

Slovak Vowel Phonotactics: Slavic Origins vs. Hungarian Influences

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METHODOLOGY

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Fonetika je časť jazykovedy, ktorá sa zaoberá procesmi zvukovej reči [...]

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Vowel on position 1: /o/

Vowel on position 2: /e/

Bigram: /o/-/e/

Methodology

Fonetika je časť jazykovedy, ktorá sa zaoberá procesmi zvukovej reči [...]

Vowel on position 1: /o/; /e/

Vowel on position 2: /e/; /i/

Bigram: /o/-/e/; /e/-/i/

Methodology

Fonetika je časť jazykovedy, ktorá sa zaoberá procesmi zvukovej reči [...]

Vowel on position 1: /o/; /e/; /i/

Vowel on position 2: /e/; /i/; /a/

Bigram: /o/-/e/; /e/-/i/; /i/-/a/

Metric

$$f(a; b) = \frac{F(a; b)}{\sum F}$$

Relative frequency of the bigram (a;b) is equal to absolute frequency of the bigram (a;b) divided by number of all bigrams.

Metric

$$f'(a; b) = f_1(a)f_2(b)$$

Theoretical relative frequency of the bigram (a;b) is equal to the product of relative frequency of the vowel (a) on the first position and the relative frequency of the vowel (b) on the second position.

Metrics

$$R = \frac{f(a; b)}{f'(a; b)}$$

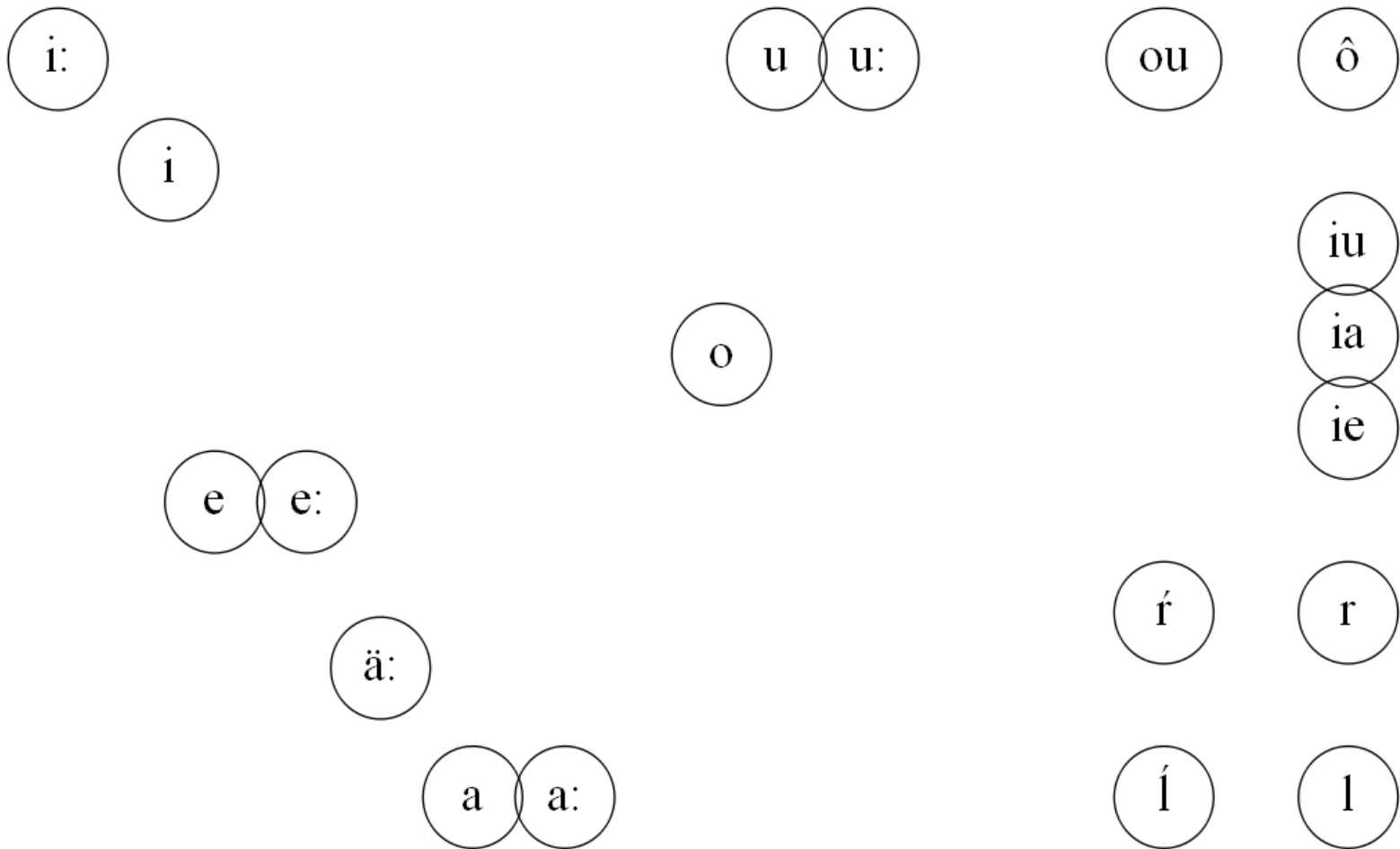
The metrics R is calculated as a ratio of the measured relative frequency of the bigram to the theoretical value.

Metric

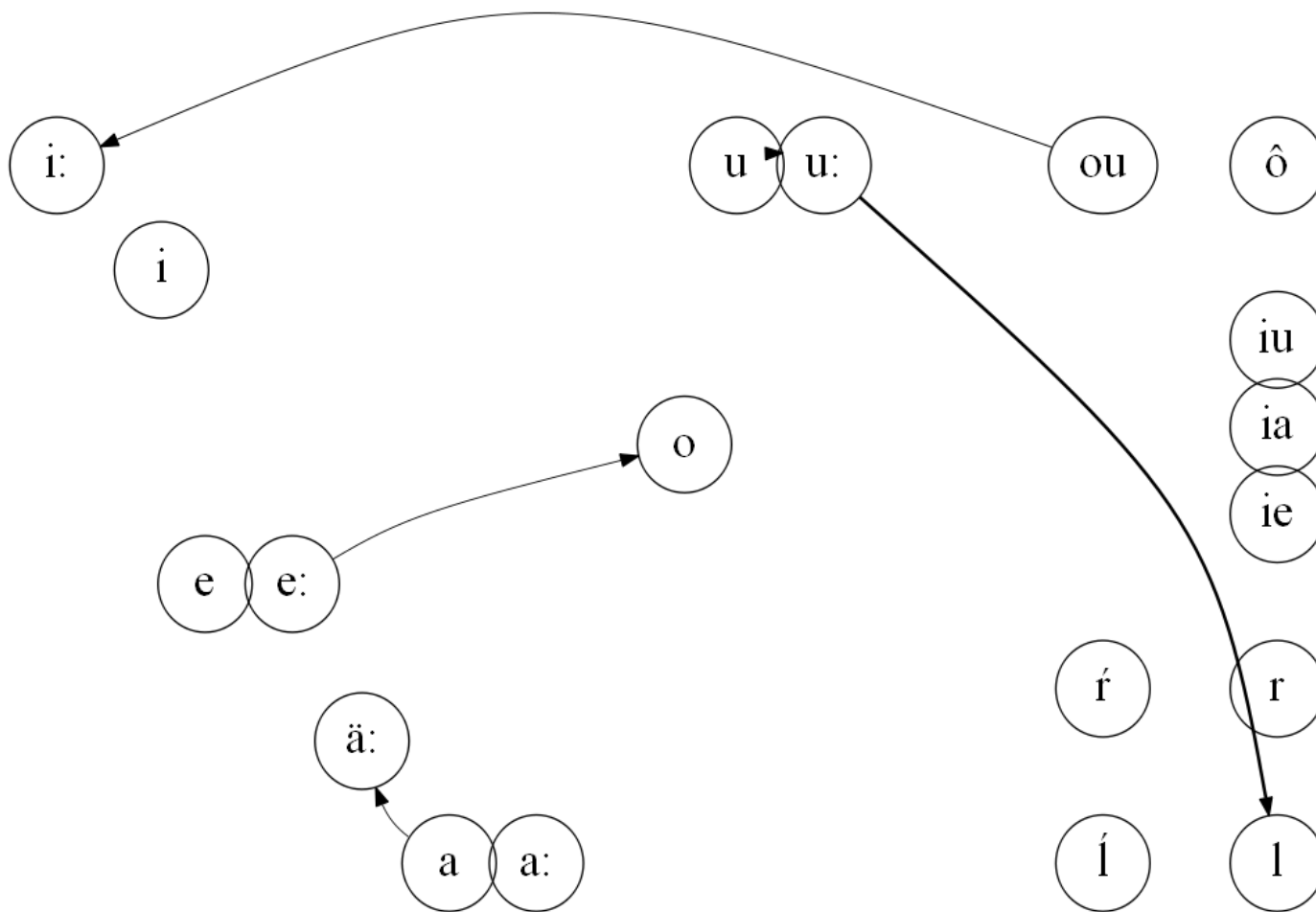
- The metric is easy to interpret:
more than 1 => the bigram is overrepresented
less than 1 => the bigram is underrepresented
- Due to the corpus size the absolute frequencies of the vowels and bigrams are huge => the confidence intervals are in all cases small (we will not show them in the analyses).

RESULTS

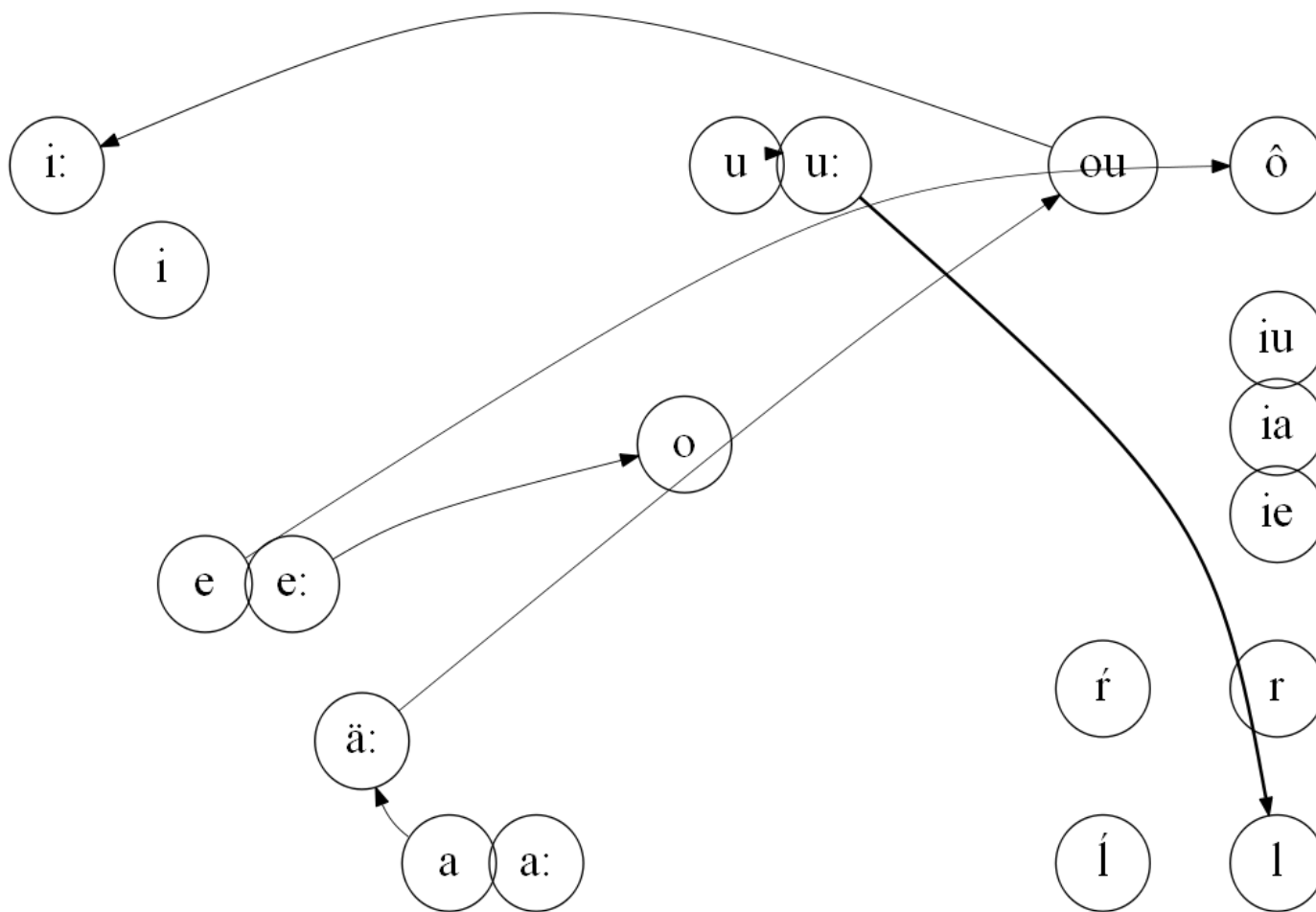
Results – Slovak



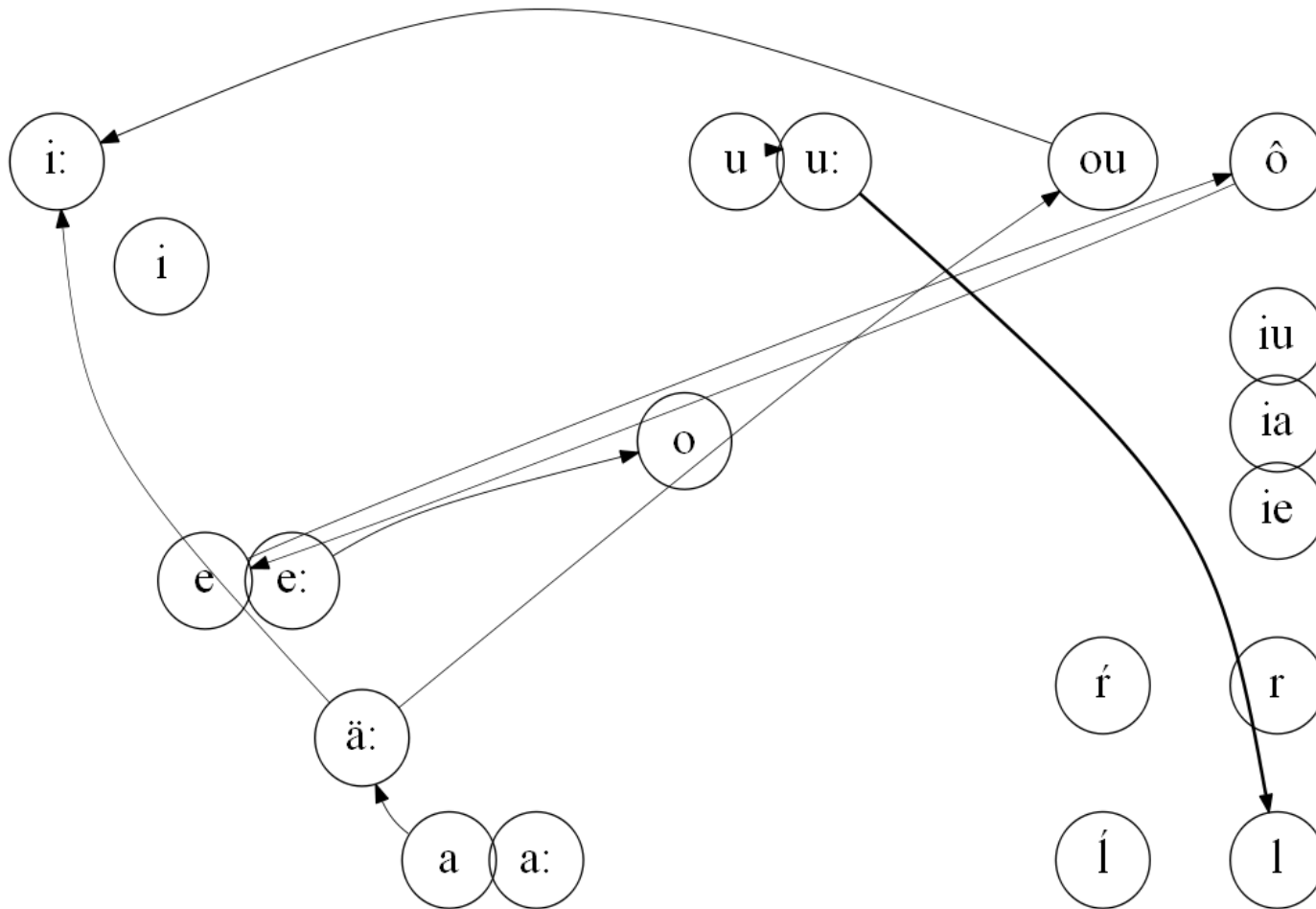
Slovak – Overrepresented (R>2)



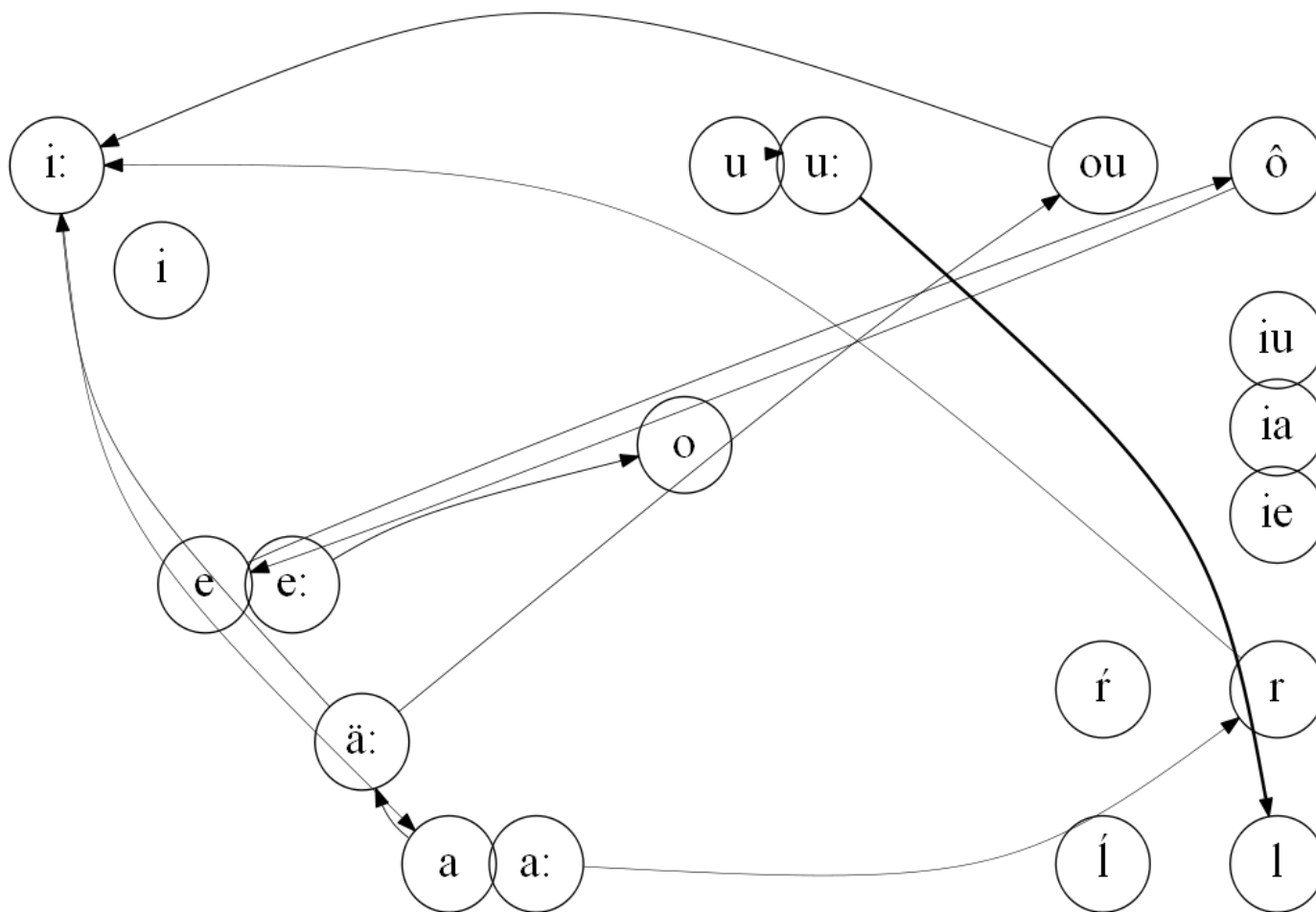
Slovak – Overrepresented (R>1.6)



Slovak – Overrepresented (R>1.4)



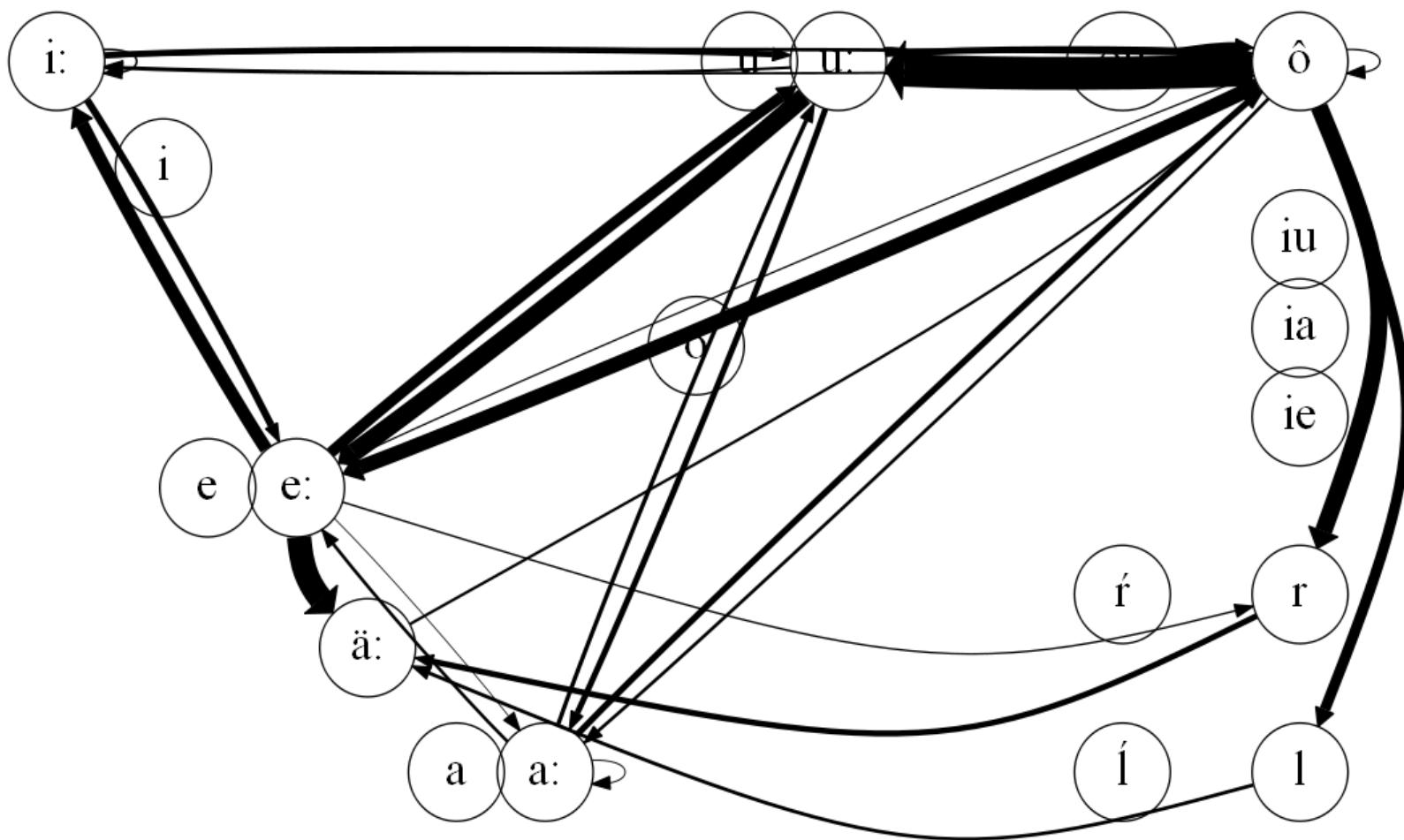
Slovak – Overrepresented (R>1.2)



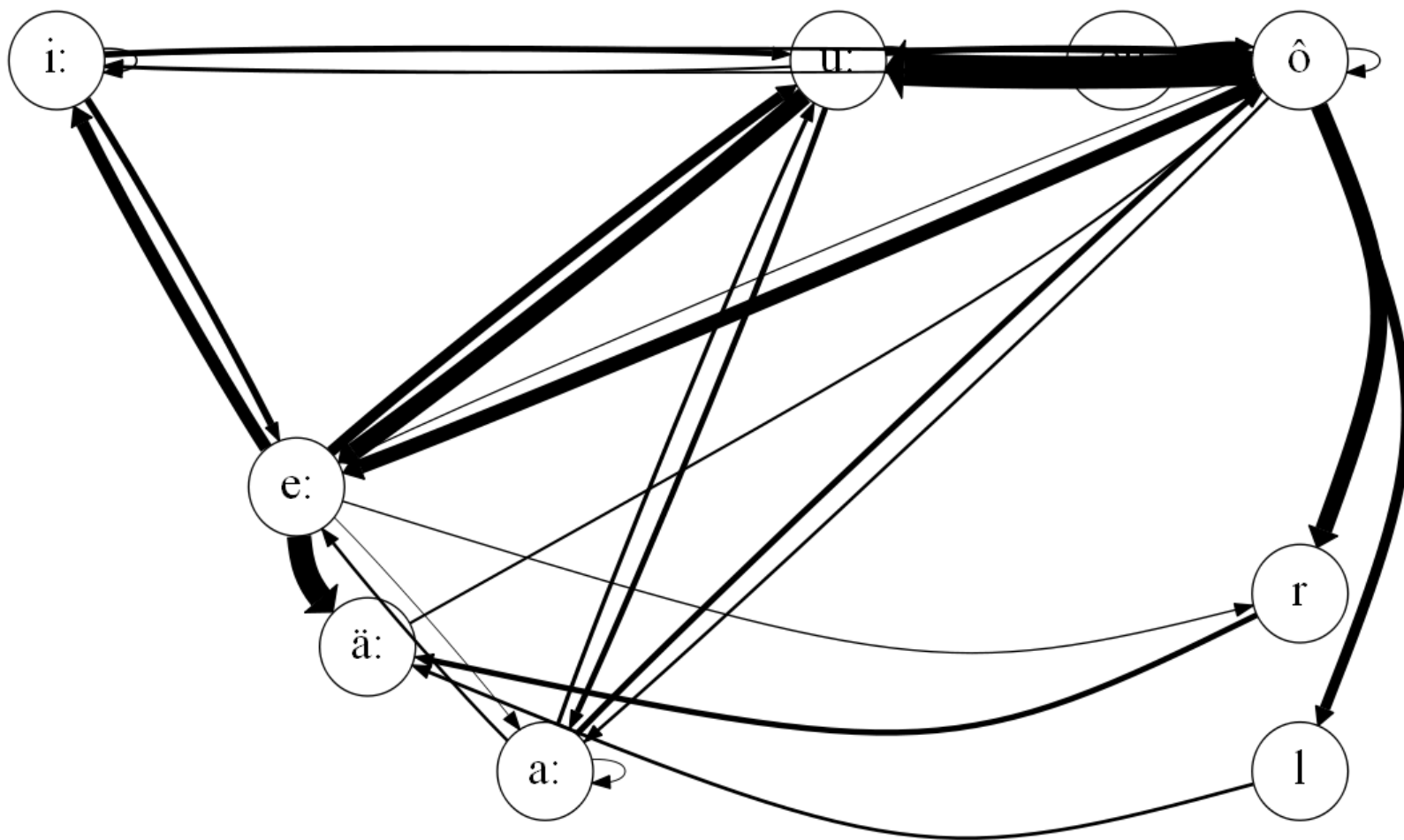
Slovak– Underrepresented (R<0.4)



Slovak– Underrepresented (R<0.4)



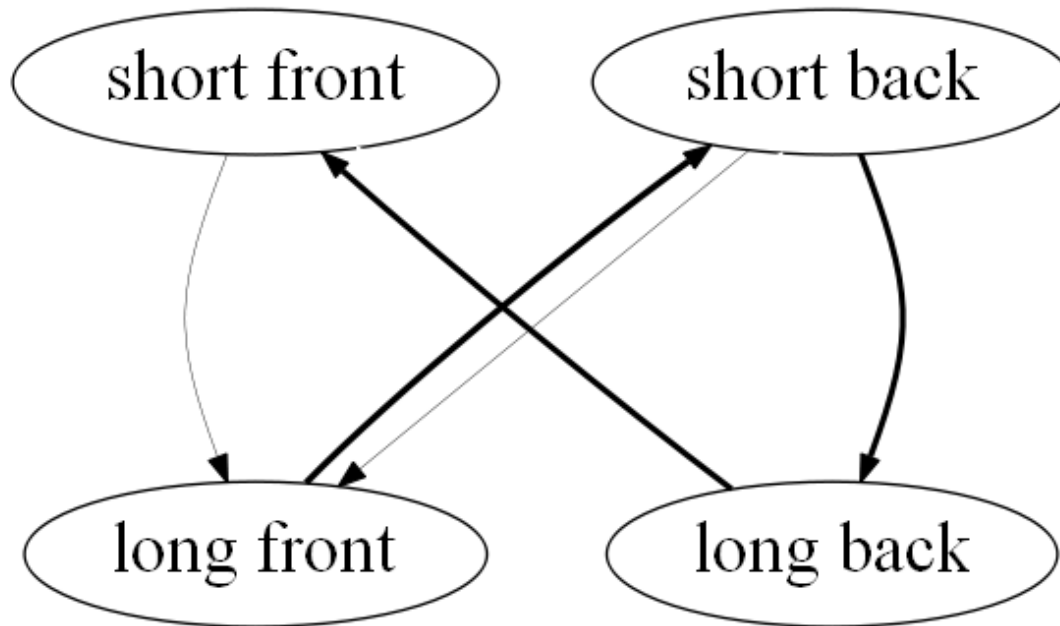
Slovak– Underrepresented ($R < 0.4$)



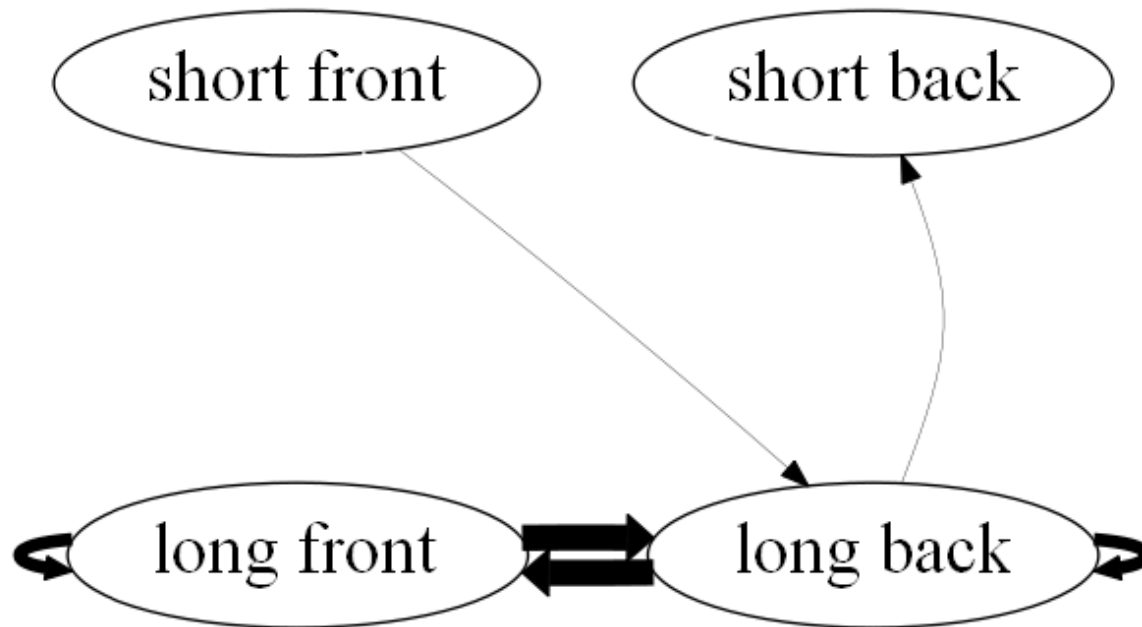
Slovak Vowel Phonotactics (no /a/, /á/)

		Front		Back	
		Short	Long	Short	Long
Front	Short	0.99	1.10	0.98	0.79
	Long	0.96	0.01	1.53	0.00
Back	Short	0.99	1.11	0.94	1.41
	Long	1.49	0.01	0.87	0.00

Slovak Vowel Phonotactics (Positive)



Slovak Vowel Phonotactics (Negative)



Results: Czech

i:

i

u u:

ou

ɪ

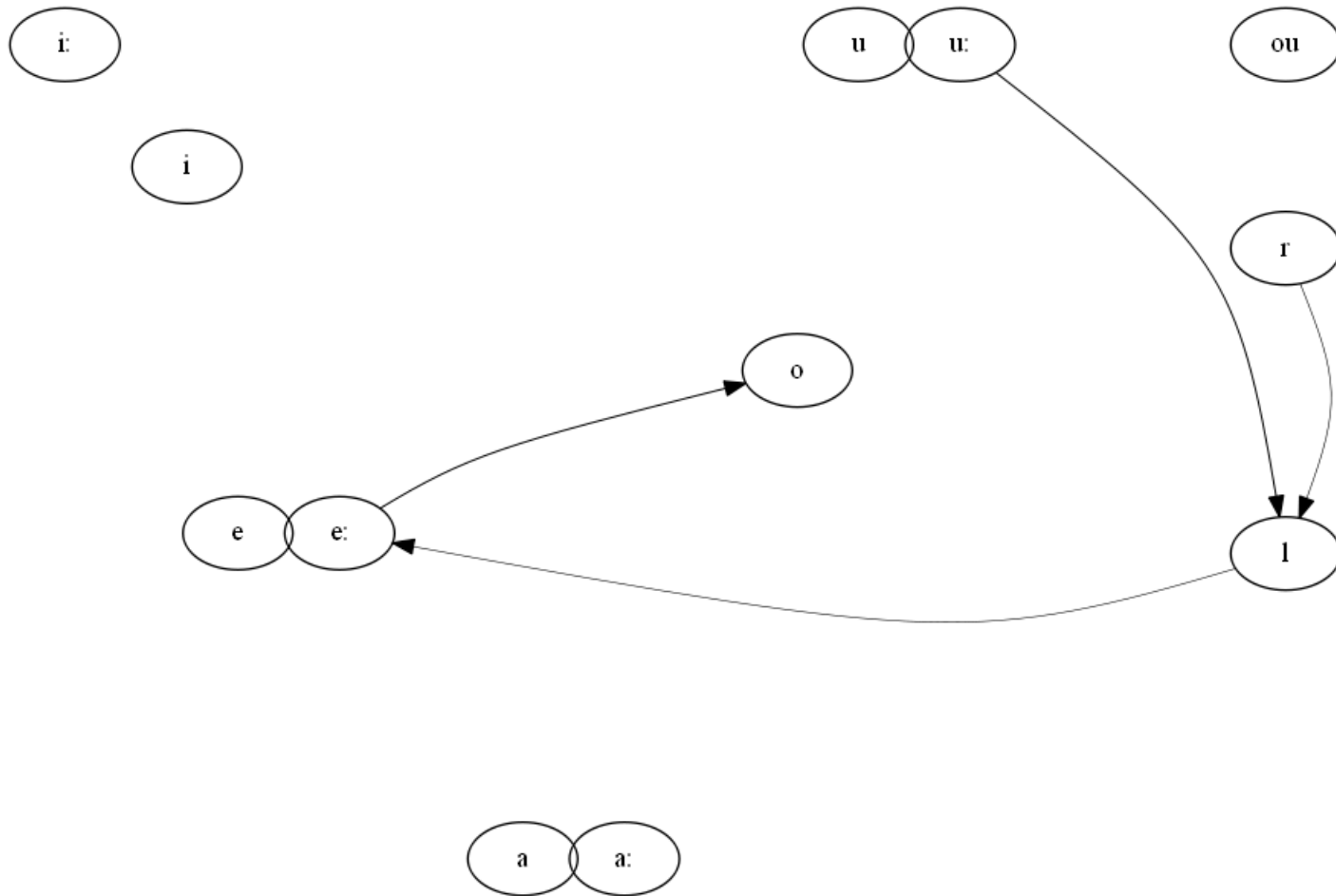
o

e e:

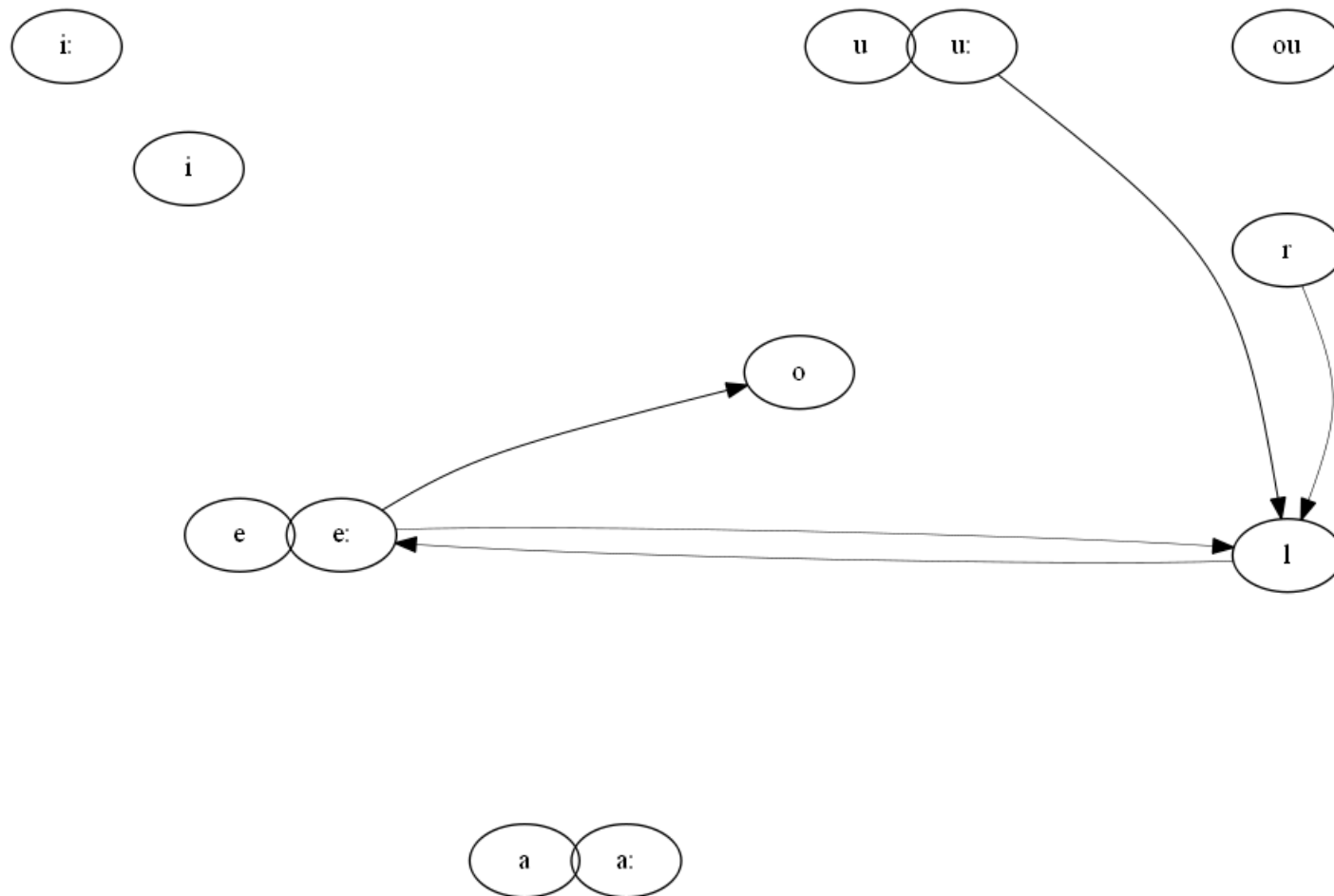
l

a a:

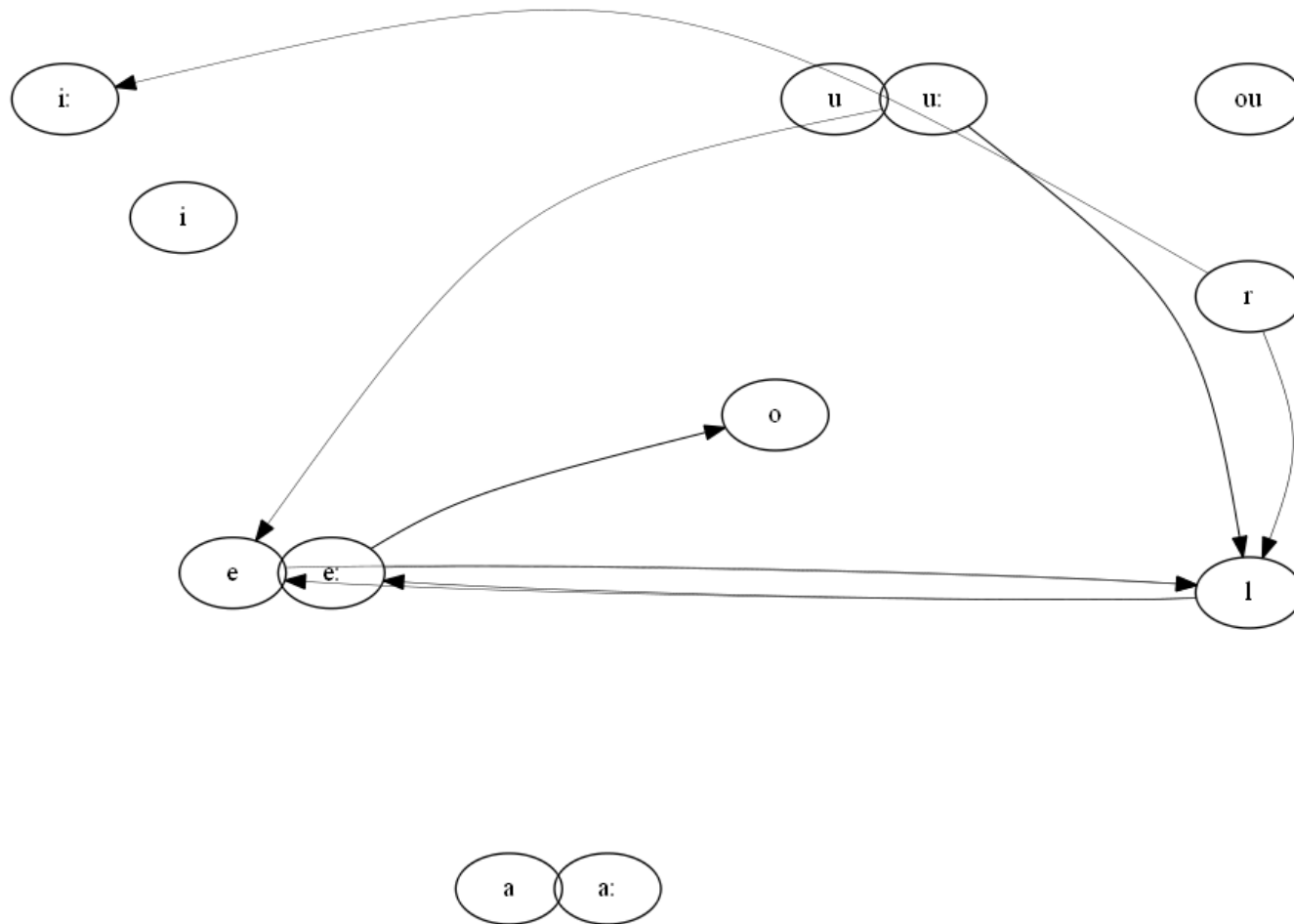
Czech – Overrepresented (R>2)



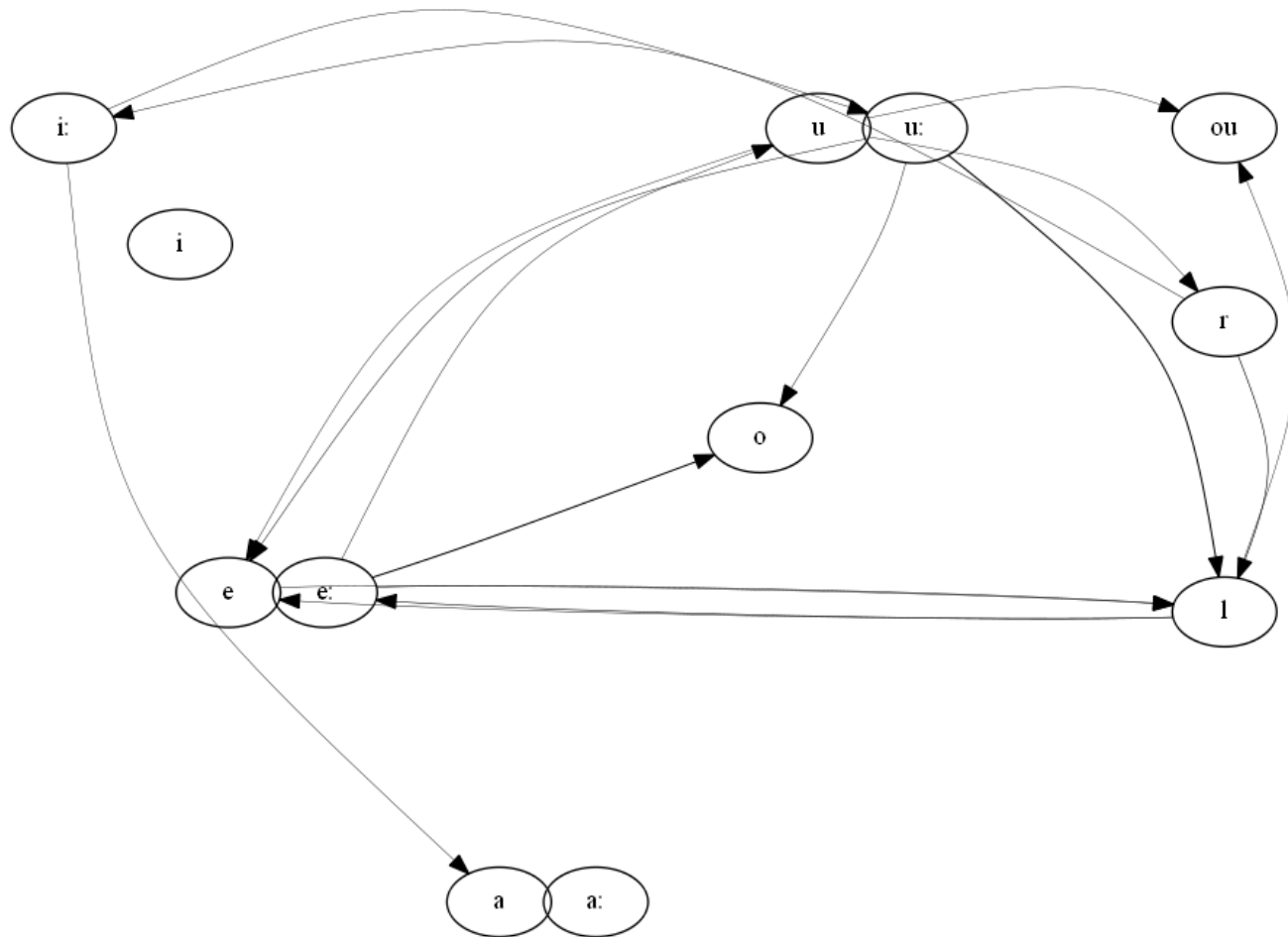
Czech – Overrepresented ($R > 1.8$)



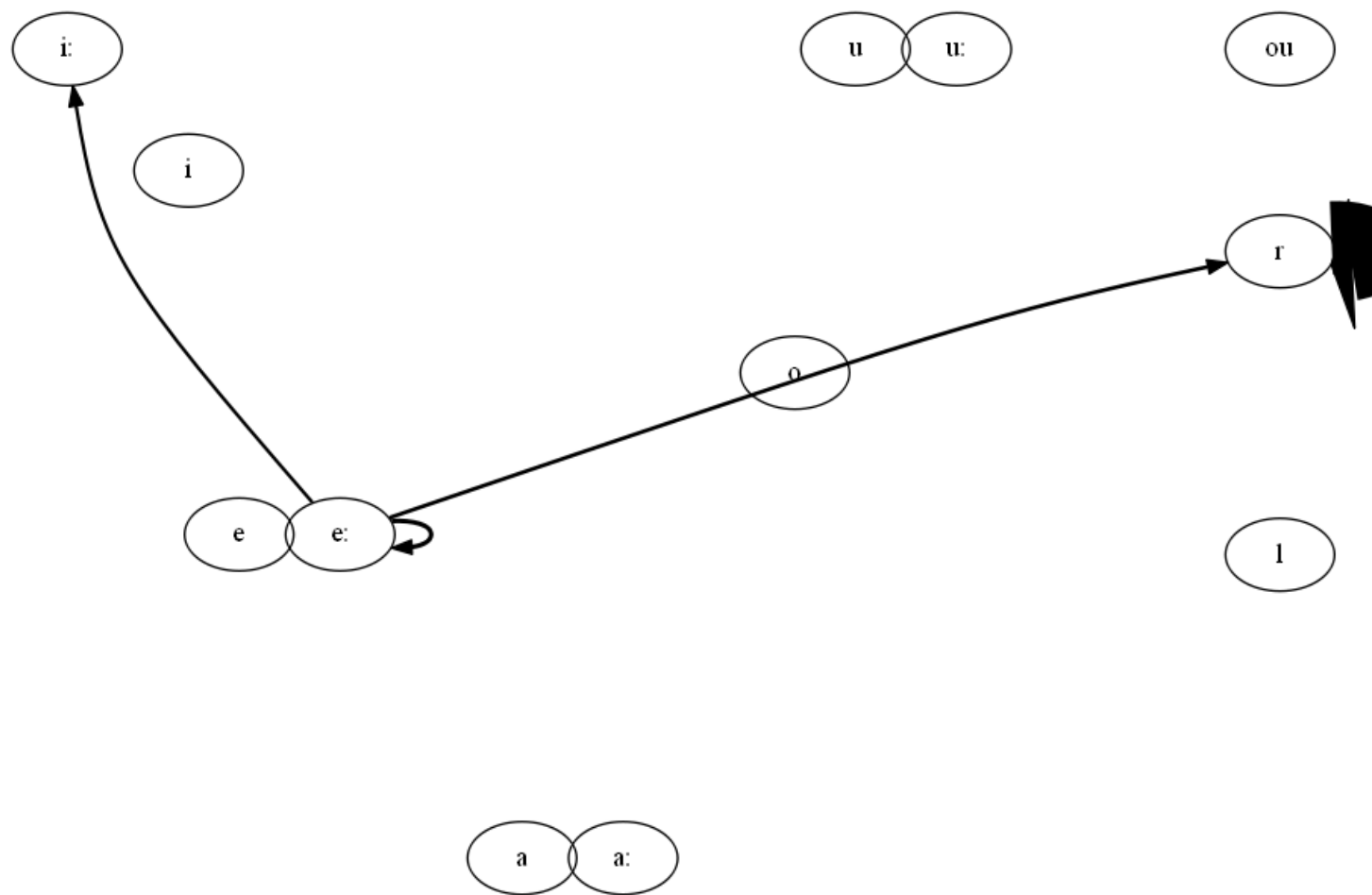
Czech – Overrepresented ($R > 1.6$)



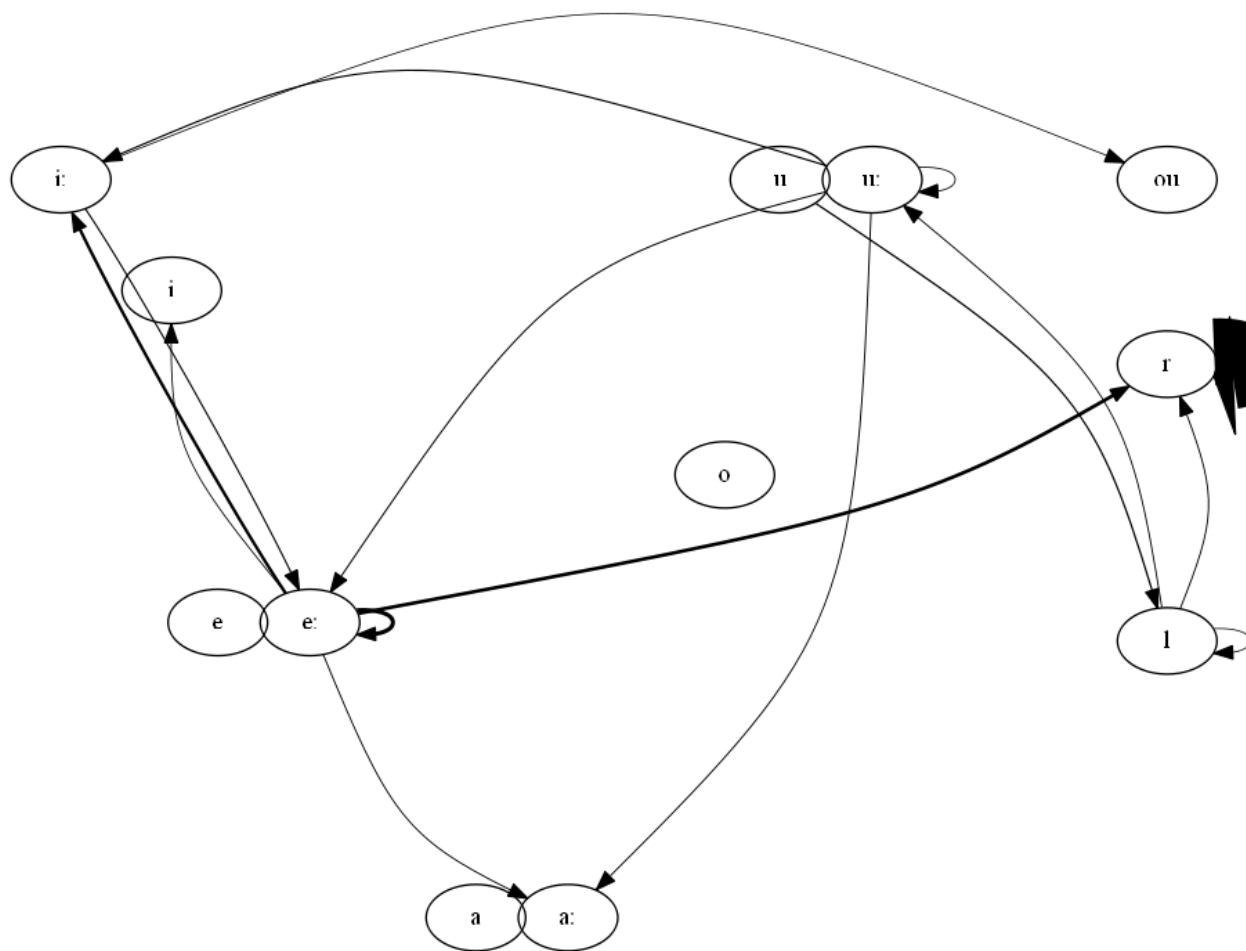
Czech – Overrepresented (R>1.4)



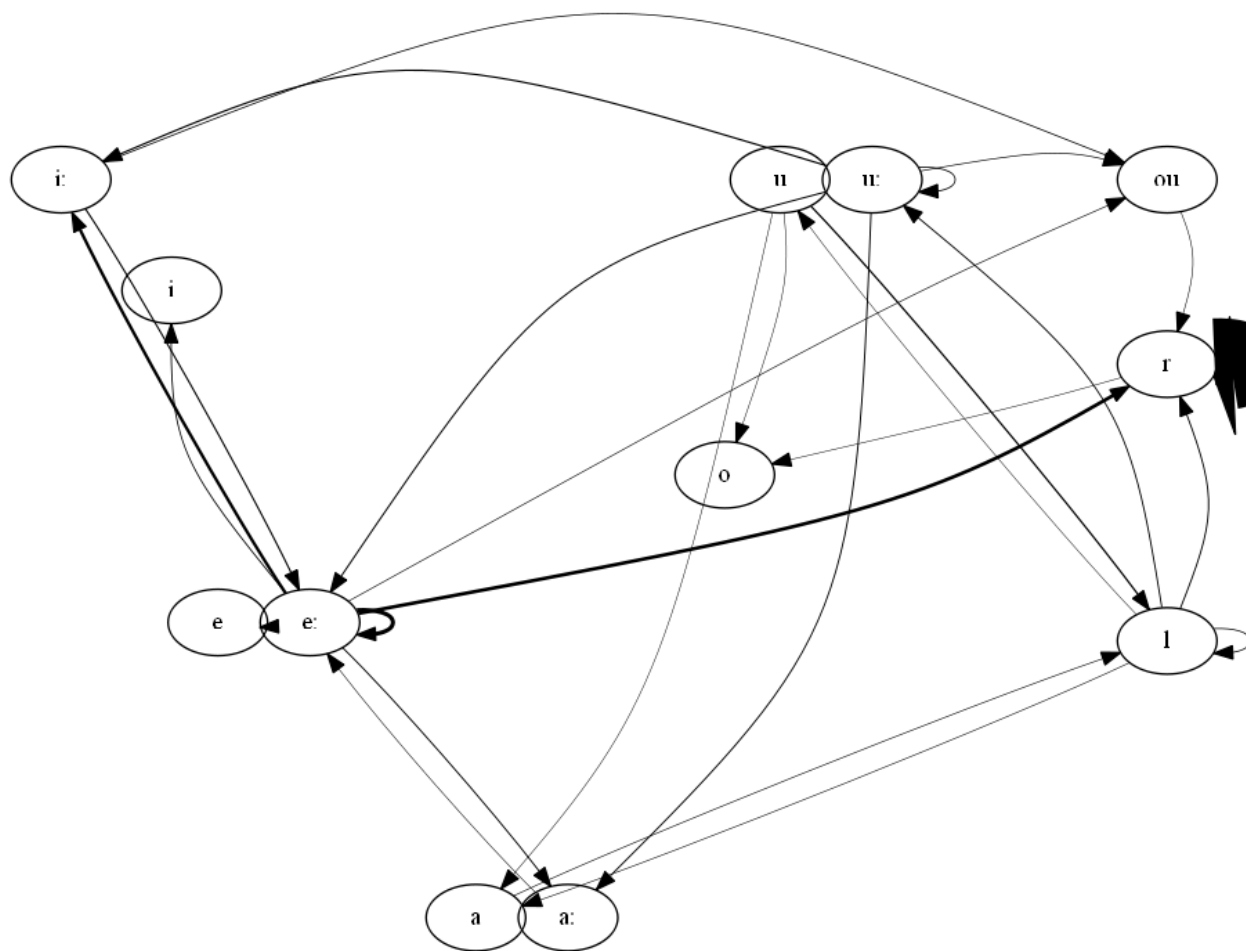
Czech – Underrepresented (R<0.2)



Czech – Underrepresented (R<0.4)



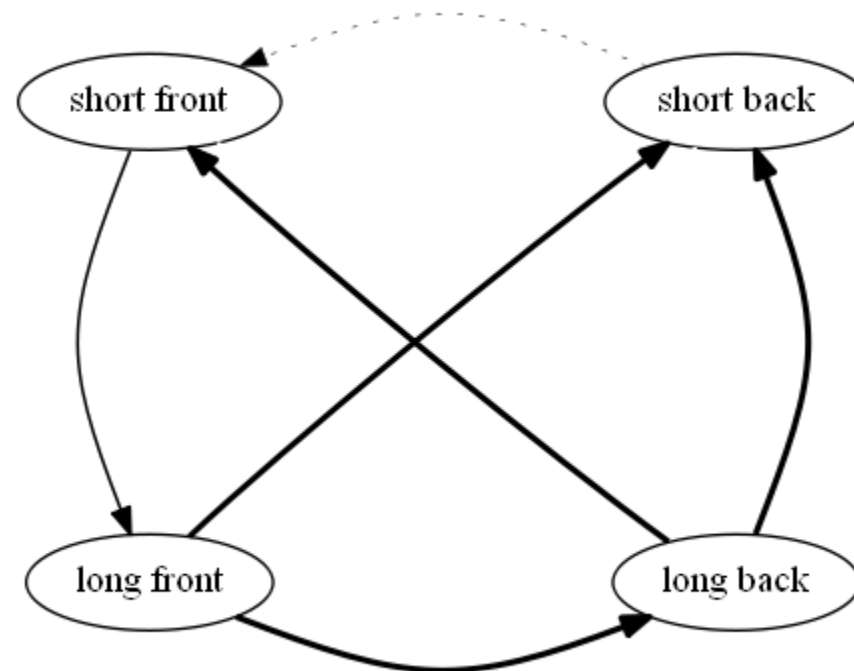
Czech – Underrepresented (R<0.6)



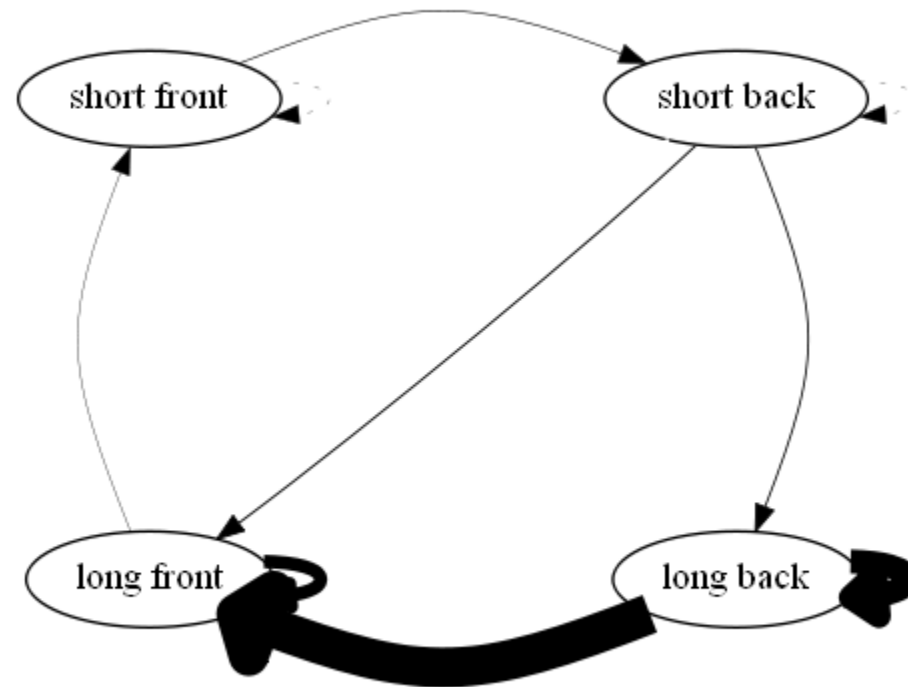
Czech Vowel Phonotactics (no /a/, /á/)

		Front		Back	
		Short	Long	Short	Long
Front	Short	0.95	1.22	0.92	1.00
	Long	0.95	0.50	1.45	1.58
Back	Short	1.07	0.88	0.98	0.89
	Long	1.21	0.25	1.25	0.35

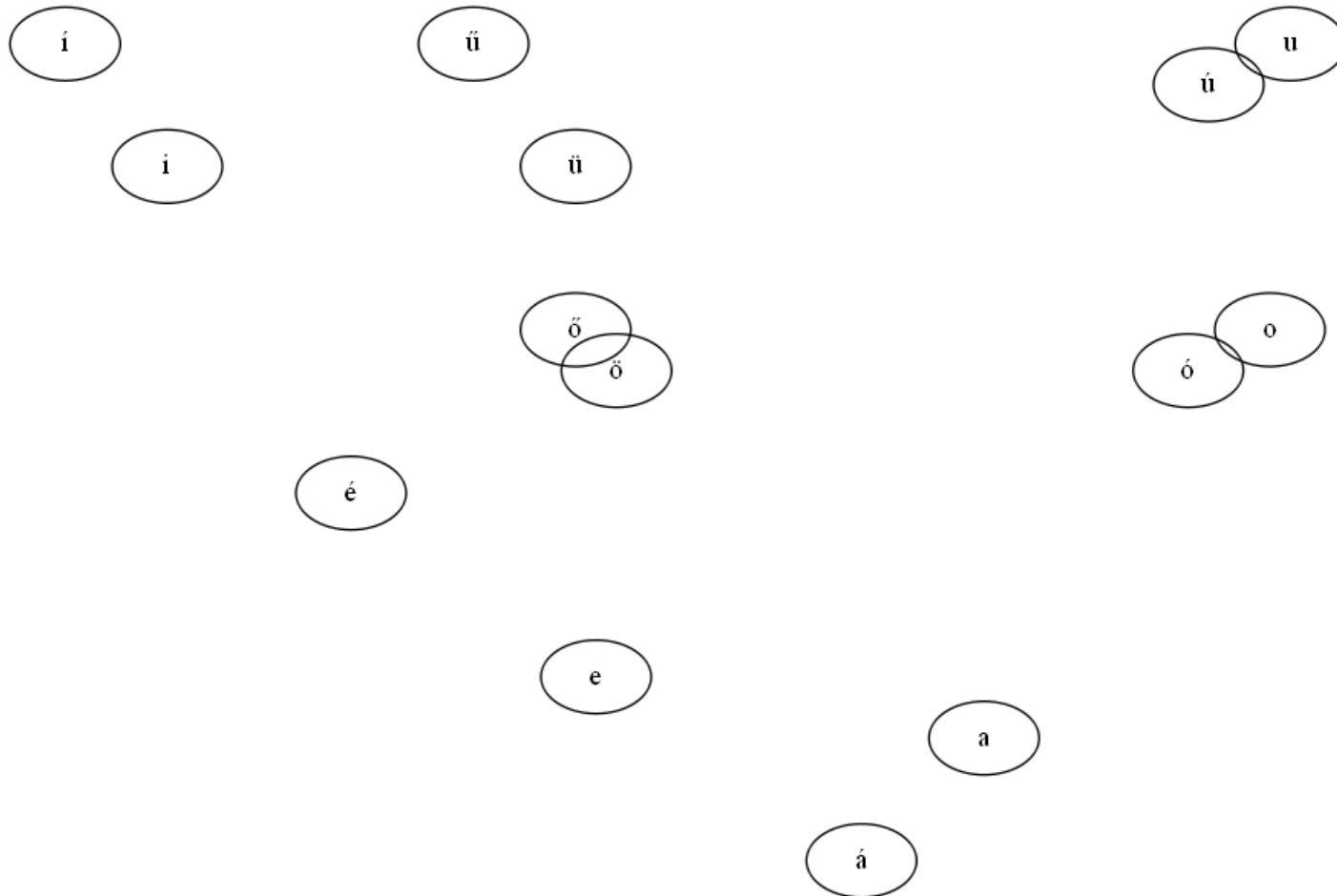
Czech Vowel Phonotactics (Positive)



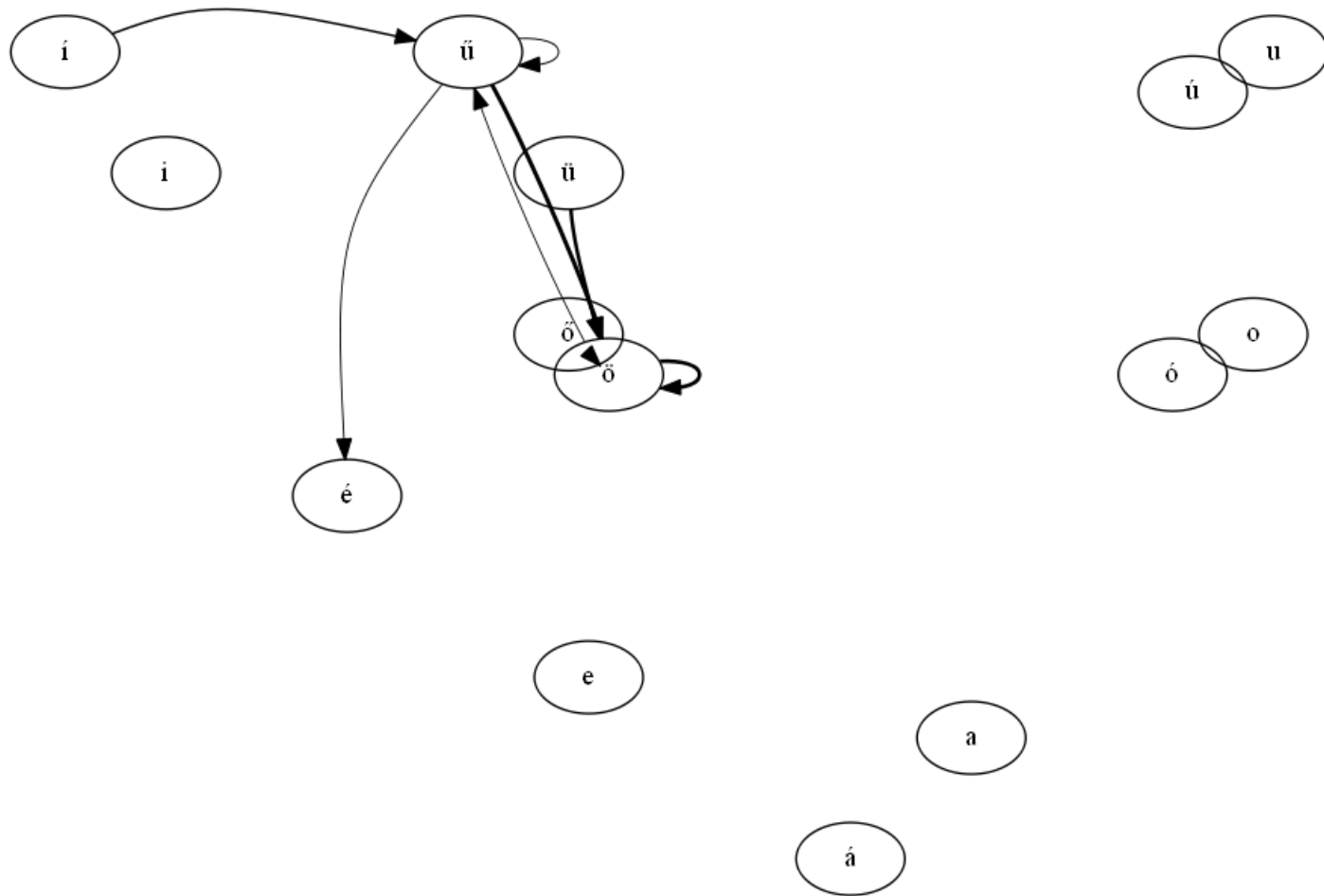
Czech Vowel Phonotactics (Negative)



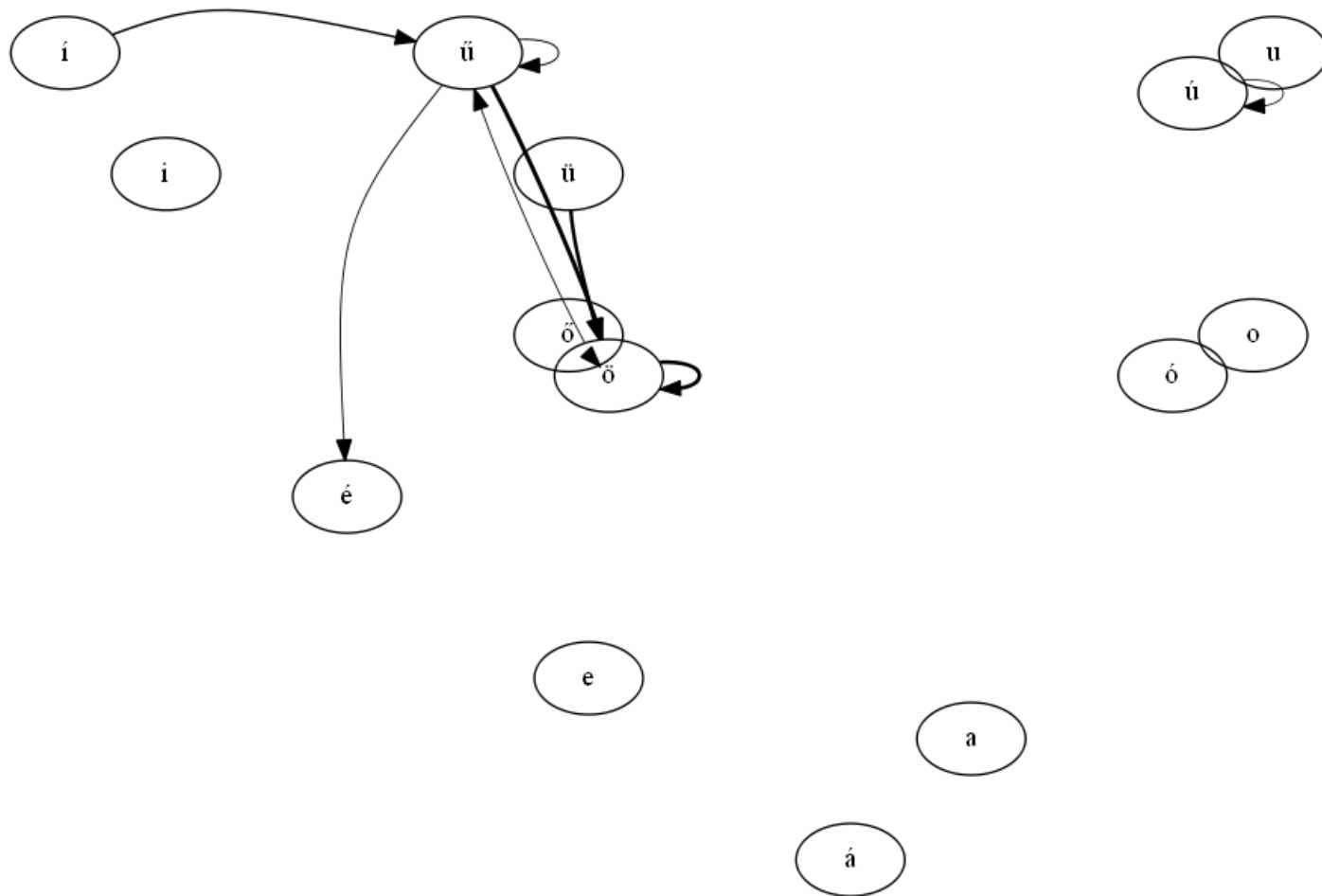
Results: Hungarian



Hungarian – Overrepresented ($R > 3$)



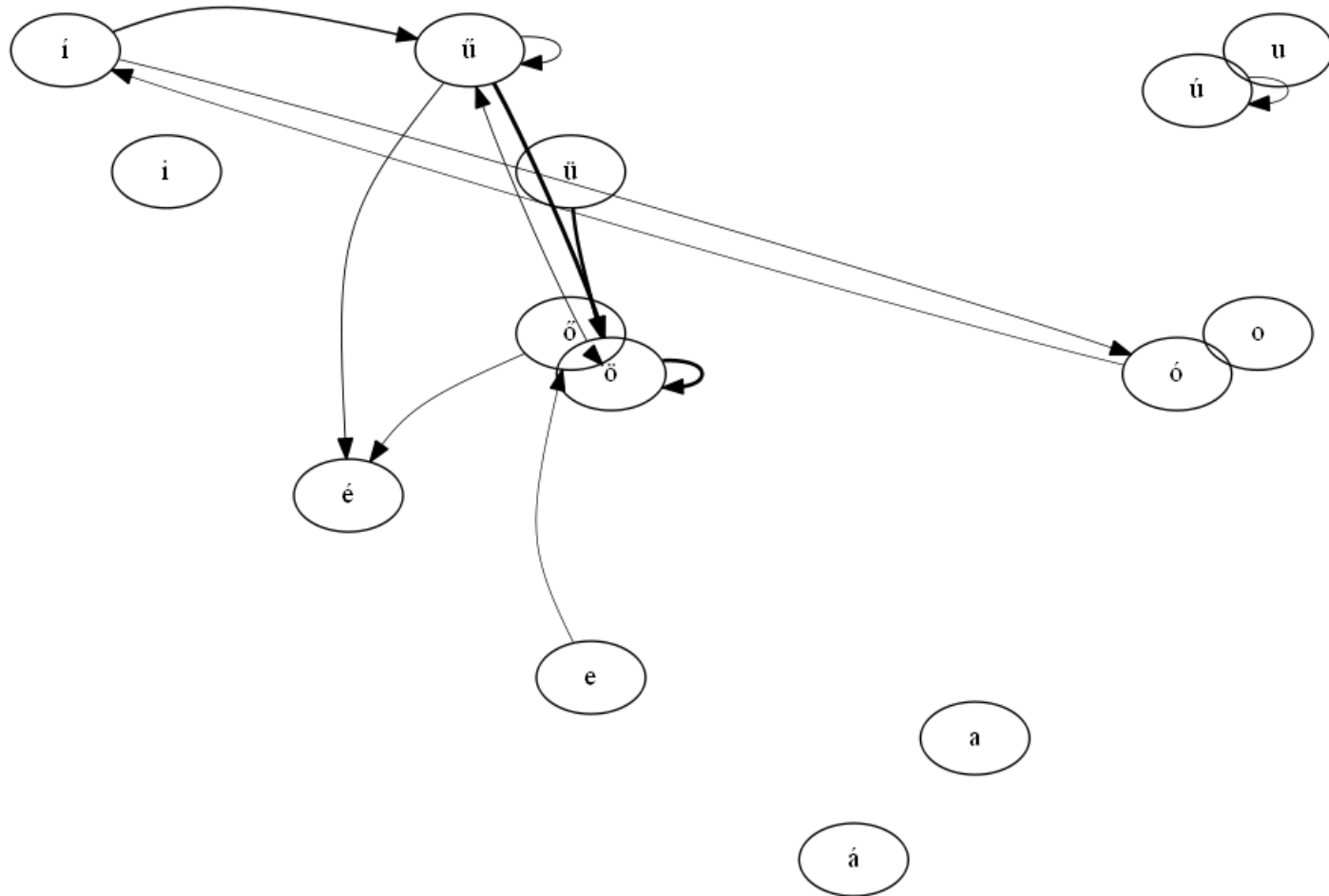
Hungarian – Overrepresented ($R > 2.7$)



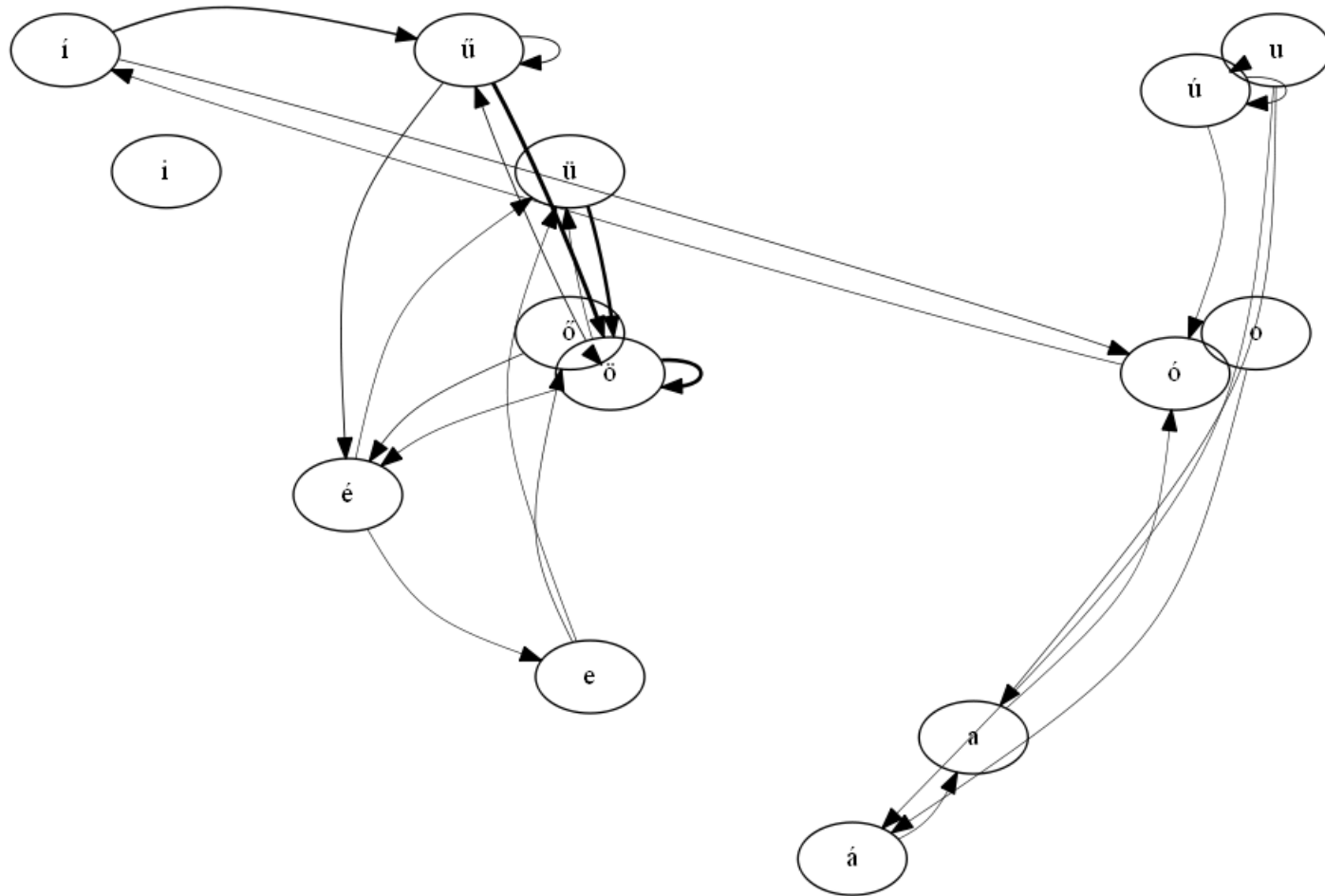
Hungarian – Overrepresented ($R > 2.6$)



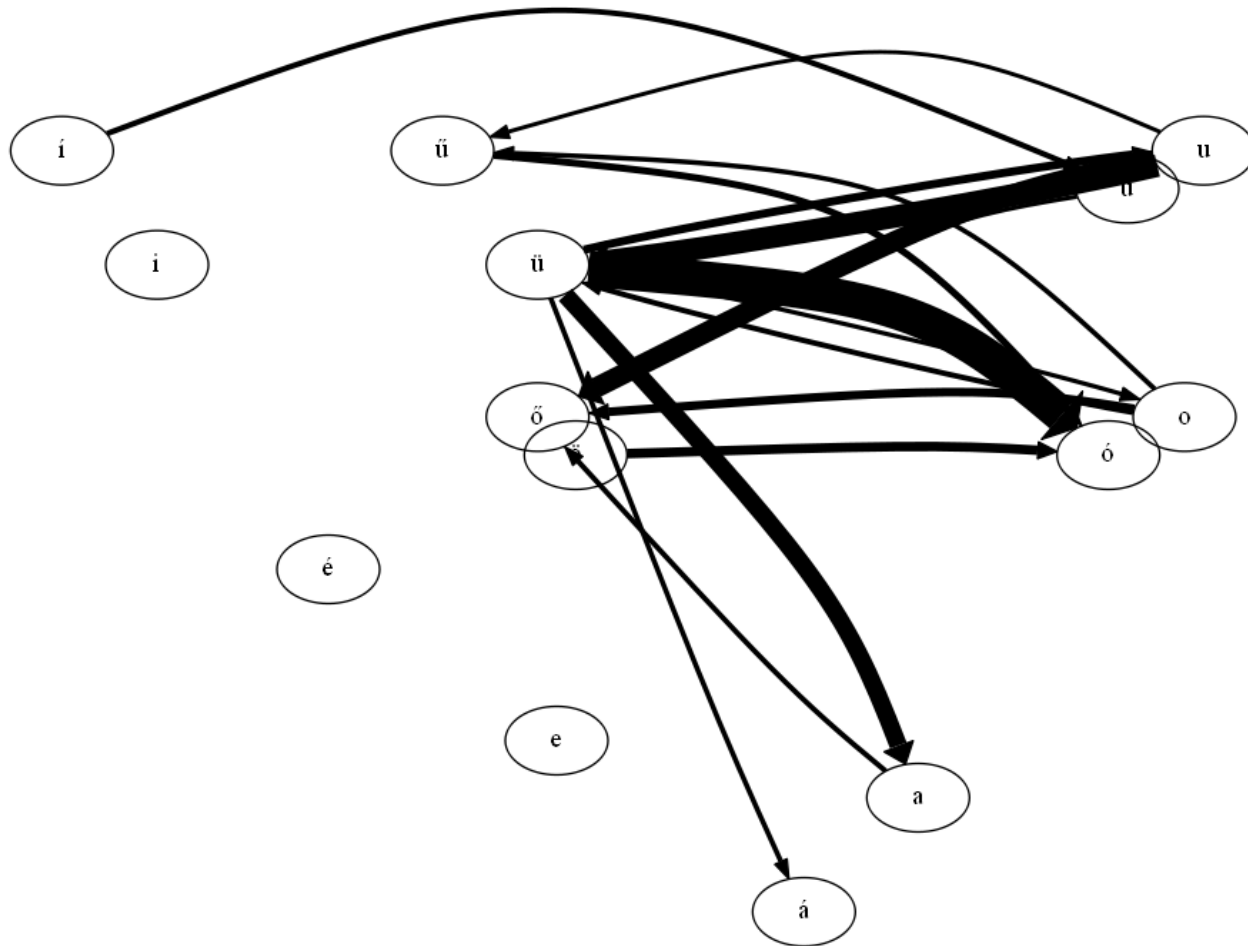
Hungarian – Overrepresented ($R > 2.3$)



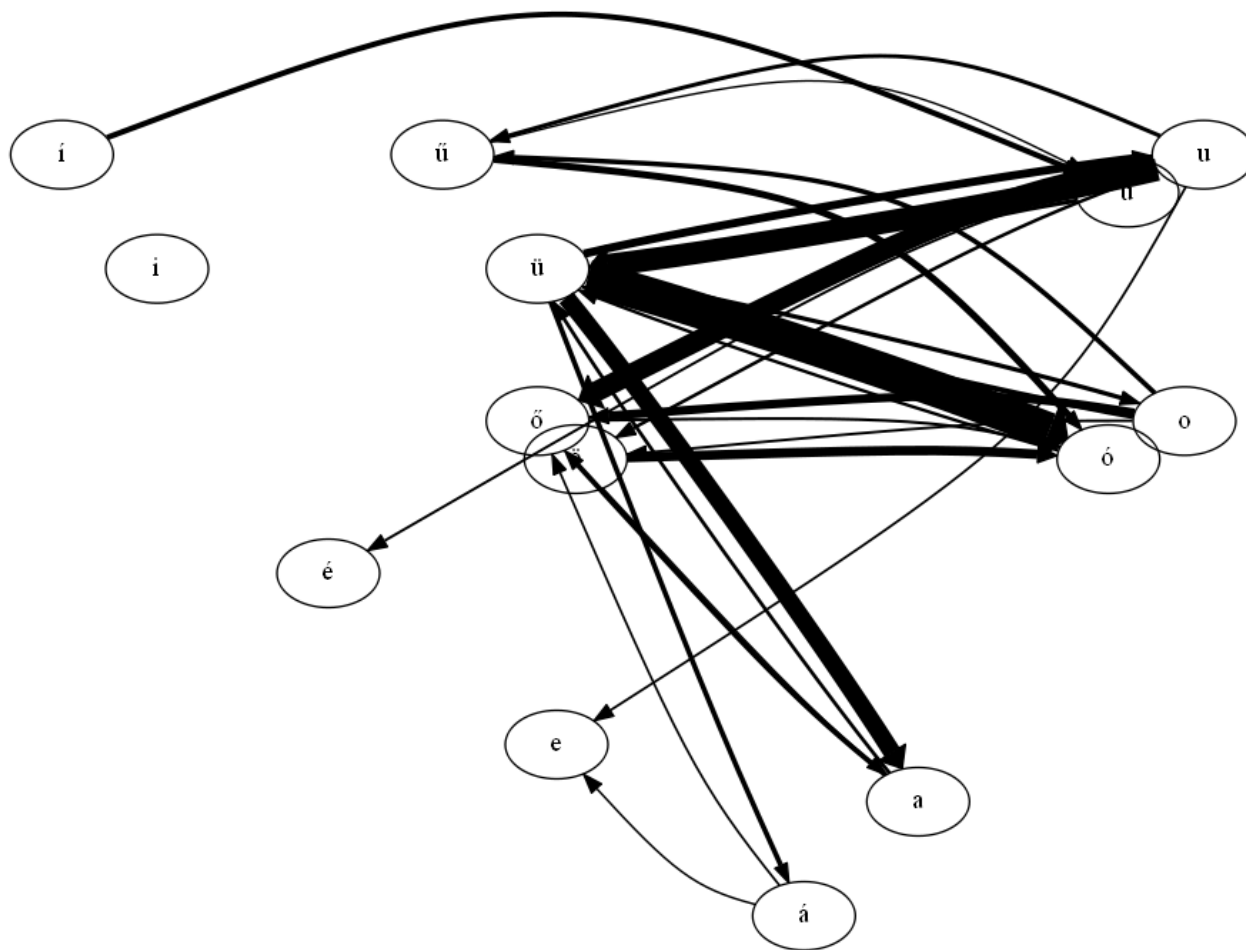
Hungarian – Overrepresented ($R > 2$)



Hungarian – Underrepresented ($R < 0.05$)





Hungarian – Underrepresented ($R < 0.1$)



Hungarian

		Front		Back	
		Short	Long	Short	Long
Front	Short	1.84	1.89	0.21	0.20
	Long	1.91	1.66	0.22	0.25
Back	Short	0.15	0.17	1.72	1.91
	Long	0.13	0.22	1.92	1.47

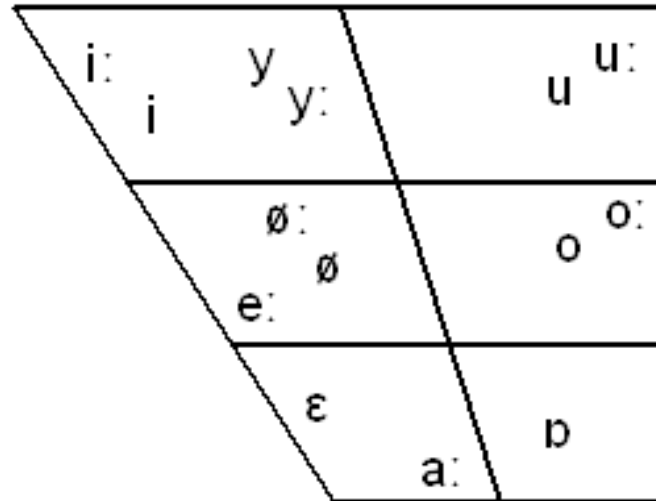
Hungarian

		Front		Back	
		Short	Long	Short	Long
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	Long	1.91	 1.66	0.22	0.25
Back	Short	0.15	0.17	1.72	1.91
	Long	0.13	0.22	1.92	 1.47

THE POSITION OF /A/ AND /Á/ IN THE PHONOTACTIC SYSTEM

Hungarian Phonotactics

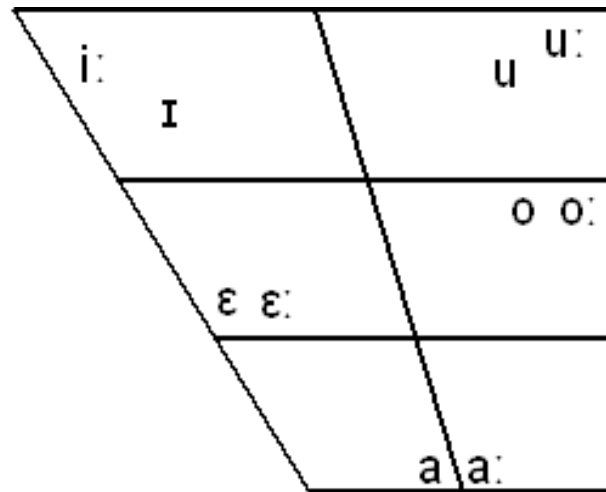
- /a/ behaves as any other back vowel
- this agrees with the position in the vowel triangle



Hungarian vowel system

Czech Phonotactics

/a/ and */á/* are in the central position



Czech vowel system

Czech Phonotactics (no /a/, /á/)

		Front		Back	
		Short	Long	Short	Long
Front	Short	0.95	1.22	0.92	1.00
	Long	0.95	0.50	1.45	1.58
Back	Short	1.07	0.88	0.98	0.89
	Long	1.21	0.25	1.25	0.35

Czech Phonotactics

(/a/, /á/ as a back vowel)

		Front		Back	
		Short	Long	Short	Long
Front	Short	0.95	1.20	0.96	1.00
	Long	0.88	0.46	1.39	1.12
Back	Short	1.05	0.93	0.97	1.02
	Long	1.04	0.96	1.01	0.80

Czech Phonotactics

(/a/, /á/ as a front vowel)

		Front		Back	
		Short	Long	Short	Long
Front	Short	0.97	1.10	0.96	0.98
	Long	1.02	0.81	1.13	1.42
Back	Short	1.03	0.93	1.00	0.87
	Long	1.21	0.25	1.33	0.36

Czech Phonotactics

- /a/ and /á/ behave like a front vowels

Slovak Phonotactics

Make a prediction please

Slovak Phonotactics (no /a/, /á/)

		Front		Back	
		Short	Long	Short	Long
Front	Short	0.99	1.10	0.98	0.79
	Long	0.96	0.01	1.53	0.00
Back	Short	0.99	1.11	0.94	1.41
	Long	1.49	0.01	0.87	0.00

Slovak Phonotactics

(/a/, /á/ as a back vowel)

		Front		Back	
		Short	Long	Short	Long
Front	Short	0.95	1.14	0.99	1.13
	Long	0.86	0.01	1.51	0.04
Back	Short	1.02	1.16	0.92	1.16
	Long	1.17	0.02	1.26	0.01

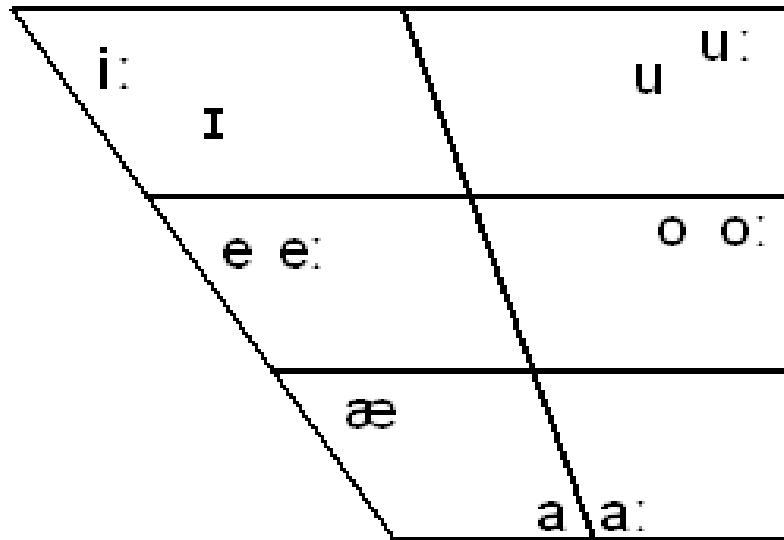
Slovak Phonotactics

(/a/, /á/ as a front vowel)

		Front		Back	
		Short	Long	Short	Long
Front	Short	0.97	1.14	0.97	1.08
	Long	1.21	0.02	1.25	0.00
Back	Short	0.95	1.17	0.97	1.26
	Long	1.43	0.00	0.81	0.00

Slovak Phonotactics

- /a/ and /á/ also behave like a front vowels



Slovak vowel system

Conclusions

- The tendency to the long → short → long... rhythm is present in Slovak, Czech and Hungarian.
- This tendency is strongest in the Slovak phonotactics.
- It is even stronger than the Hungarian vowel harmony.

The main difference between Slovak, Hungarian and Czech

- **Slovak:** strong quantitative constraint independent from weak qualitative constraints.
- **Hungarian:** strong qualitative constraints independent from weak quantitative constraints.
- **Czech:** weak quantitative and qualitative constraints. They are not independent.

Thank you!

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