

ALIENS vs. ALLIES:

The Heterogeneity of Disharmony in Turkish

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Turkish Vowel System

The Phonological Expressions (PEs) corresponding to Turkish Vowels are selected by the following Licensing Constraints (Charette & Göksel, 1996):

1. Operators must be licensed.
2. A cannot license operators.
3. U must be head.

Representation of Turkish Vowels:

(<u>A</u>)	a	(<u>A</u>)	e
(<u> </u>)	ı	(<u> </u>)	i
(<u>A</u> <u>U</u>)	o	(<u>A</u> <u>U</u>)	ö
(<u> </u> <u>U</u>)	u	(<u> </u> <u>U</u>)	ü

Principles underlying Turkish Vowel Harmony (TVH)

1. An I element associated with N_x must spread onto N_{x+1} .
2. An U element associated with N_x must spread onto N_{x+1} on the condition that N_{x+1} lacks the A element.
3. An A element never spreads.

Central assumption: Underlyingly, a non-initial nucleus can either contain the A element, or be entirely empty – i.e. If you find I or U in a non-initial position, it must have spread from the preceding vowel.

- Problem: While TVH regularly applies in suffixes - except for a few non-alternating ones -, there are a lot of disharmonic (DH) roots, most of which are loanwords.

Government Phonology (GP)

Two principles underlying phonological operations (Kaye, 1992):

- Minimality Hypothesis: Processes apply whenever their conditions are met. → No exceptions!
- Non-Arbitrariness Principle: There must be a relation between a phonological process and the environment it occurs in.

- While TVH is a non-arbitrary process, which can easily be expressed through Licensing Constraints and spreading of elements, there exist lots of DH words in the Turkish lexicon.
- Government Phonology (GP) can deal
 - neither with the asymmetry between suffixes and roots: a phonological process cannot apply only across boundaries, without applying within a single analytic domain.
 - nor with the asymmetry between native and borrowed words.

A closer investigation of Turkish-DH

An experimental survey

Task A

- Subjects were given a written list of 110 bisyllabic DH-words (34 Turkish words and 76 nonce-words) in random order.
- The nonce-words in the data contained voiceless consonants only (p, t, k, tʃ, f, s, ʃ).
- The participants were asked to pronounce each word once, and then give a score in a scale of 1 to 5 with respect to “how Turkish” each one sounds.
- Participants: 24 Turkish native speakers (6 males & 18 females, age-range: 18-60, average-age: 23.9).

Task A: Findings (1)

- As expected, Turkish words, in general, received a higher rating than nonce-words.
 - Most favored Turkish words: **kamu** (4.71), **kare** (4.67)
 - Most favored nonce-words: **kaçe** (3.58), **teka** (3.5)
 - Least favored Turkish words: **cingıl** (2.25), **nötron** (3.21)
 - Least favored nonce-words: **çışpüt** (1.58), **çespıt** (1.58), **kiffıç** (1.58)

- No significant rating-difference between the various types of DH:
 - (i) Failure of I to spread: e.g. ‘**kiça**’ instead of ‘**kiçe**’
 - (ii) Failure of U to spread e.g. ‘**poçı**’ instead of **poçu**’
 - (iii) I in N_{x+1} , while no I in N_x e.g. ‘**tıpe**’ instead of ‘**tipe**’
 - (iv) U in N_{x+1} , while no U in N_x e.g. ‘**kaspuç**’ instead of ‘**kospuç**’

Task A: Findings (2)

Acceptability of DH Turkish Words

Overall acceptability rate: 4.01/5

	N ₁	N ₂	Overall	STDEV
a	4.23	4.29	4.25	0.37
e	4.19	4.49	4.34	0.25
ı*	4.38	2.25	3.07	1.23
i	3.72	3.93	3.85	0.63
o	4.02	4.11	4.04	0.43
ö	3.38*	3.58	3.52	0.3
u	4.01	4.17	4.09	0.52
ü	3.93	4.07	4	0.34

Acceptability of DH Nonce-Words

Overall acceptability rate: 2.39 / 5

	N ₁	N ₂	Overall	STDEV
a	2.73	2.67	2.7	0.55
e	2.69	2.84	2.76	0.54
ı	2.05	2.09	2.07	0.37
i	2.35	2.43	2.39	0.44
o	2.5	2.45	2.46	0.4
ö	2.19	2.06	2.13	0.33
u	2.45	2.35	2.4	0.4
ü	2.15	2.21	2.18	0.37

*There exist very few DH words in Turkish containing **ı** (in any position), and also containing **o** in initial position.

Task A: Findings (3)

Asymmetry: DH sequences containing **a** or **e** sound more acceptable / “Turkish-like”, DH sequences containing **ɪ** and **ö** sound disturbing/*alien*.

➤ due to *markedness*?

No! If **a**, **i**, and **u** are the least marked and **ɪ**, **ü** and **ö** are the most marked vowels, we would expect (i) DH sequences containing **ü** to be as unacceptable as those containing **ɪ** and **ö**, and (ii) DH sequences containing **ɪ** and **u** to be as acceptable as those containing **a** and also more acceptable than those containing **e**.

➤ due to *complexity*?

No (Not entirely)! It may have an effect on the unacceptability: **ɪ** is the least complex and **ö** is the most complex vowel. BUT DH sequences containing **i** or **u**, both of which are built up of a single element, are judged to be significantly less acceptable than sequences containing **e**, which is a combination of A and I.

Task B

- Subjects were given a one-page-long story containing a total number of 56 nonce-words, all of which (i) are DH, (ii) have a tri-syllabic base (plus suffixes), (iii) contained only voiceless obstruents as consonants, (iv) are expected to be interpreted as nouns (due to syntactic positions and morphological markers), (v) do not occur in the immediately pre-verbal (focus) position.
- The participants were asked to read the story once for themselves, and then to read it out loud. This second reading was recorded.
- Participants: 26 native speakers of Turkish (7 males & 19 females, age-range: 18-60, average-age: 23.3)

Task B: Findings (1)

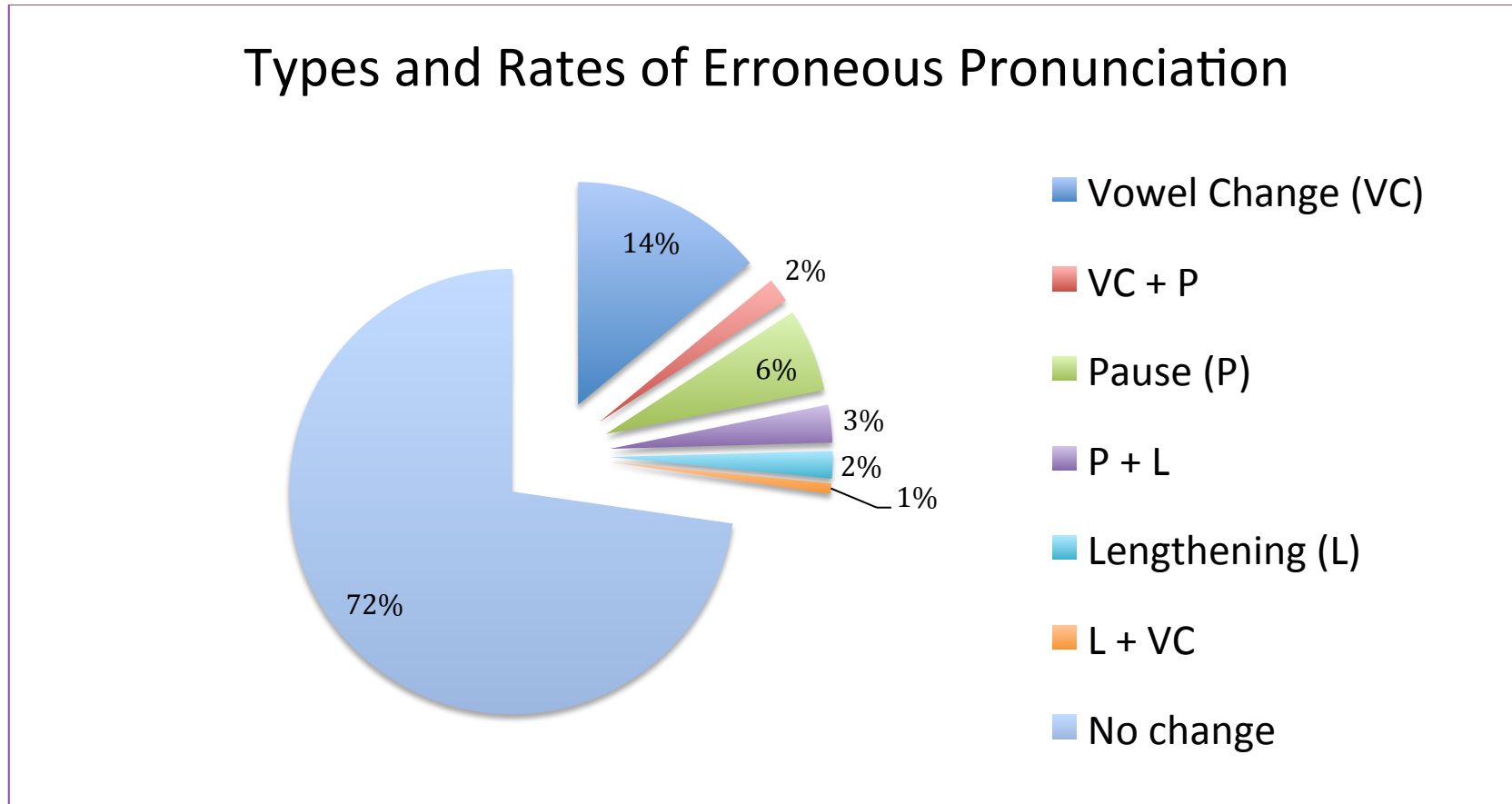
- 72% of the time, the participants were able to pronounce the DH nonce-word correctly.
- For the 28% of the cases, the DH nonce-words were pronounced erroneously. The types of errors were varied:

Examples: Vowel Change e.g. **patoke** → **patöke**
 Vowel Lengthening e.g. **çiköpu** → **çikö:pu**
 Pausing e.g. **pökütü** → **pökı-tü**

Depending on the number of participants who pronounced a particular word incorrectly:

- Most easily pronounceable words:
 pektıka (0), **kütüspı** (0), **taketa** (1), **tıpaku** (1), **kistupa** (1)
- Words most difficult to pronounce:
 pökütü (22), **çiköpö** (20), **pötikü** (18), **pekötu** (18)

Task B: Findings (2)



- No pattern with respect to the trigger, target or the nature of the error/change. The type of errors seem to be randomly distributed.

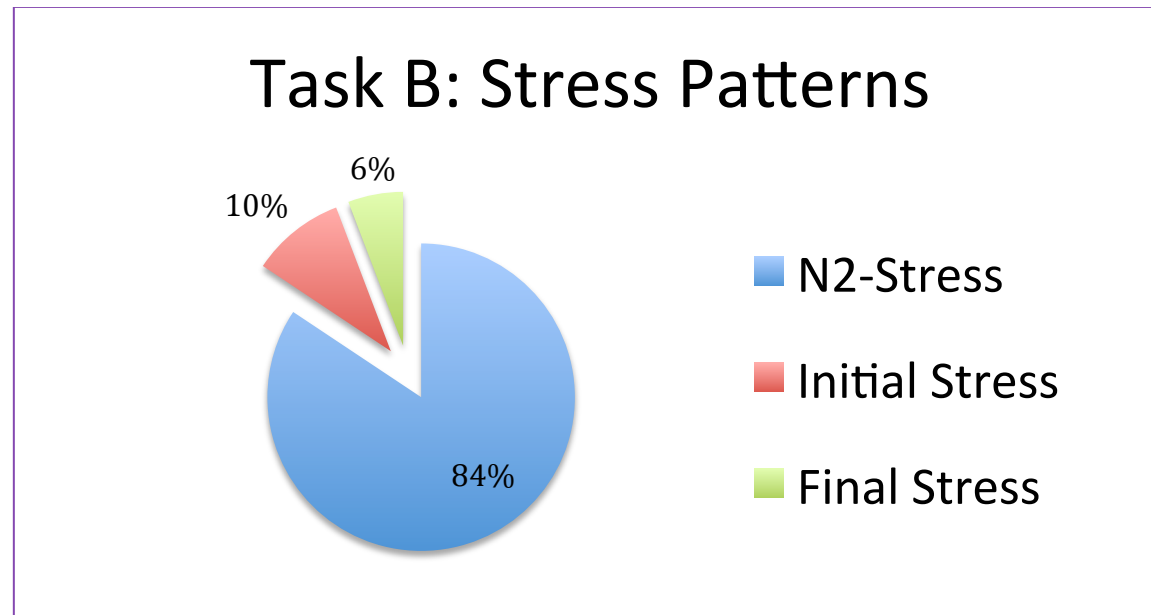
Task B: Findings (3)

Instances of Vowel Change also seem to be random with respect to the nature, direction, trigger, and target of change:

- (i) element-insertion
e.g. A-insertion at N₁: pükütta → pökütta
- (ii) element-deletion
e.g. I-deletion at N₁: pötikü → potikü
- (iii) rightwards spreading
e.g. U-spreading from N₂ to N₃: kaçöti → kaçötü
- (iv) leftwards spreading
e.g. I-spreading from N₃ to N₂: patoke → patöke
- (v) or a combination of those above
e.g. U-deletion at N₁ + I-spreading from N₁ to N₂
pöstoka → pestöka

Task B: Findings (4)

- Similar to Task A-findings, DH-sequences with **ı** and **ö** were more subject to error and those with **a** and **e** were easier to pronounce.
- The most interesting finding: Turkish is traditionally assumed to have final stress, yet most of the participants assigned stress to the second syllable of most of the DH nonce-words – as if they were trying to mark it as something even more alien-sounding.



Discussion

- Spreading of I and U is not sufficient to explain TVH.
 - Proposal: Lexically stressed & long vowels are harmony-resistant.
 - Support: Among the most frequently used 600 poly-syllabic words in Turkish, 178 are DH. 73 of those have long vowels and 24 of them bear lexical non-final stress.
- The asymmetry between A on the one hand, and I and U on the other must be further investigated (cf. Pöchtrager, 2010b). This may shed light to the acceptability of a and e even in seemingly DH sequences. Moreover, it can also be the case that there exist more than eight vowels in Turkish, as is argued by Pöchtrager (2010a).
- Due to the unacceptability of ö (containing 3 elements) and ı (the empty vowel) in combination with most of the other vowels, it can be argued that complexity plays a role in TVH as well, in requiring successive vowels to be close to each other in terms of complexity.

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