Backing vacillating stems
Hungarian vowel harmony in fast speech

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Variation in Hungarian Vowel Harmony

Hungarian [±back] vowel harmony:

asztal	[ɒstɒl]	'table'	+ Dative *–nAk* =	*asztalnak*.
függöny	[fygːøɲ]	'curtain'	+ Dative *–nAk* =	*függönynek*.
fotel	[fotɛl]	'armchair'	+ Dative *–nAk* =	*fotelnak*∼*fotelnek*.

- Both considered grammatical by native speakers.
- Both amply attested in corpora.

Inter-speaker or intra-speaker variation? Both:

- Self-report, etc.
- Experiment below.

Variation in Hungarian Vowel Harmony

Most *vacillating* stems: back vowel followed by front vowel.
Phonological *et al.* factors determine if / to what degree a stem vacillates.

For **a specific stem**, variation (= probability of back suffix)
modulated by further factors:

- Dialect of the speaker (Blaho and Szeredi 2013).
- Suffix/case.
- Syntactic context (*ennek a X-nAk* 'to this X' vs. *annak a X-nAk* 'to that X').
- Priming by earlier decisions (Biró and Füredi on Saturday).
- Style (formal and causal), topic, etc.? — *to be researched.*

- Speech rate? — *goal of this study.*

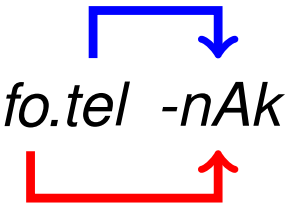
Overview

1. Speech rate influencing variation
2. Our experiments: Design
3. Our experiments: Results
4. Discussion

Overview

Speech rate influencing variation (1)

Vacillation (probably) due to conflicting constraints:



/fotel+nAk/	LocalHarmony[F]	DistantHarmony[B]
[fotel.nak]	*	
[fotel.nek]		*

1. Only local harmony is phonetically motivated,

→ local F-harmony stronger in fast speech,

→ prediction: *fotelnek* more frequent in fast than in normal speech.

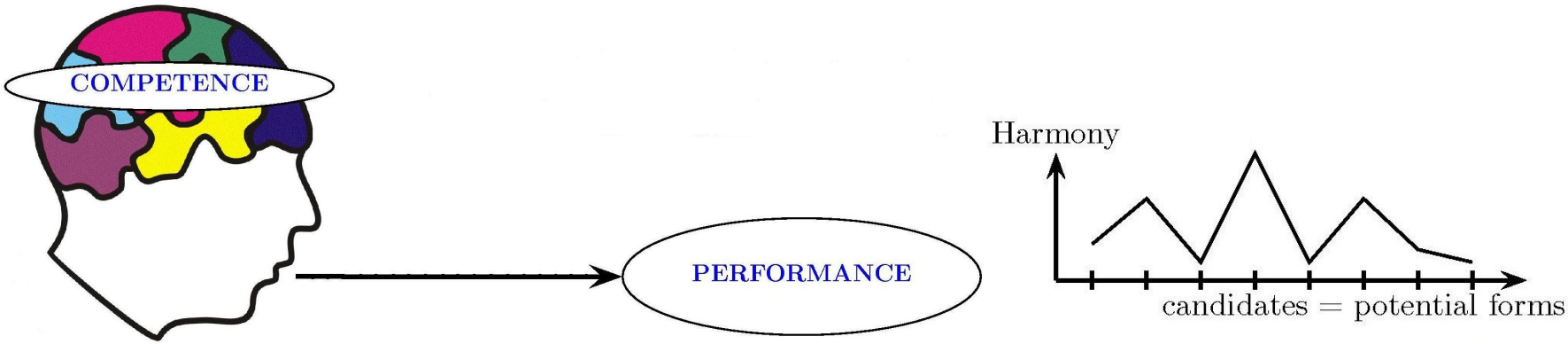
2. Distant B-harmony 'less distant' in fast speech (as measured in msec),

→ distant harmony stronger in fast speech,

→ prediction: *fotelnak* more frequent in fast than in normal speech.

Speech rate influencing variation (2)

Smolensky and Legendre (2006); Biró (2006):



mental grammar
modelled by (e.g.) OT
introduces
☞ globally optimal forms

mental computation
modelled by (e.g.) simulated annealing
(imperfect search for ☞) produces
∼ locally optimal forms

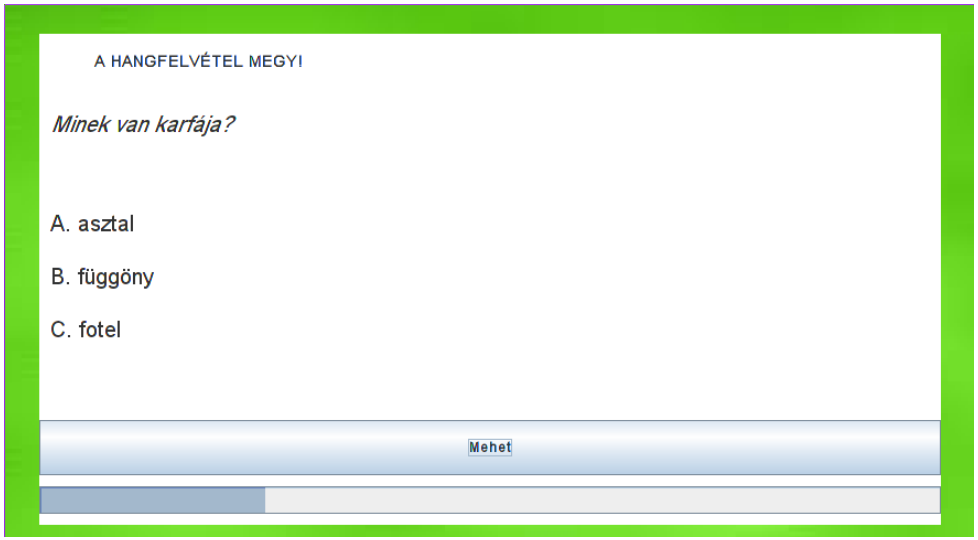
As computation speeds up, frequency of ☞ global optimum (usually) drops, and the frequency of other local optima increases. Hence, if *fotelnek* less frequent in fast speech than in normal speech, then argument for ☞ *fotelnek*.

Overview

Eliciting fast speech data in a quiz-like situation

Based on idea of *Maartje Schreuder* and *Dicky Gilbers* (S.&M. 2004, S. 2006).

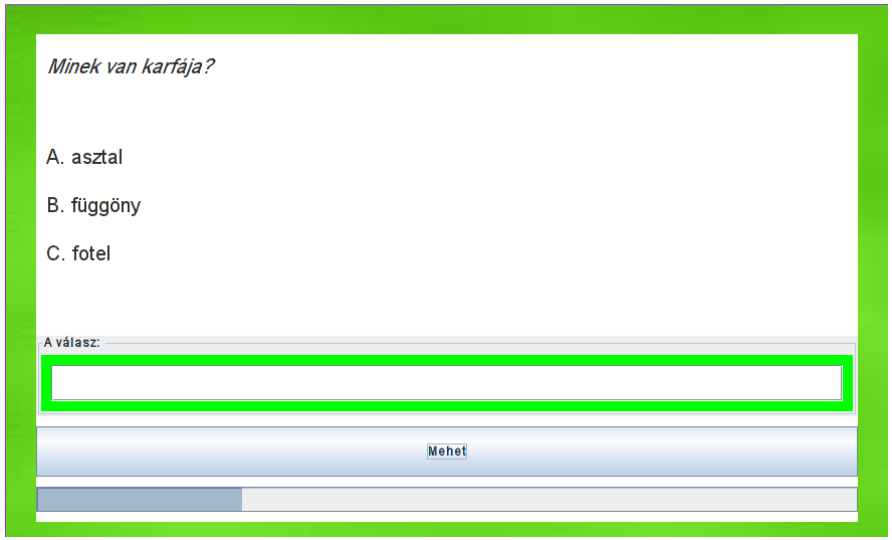
Part 1: Say to the microphone



Q: *What has armrests?*
(lit.: 'To what are armrests?')
A. Table. B. Curtain. C. Armchair.

- Q presented visually and auditorily.
- Answers presented only visually.

Part 2: Type in the field



Response using dative or inessive case ('to armchair'), to be figured out by subject.
Presentation orders of items and answers:

- randomized across subjects,
- same in two modalities for given subject.

Details

- Software written by author in Java (TB).
- Experiment 1: 26 Hungarian native speaker subjects (11 male, 15 female, age: 20–57, median: 25). 10 target words.
- Experiment 2: still being evaluated (# of subjects and # of target words doubled).
- Target words: vacillating stem, with one back stem and one front stem as alternative answers (comparable semantic field, phonological and morphological complexity, frequency).
- Fillers: equal # as targets, of which half back and half front. Answers required various cases (including dative and inessive).
- Experiment starts with three fillers. Then back and front fillers alternate. E.g., `B F B T F T T B T F T B T T F T B T F T`.
- Evaluation: done by software for written part; done by authors for oral part (inter-rater agreement $>$ 98%, Cohen's kappa index $=$ 97%).

Overview

Experiment 1: non-real vacillating stems

Words that could vacillate in theory, but do not, or do 'differently':

			Corpus (*)		fast		normal	
	allomorph chosen:		B	F	B	F	B	F
hamburger	'hamburger'	.INESS	1	11	1	24	0	25
sláger	'hit'	.DAT	1	127	0	21	1	24
dzsungel	'jungle'	.INESS	30	569	0	25	1	25
férfi	'[male] man'	.DAT	3908	928	12	2	16	7
Athén	'Athens'	.INESS	2717	359	22	4	23	2
balhé	'roughhouse'	.INESS	24	0	24	0	26	0

(*) Hungarian National Corpus (`http://mnsz.nytud.hu`).

Experiment 1: real vacillating stems

For really vacillating stems, when moving from fast/oral modality to normal/written modality, frequency of F suffix increased!

			Corpus (*)		fast		normal	
	allomorph chosen:		B	F	B	F	B	F
hotel	'hotel'	.INESS	236	1419	6	19	1	24
farmer	'jeans'	.DAT	4	4	7	17	5	17
farmer	'farmer'	.DAT	13	30	10	15	6	17
fotel	'armchair'	.DAT	12	3	6	19	4	21

(*) Hungarian National Corpus (`http://mnsz.nytud.hu`).

Experiment 1: real vacillating stems

Matched-pair design:

			Corpus (*)		*(fast, normal) pairs*			
	allomorph chosen:		B	F	BB	BF	FB	FF
hotel	'hotel'	.INESS	236	1419	1	5	0	18
farmer	'jeans'	.DAT	4	4	3	2	2	14
farmer	'farmer'	.DAT	13	30	6	4	0	12
fotel	'armchair'	.DAT	12	3	3	3	1	17

Probability of front suffix is increased in normal/written condition!
McNemar's Chi-squared test with continuity correction:
$\chi^2 = 5.8824$, df $= 1$, $p = 0.0153$.

(*) Hungarian National Corpus (`http://mnsz.nytud.hu`).

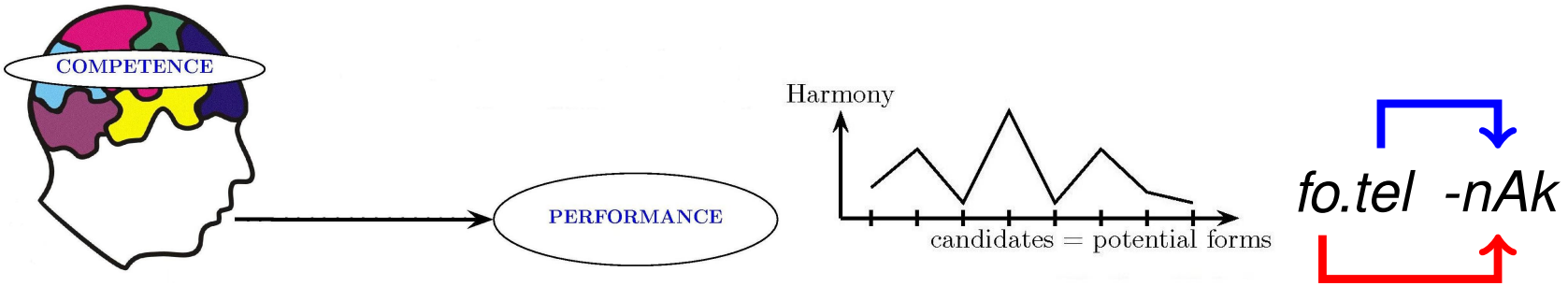
Experiment 2: preliminary results

- 61 Hungarian native speaker subjects.
- 20 target words: new ones, and old ones (old or new case).
- Tendency again: fast speech more frequently [+back].
- Some speakers unnaturally stressing suffix: reversed effect. Hyper-correctness in part 1?
- One group of speakers with strong preference for F suffix and much less cross-modality differences.
- Those with a preference for B suffix in normal/written modality, will typically yield more cross-modality variances.

Overview

Speech rate does influence variation!

Frequency of B suffix increased in fast speech



/fotel+nAk/	LocalHarmony[F]	DistantHarmony[B]
∼ [fotel.nak]	*	
☞ [fotel.nek]		*

- LocalHarmony[F] $\underset{\sim}{\gg}$ DistantHarmony[B] → ☞ F-suffix.
- ∼ B-suffix produced, and produced more often in fast speech:

1. by imperfect mental computation (prone to errors), as local optimum?
2. DistantHarmony[B] 'less distant' in fast speech, slightly promoted?
3. noise (stoch. OT), stronger in fast speech ('increased randomness', reviewer 5)?

Thank you for your attention!

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