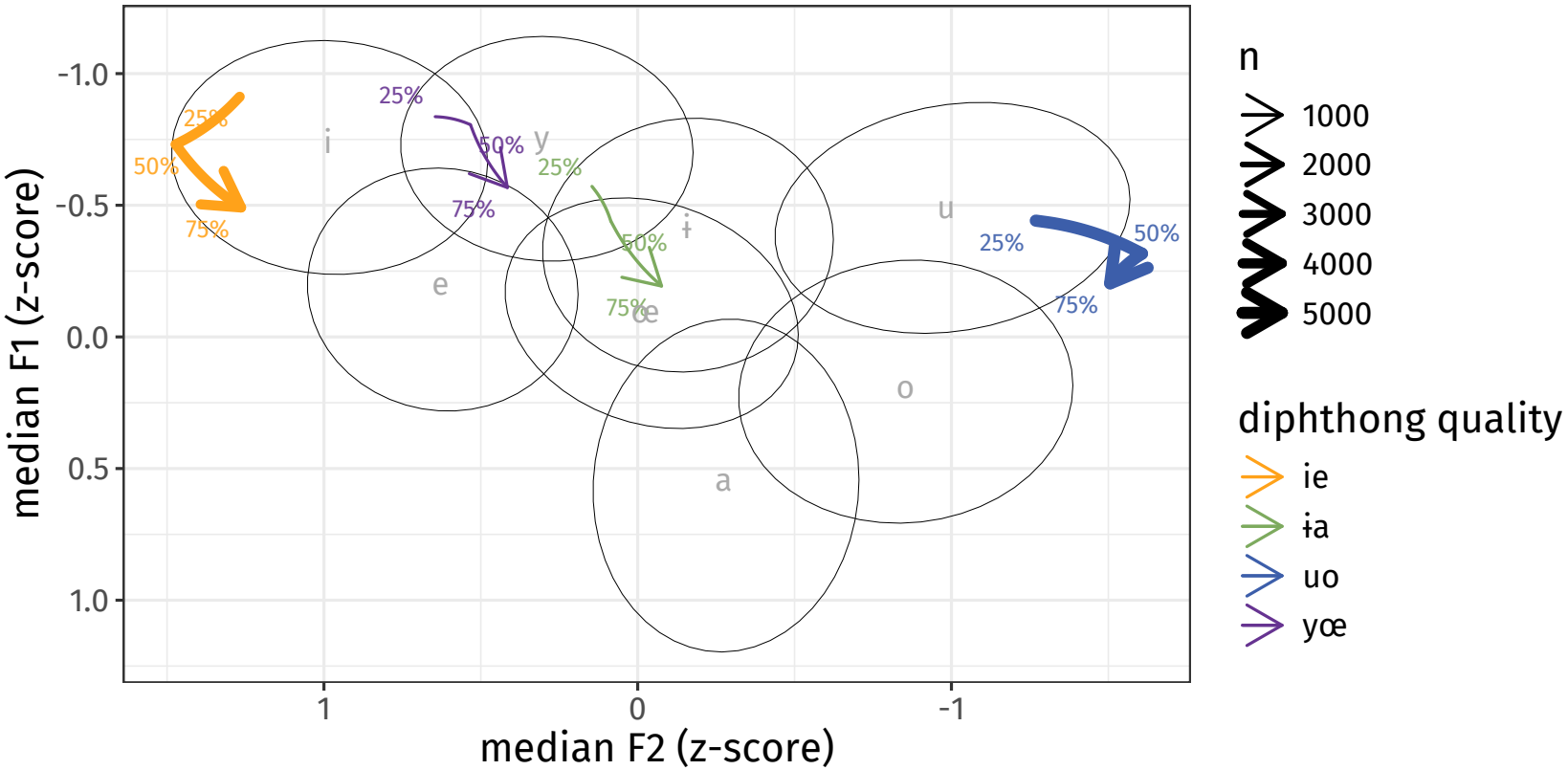
The overall picture



z-score normalised vowel space for monophthongs, 75% confidence.

Properties of the vowel space

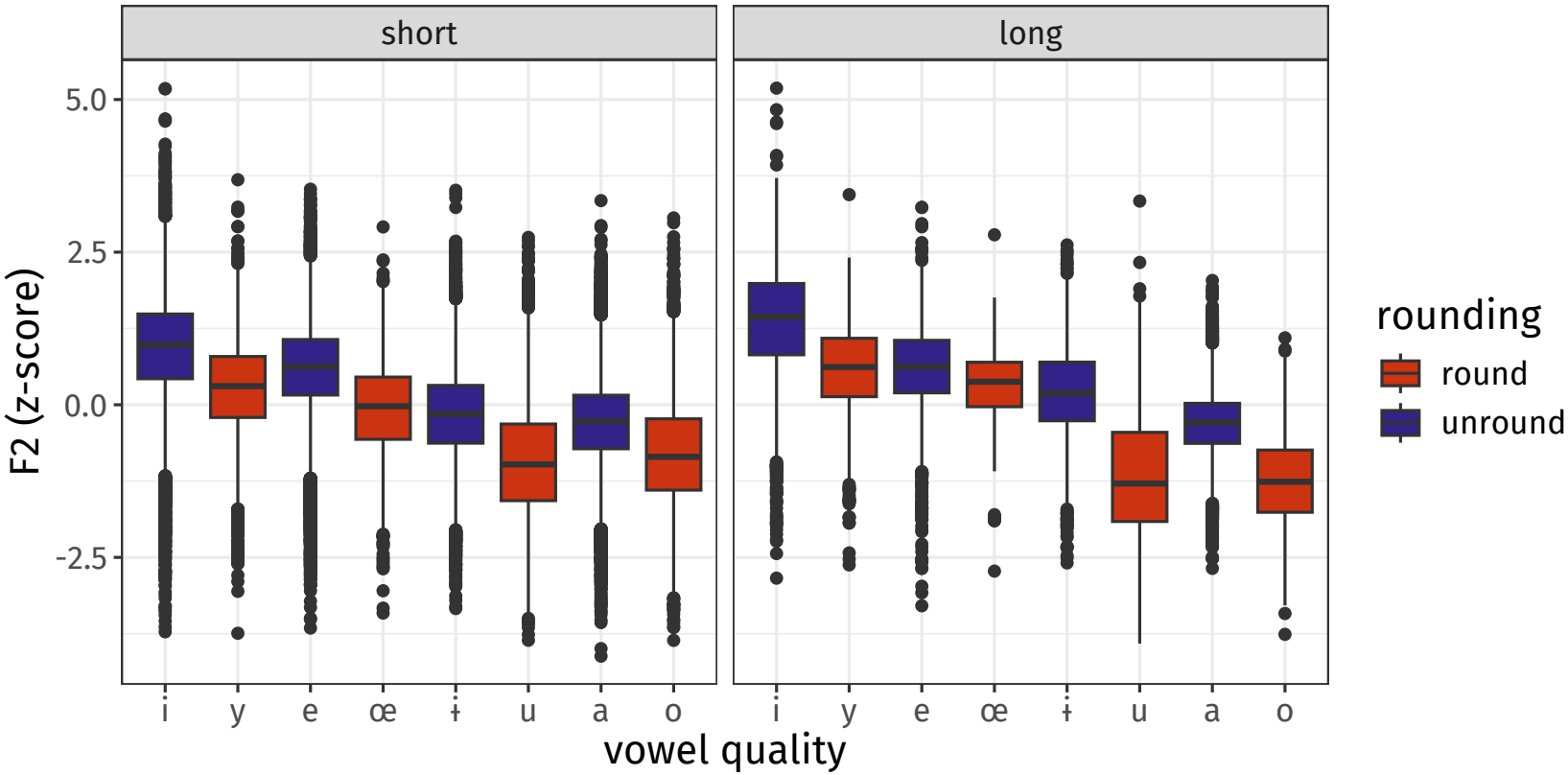
The diphthongs



25%, 50% & 75% means for (normalised) diphthong F1 and F2, shown with short monophthong CIs for reference.

Properties of the vowel space

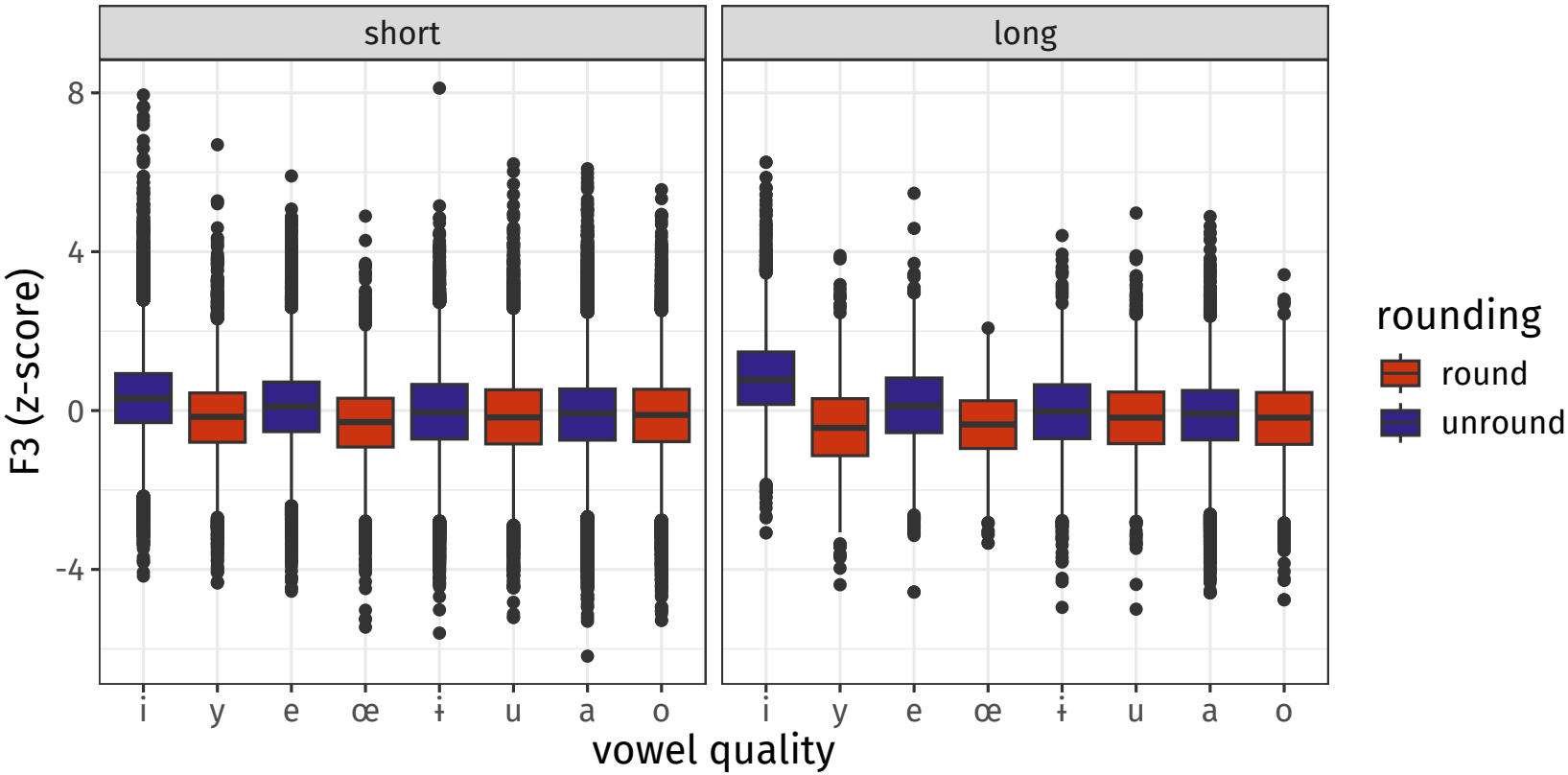
F2 & rounding



F2 better for distinguishing round-unround pairs than F3, as in Crimean Tatar & Kazakh (McCollum & Kavitskaya 2022; McCollum 2015).

Properties of the vowel space

F3 & rounding



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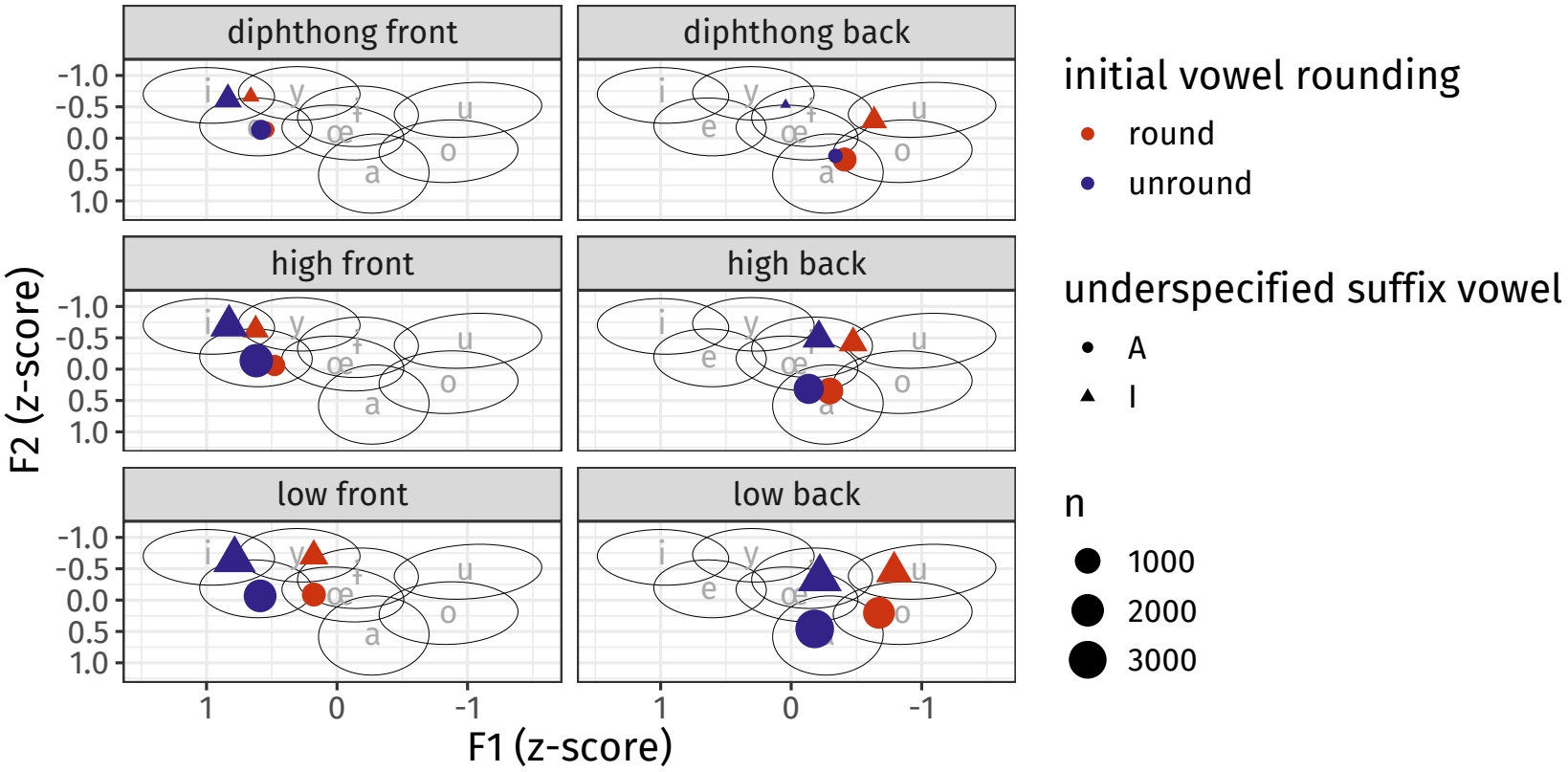
Vowel harmony

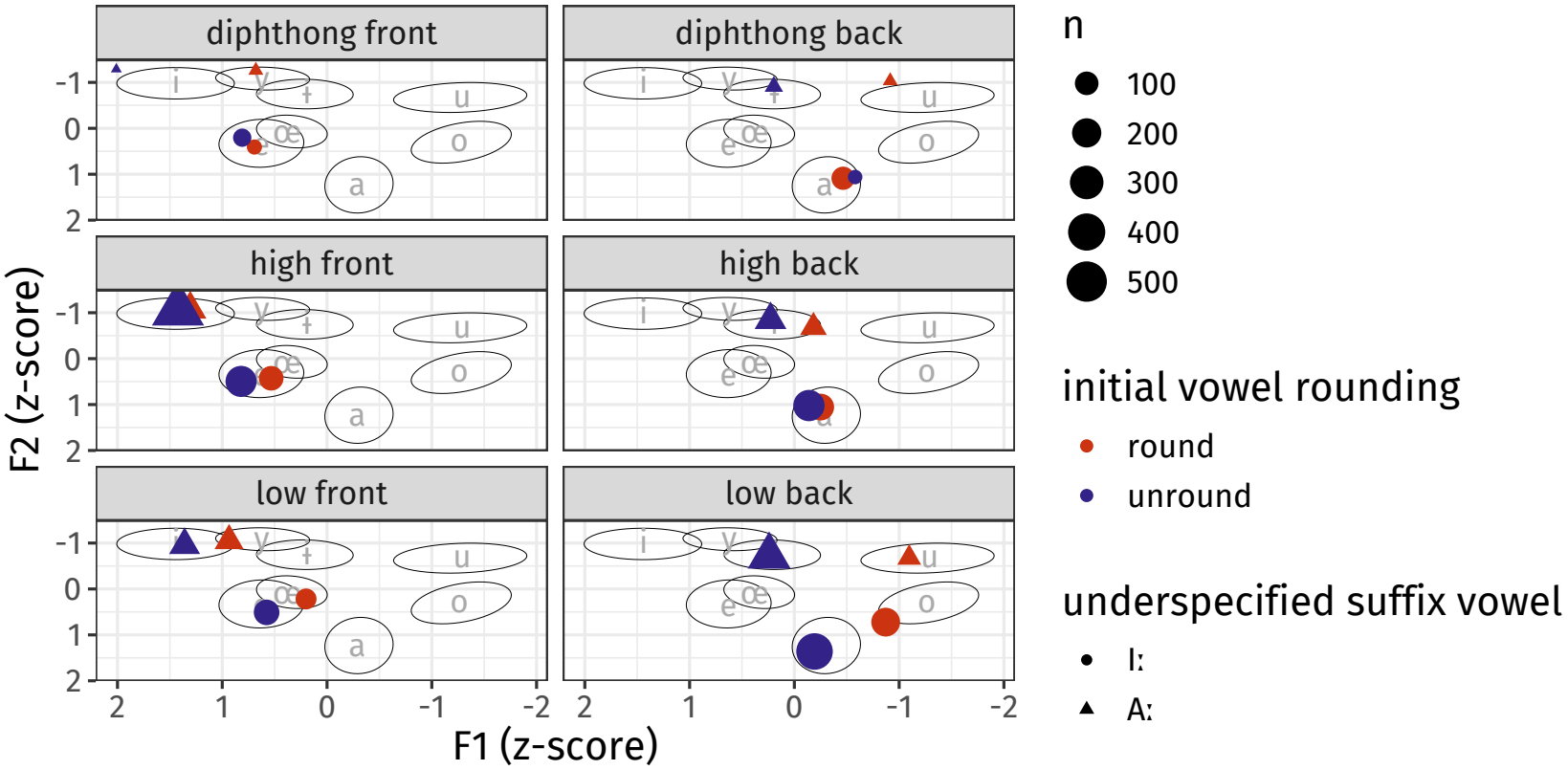
Underspecified short monophthongs in suffixes



Low vowels trigger rounding harmony across the board; **high vowels** are poorer triggers, and can only reliably trigger rounding harmony in high vowels. **Diphthongs pattern with high vowels as triggers of harmony.**

Vowel harmony

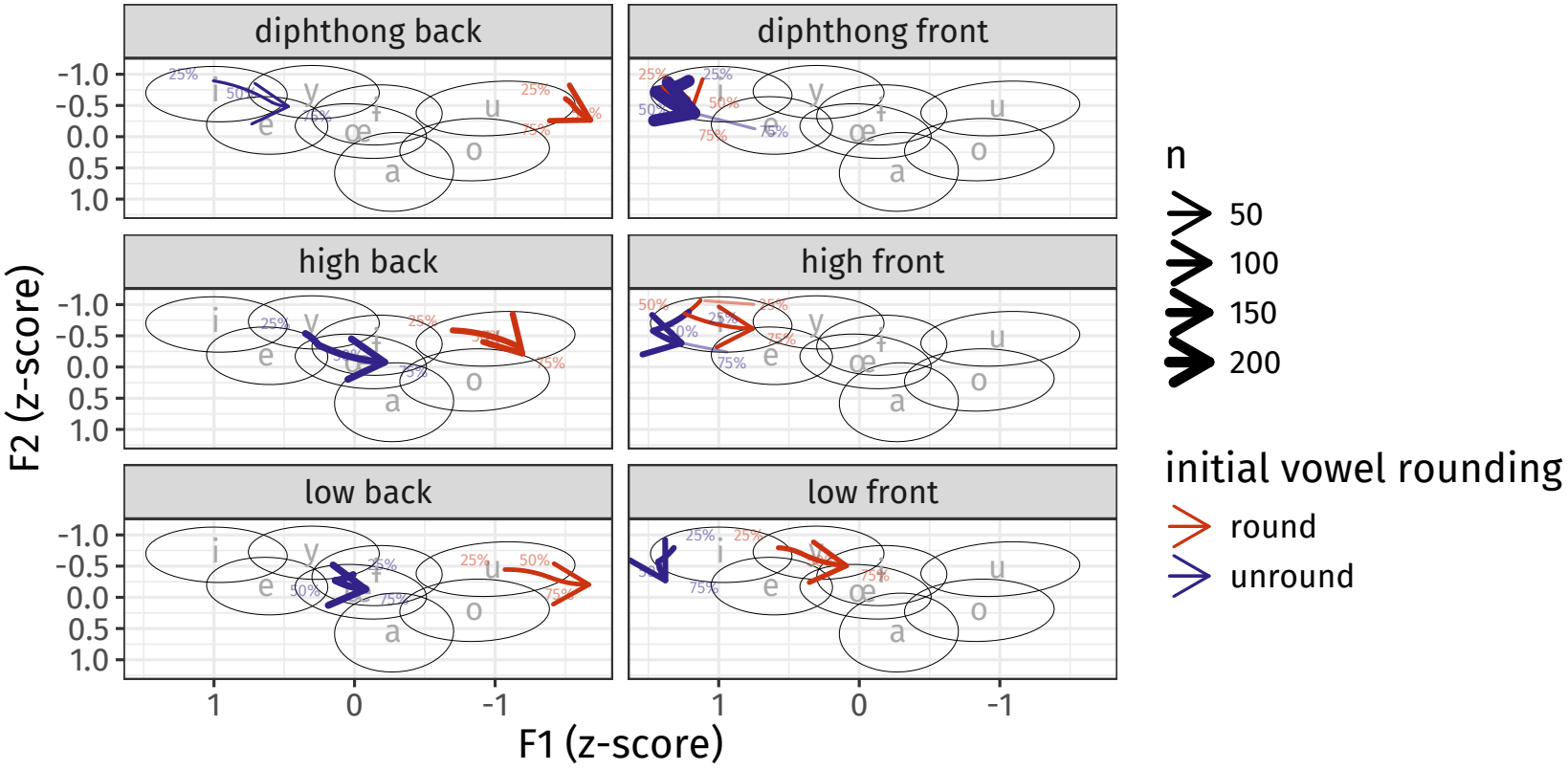
Underspecified long monophthongs in suffixes



Essentially similar patterning in the long vowels.

Vowel harmony

Underspecified diphthongs in suffixes

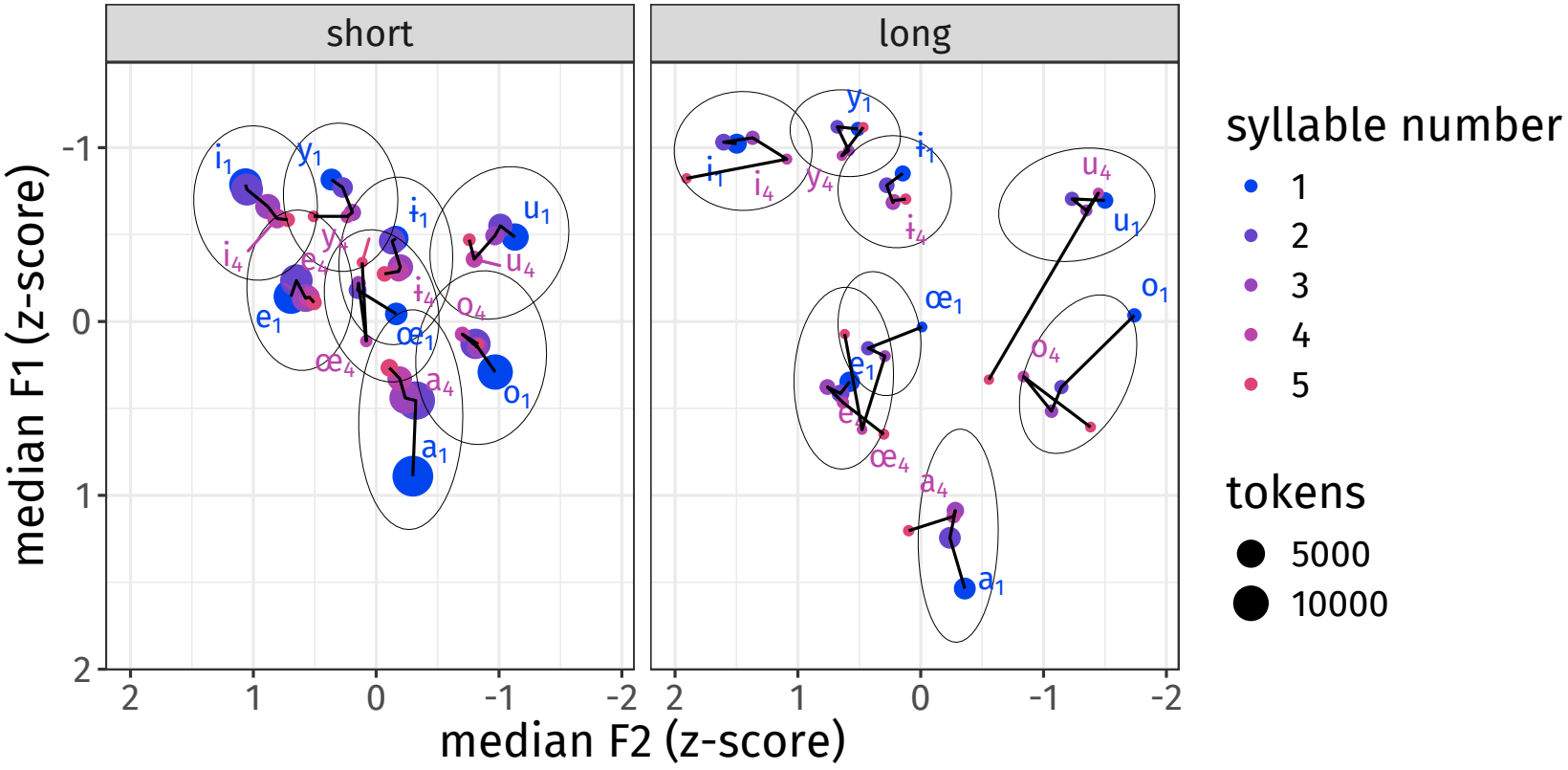


Affixes containing /IA/ underspecified diphthongs undergo harmony across the board (note small token numbers in post-/y/, post-/yœ̯/ position).

Diphthongs pattern with high vowels as targets, too.

Vowel harmony

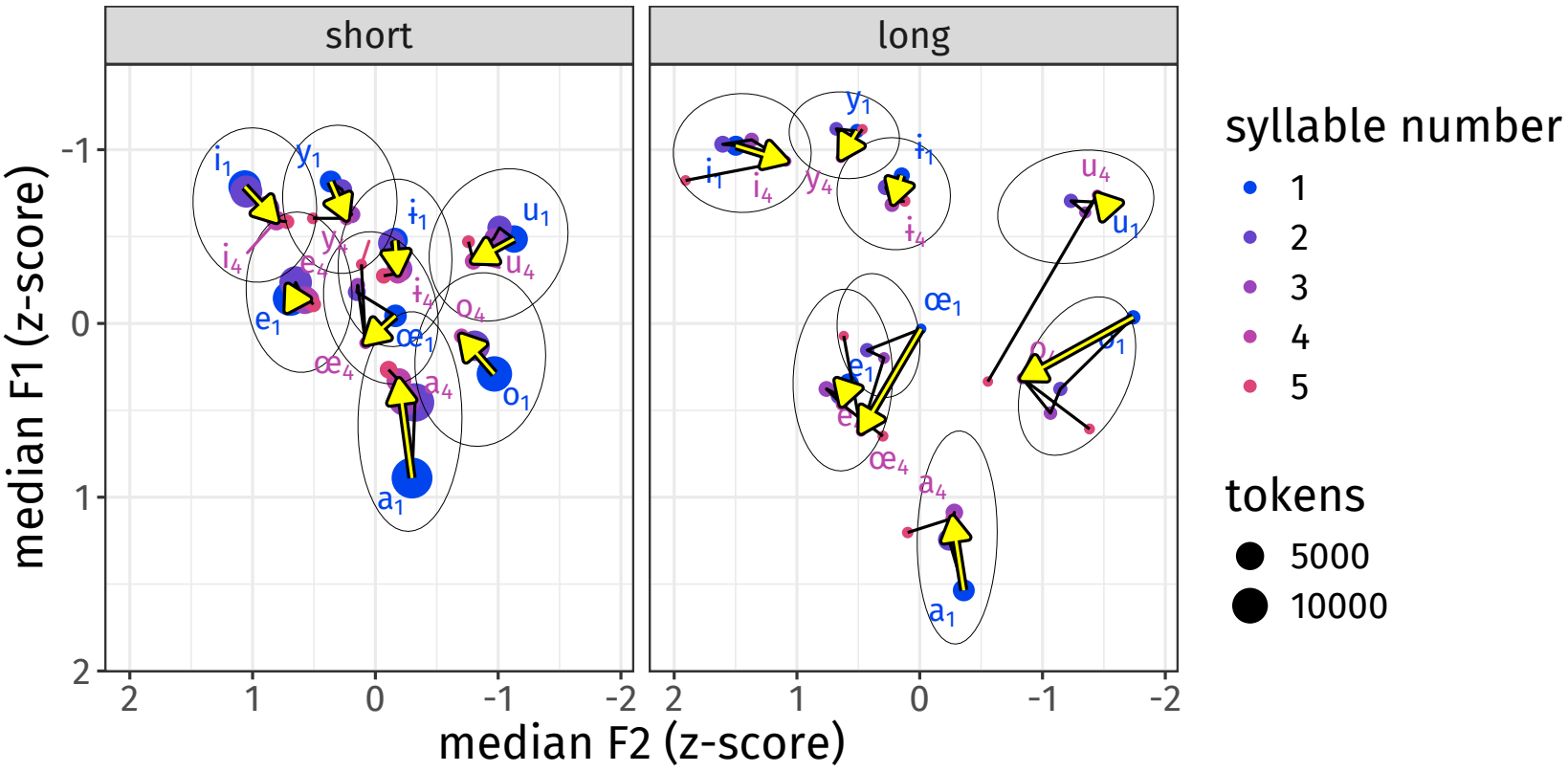
Centralisation & reduction



Short and long vowels organised by position in the word. **Short vowels centralise considerably** with distance from the initial syllable; no such systematic pattern for the long vowels.

Vowel harmony

Centralisation & reduction



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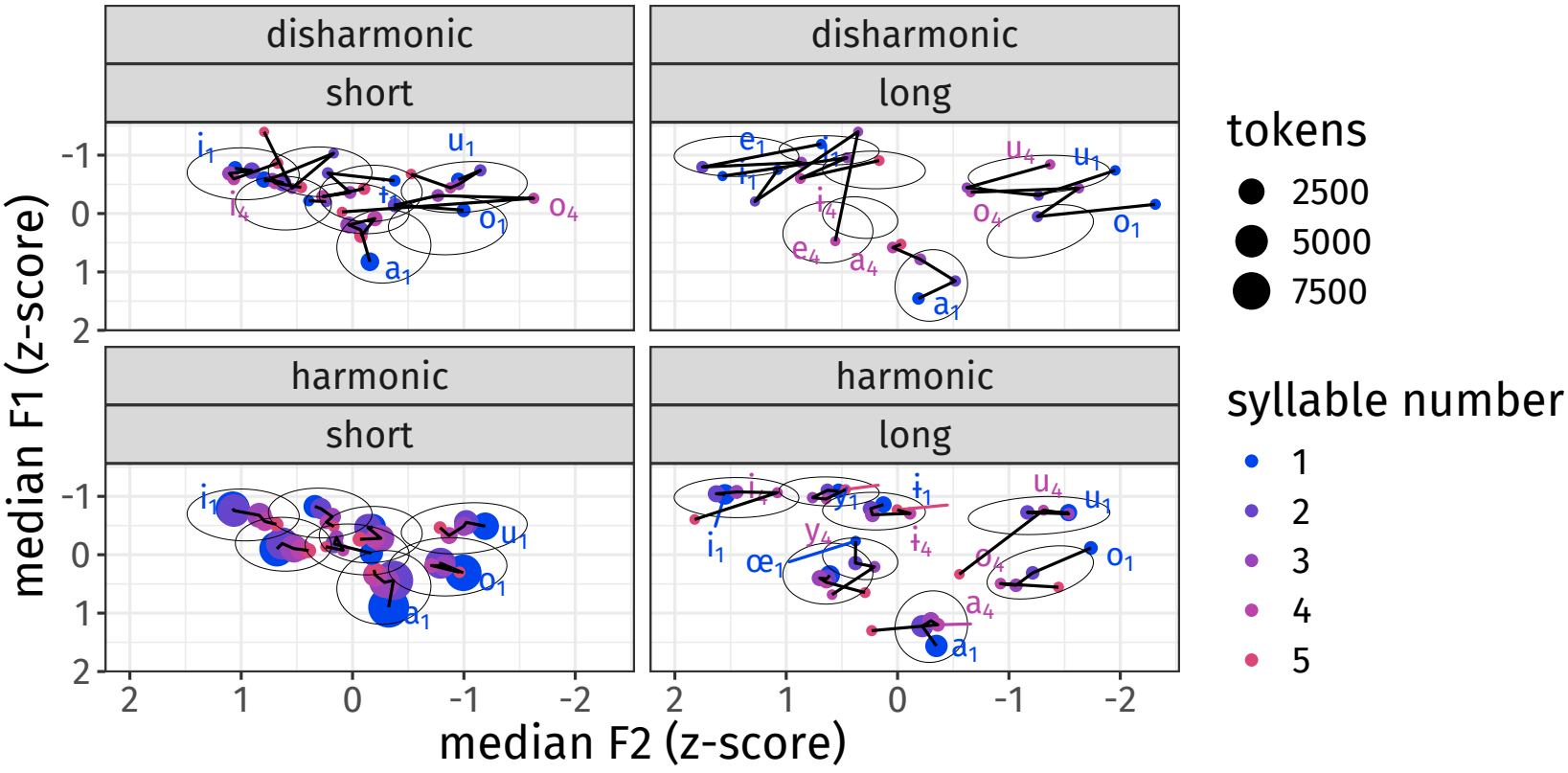

Centralisation is a property of harmonic items; **front-back disharmonic** words don't show it. **Centralisation = predictability.**

Vowel harmony

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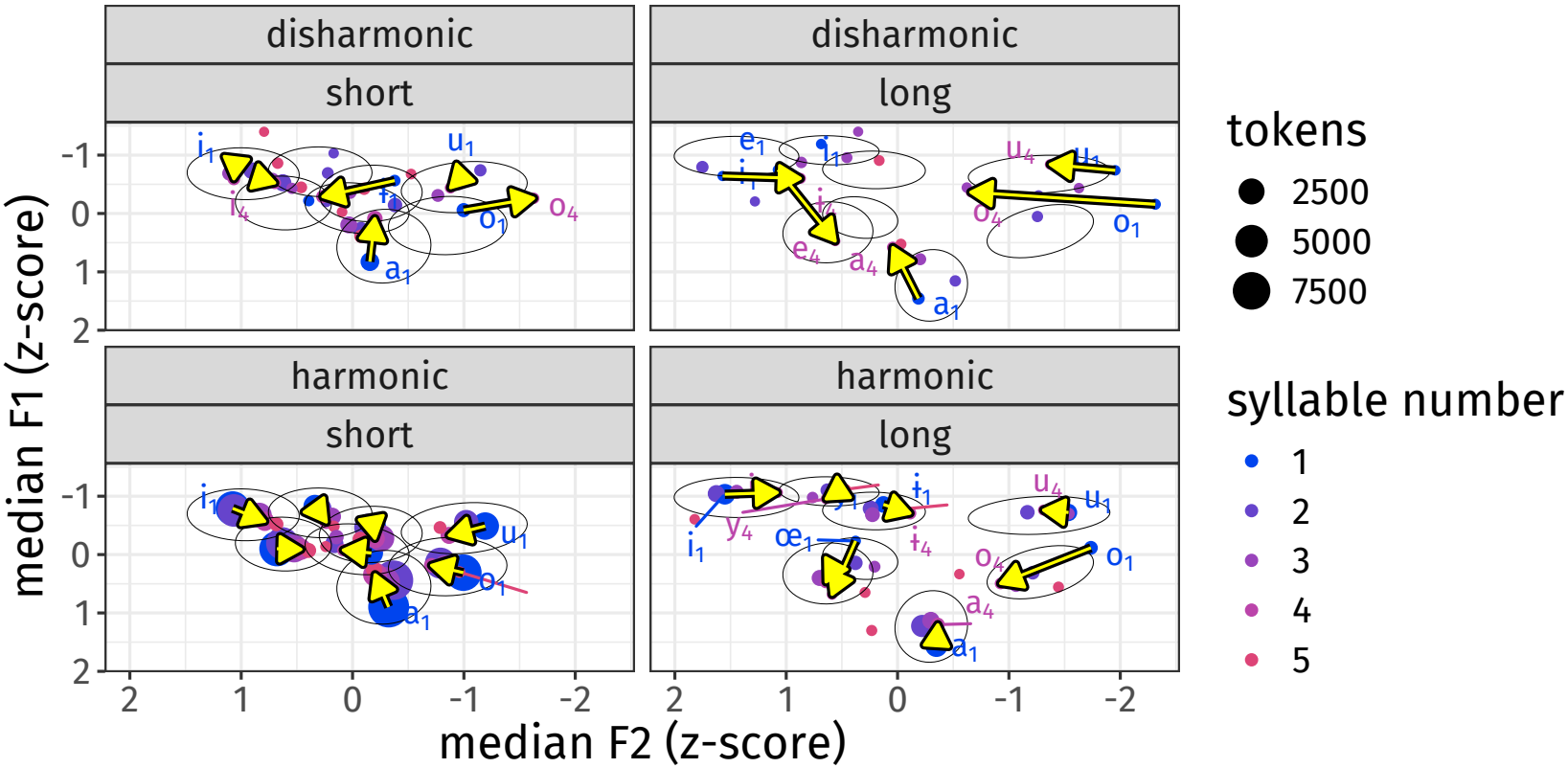

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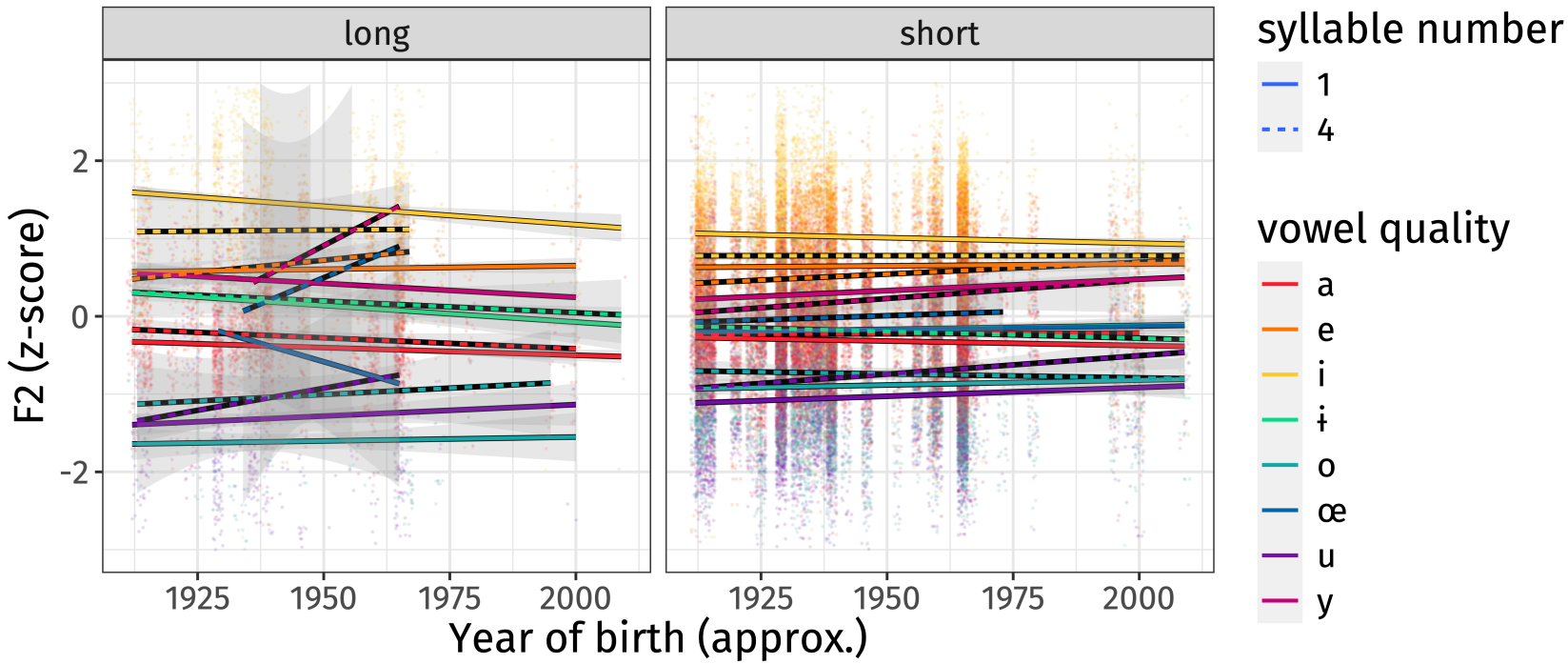
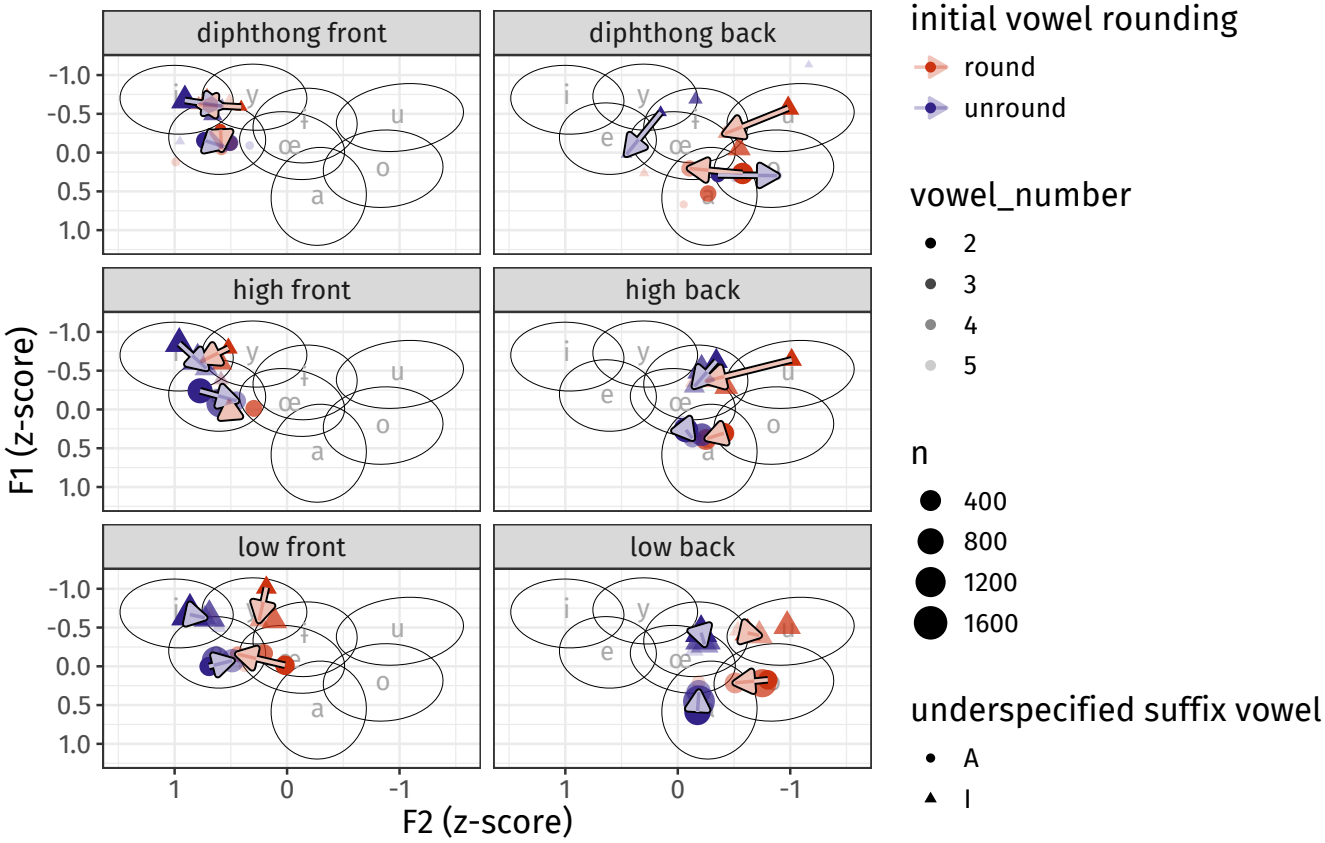


And no *divergence* between syllable-1 and syllable-4 short vowels in apparent time. **Centralisation is stable?**

Vowel harmony

Centralisation & reduction



So does this interact with VH? Distinguishability of A & I by backness and roundness of trigger in good shape until syllable 5, after which arguably driven more by dropoff in token numbers than by phonology. → **Not much.**

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- There is some *gradience*: backness and rounding do drop off as suffixes get further from the trigger, in line with reports from many other Turkic languages. But not enough to seriously threaten the system itself.
- There is plenty of *disharmony* in the lexicon, but it doesn't do anything.
- **Why does this work?**

Summary & outlook

- **Dolgan is a boring, generic Turkic language with stable backness and rounding harmony. Why?**

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- **This is work in progress — further ideas very welcome!**

[pasʲibalaːt͡ʃːɨɬar]!

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‘The trajectory and distributional typology of phonological change’.

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