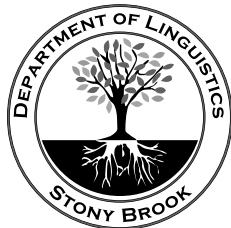


A Contrastive Hierarchy for Vowels in Southern Tati: Takestani Dialect NACIL 3

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Contributions

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- 1 Describe vowel alternations in Takestani verbal inflectional morphology.
- 2 Answer the questions: How are vowels represented in Takestani? Which features are contrastive?
 - ▶ Dresher (2009) argues that contrastive features are ordered hierarchically.
 - ▶ The vowel alternations determine the core system of vowel contrasts in Tati.

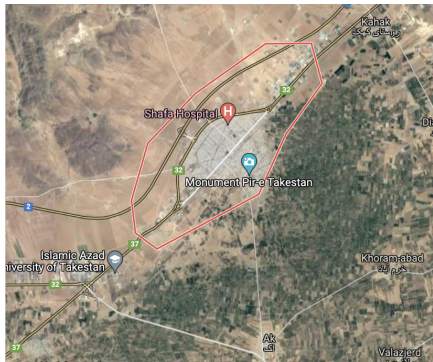
Southern Tati: Takestani

- ▶ Indo-European
- ▶ Indo-Iranian
- ▶ Categorized as “Definitely Endangered” by UNESCO: The number of children speaking it as their 1st language is dropping quickly.
- ▶ SOV word order
- ▶ No written form
- ▶ Rich verb morphology



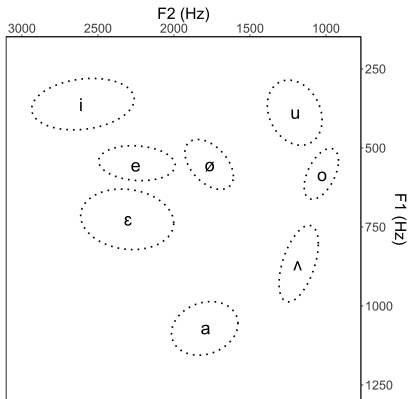
Takestan, Iran

- ▶ Population of nearly 100,000 people.
- ▶ Surrounded by Persian and Azari speakers.
- ▶ The city of Takestan is known as “Siyaden” by its residents.
- ▶ The Takestani dialect of Tati is known as “Siyadiniji” by local people.



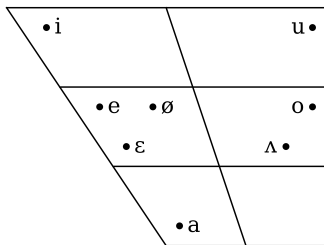
Vowel Phonemes in Takestani

Vowel	Word	Gloss
i	/pir/	<i>old</i>
e	/fer/	<i>son</i>
ɛ	/pej/	<i>back</i>
ø	/pør/	<i>full</i>
a	/par/	<i>feather</i>
u	/pur/	<i>powder</i>
o	/bor/	<i>bring.IMP</i>
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Vowel Notables

- ▶ Evidence for /e/ being Takestani's neutral vowel comes from epenthesis in loan words.
 - ▶ *plan* ~ [pe'la:n]
 - ▶ *stand* ~ [e'sta:nd]

Vowel Notables

- ▶ Evidence for /e/ being Takestani's neutral vowel comes from epenthesis in loan words.
 - ▶ *plan* ~ [pe^lla:n]
 - ▶ *stand* ~ [e^lsta:nd]

- ▶ Having phonemic /ø/ but no high-front rounded vowel is incredibly rare.
 - ▶ “/ø/ and /œ/ do not occur (separately or together) unless /y/ also occurs...” (Maddieson and Disner, 1984; pp. 13-14)
 - ▶ 55/2916 (1.9%) of the languages in PHOIBLE have a mid-front rounded vowel but no high-front rounded vowel (Moran and McCloy, 2019).

Verbal Morphology

PV	IPFV	NEG	STEM	CAUS	PSV	PST	AGR	
Λ-	me-	ne-	χΛr	-den	-i	-ast	-∅	<i>'It was not being drunk'</i>
be-			zand				-aviʃ	<i>'S/he had beaten'</i>

Imperfective Allomorphy

- ▶ The imperfective marker is pronounced as [me], [mi], [mø], [mu].

SR	Gloss	Translation
[me-χen-e]	IPF-read-3SM.IND. ITR	<i>'He reads'</i>
[me-zan-e]	IPF-hit-3SM.IND. TR	<i>'He hits'</i>
[me-sA:z-em]	IPF-endure-1S.IND. TR	<i>'I endure'</i>
[mi-vin-e]	IPF-see-3SM.IND. ITR	<i>'He sees'</i>
[mø-t ^h øn-ast ^h -em]	IPF-can-PST-1S.IND. TR	<i>'I could'</i>
[mu-guz-i]	IPF-flatulate-2S.IND. ITR	<i>'You flatulate'</i>

Negative Allomorphy

- ▶ The negative marker is pronounced as [ne], [ni], [nø], [no].

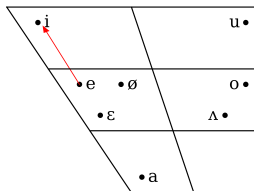
SR	Gloss	Translation
[me-ne-χen-e]	IPF-NEG-read-3SM.IND. ITR	<i>'He reads'</i>
[me-ne-ʃkas-om]	IPF-NEG-look-1P.IND. ITR	<i>'We do not look'</i>
[me-ne-χʌrd-em]	IPF-NEG-eat-1S.IND. TR	<i>'I was not eating'</i>
[mi-ni-nis-e]	IPF-NEG-write-3SM.IND. TR	<i>'He does not write'</i>
[mø-nø-zøn-i]	PV-NEG-know-2S.IND. TR	<i>'You do not know'</i>
[ʌ-no-χos-e]	PV-NEG-sleep-3SM.IND. ITR	<i>'He does not sleep'</i>

Alternations

- ▶ In both morphemes, the forms with [e] appear in the largest variety of contexts.
 - ▶ Hypothesis: underlying forms are /me/ and /ne/.
- ▶ Consequently:
 - /e/ → [i]/ ??? (raising)
 - /e/ → [ø]/ ??? (rounding)
 - /e/ → [o]/ ??? (backing)
 - /e/ → [u]/ ??? (backing + raising)

Raising: /e/ → [i] / _ C₀ i

- ▶ The raising process is regressive assimilation.
- ▶ Stems block the spreading process.



- ▶ Compare:

[mi-ni-nis-e] IPF-NEG-write-3SM.IND.TR *'he does not write'*

[me-ne-χen-i] IPF-NEG-read-2S.IND.TR *'you do not read'*

- ▶ More evidence comes from causative alternations:

[me-ne-χes-tin-i] IPF-NEG-soak-CAU-2S.IND.TR *'You do not soak'*

[me-ne-χes-ten-e] IPF-NEG-soak-CAU-3SM.IND.TR *'He does not soak'*

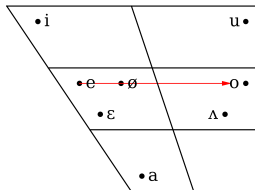
Backing: /e/ → [o] / _ C₀ o

- ▶ The backing process is regressive assimilation.
- ▶ Stems block the spreading process.
- ▶ Only a limited number of verbs have /o/ stems.
- ▶ Examples:

[Λ-no-χos-e] PV-NEG-sleep-3SM.IND.ITER *'he does not sleep'*

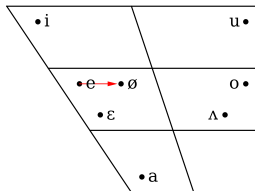
- ▶ Contrast:

[me-ker-om] IPF-plant-1P.IND.TR *'We plant'*



Rounding: /e/ → [ø] / {ø C₀ __, __ C₀ ø}

- ▶ The rounding process is bi-directional assimilation.
- ▶ Local spreading is blocked by non-/e/ vowels



▶ Examples:

[mø-nø-zøn-i]

IPF-NEG-know-2S.IND.ITR

'You do not know'

[mø-nø-zøn-ø]

IPF-NEG-know-3SM.IND.ITR

'He does not know'

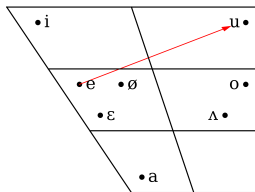
[mø-nø-t^høn-ast^h-em]

IPF-NEG-can-PST-1S.IND.ITR

'I was not able to'

Backing + Raising: /e/ → [u] / {uC₀_, _C₀u}

- ▶ The backing + raising process is bi-directional assimilation.
- ▶ Raising process blocks backing + raising.



- ▶ Examples:

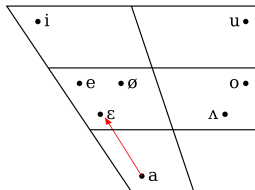
[u-nu-ʃʌr-e]	PV-NEG-open-3SM.IND.TR	<i>'He does not open'</i>
[Λ-nu-kun-e]	PV-NEG-pound-3SM.IND.TR	<i>'He does not pound'</i>
[mu-nu-guz-i]	IPF-NEG-flatulate-2S.IND.ITR	<i>'You do not flatulate'</i>

- ▶ Blocking:

[u-ni-tʃin-e]	PV-NEG-collect-3SM.IND.TR	<i>'He does not collect'</i>
[u-ni-lis-i]	PV-NEG-lick-2S.IND.TR	<i>'You do not lick'</i>

A second raising process: /a/ → [ɛ]

- ▶ /a/ in stems undergoes raising.
 - ▶ /a/ → [ɛ] / _C₀i

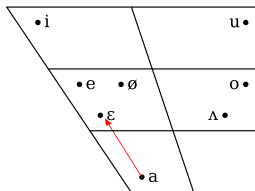


- ▶ Compare:

[u-nu-var-den-e]	PV-NEG-show-CAU-3SM.IND.TR	'He does not show'
[u-nu-vɛr-din-i]	PV-NEG-show-CAU-2S.IND.TR	'You do not show'

A second raising process: /a/ → [ɛ]

- ▶ Past tense morpheme also shows alternations.
- ▶ Update process to be long distance (blocked by /ʌ/, /o/)
 - ▶ /a/ → [ɛ] / _{C,V}0i



- ▶ Compare:

[ʌ-gɛr-den-ɛst-i]

PV-return-CAU-2S.IND.TR

'you returned'

[ʌ-gar-den-ast-em]

PV-return-CAU-1S.IND.TR

'you returned'

[b-andʌt-i]

PV-hang.PST-2S.IND.TR

'You hung'

[b-aʃon-i]

PV-hear-2S.SB.TR

'(You) to hear'

Summary of Vowel Alternations

- /e/ → [i] / $_ C_0 i$ (raising 1)
- /e/ → [o] / $_ C_0 o$ (backing)
- /e/ → [ø] / { $\emptyset C_0 _ , _ C_0 \emptyset$ } (rounding)
- /e/ → [u] / { $uC_0_ , _ C_0u$ } (backing + raising)
- /a/ → [ɛ] / $_ \{C,V\}_0 i$ (raising 2)

Contrastive Hierarchy (Dresher 2009)

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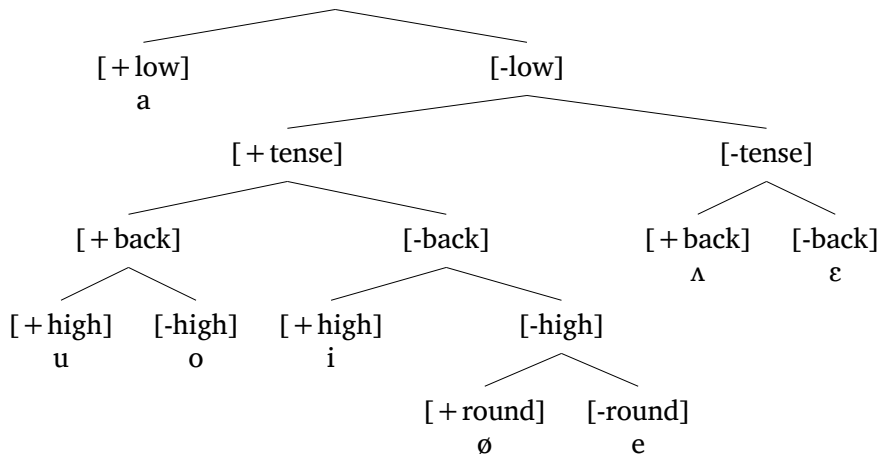
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Contrastive Hierarchy (Dresher 2009)

- ▶ What are the mental representations of vowels?
- ▶ Which features are contrastive and therefore minimally required to be present?
- ▶ Analyses using the Contrastive Hierarchy (Dresher 2009) tell us which features are redundant and which are not.
- ▶ It identifies core aspects of the mental representations.
- ▶ Any analysis using fully specified featural representations will have to revolve around the core system regardless.

A contrastive hierarchy for Takestani vowels

[low] > [tense] > [back] > [high] > [round]



Contrastive features for Takestani vowels

- ▶ [front] is not contrastive.
- ▶ [high] is only contrastive for [+tense] vowels.
- ▶ [round] is only contrastive for /e/ and /ø/.

Vowel	[front]	[back]	[high]	[low]	[tense]	[round]
/i/		-	+	-	+	
/u/		+	+	-	+	
/e/		-	-	-	+	-
/ɛ/		-		-	-	
/ø/		-	-	-	+	+
/o/		+	-	-	+	
/a/				+		
/ʌ/		+		-	-	

Feature ordering rationale

- ▶ n features $\rightarrow n!$ possible orderings.
- ▶ 5 features $\rightarrow 120$ possible orderings.
- ▶ Only [+tense] vowels target /e/, and /e/ changes only to [+tense] vowels.
- ▶ Should the top-most division based be based on [tense]?

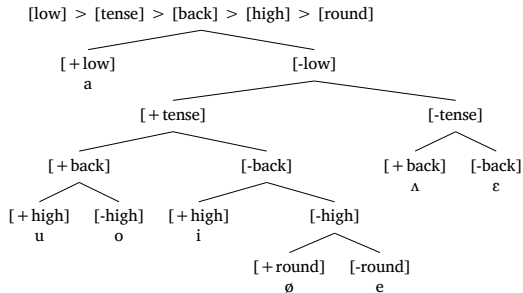
Must-have features

- ▶ Triggers of assimilation processes must be specified for the feature assimilating and for features necessary for triggering to take place (Dresher, 2009)

Vowel	[front]	[back]	[high]	[low]	[tense]	[round]
/i/		-	+✓	-✓	+✓	
/u/		+✓	+✓	-	+✓	
/e/		-	-	-	+	-
/ɛ/		-		-	-	
/ø/		-	-	-	+✓	+✓
/o/		+✓	-	-	+✓	
/a/				+		
/ʌ/		+		-	-	

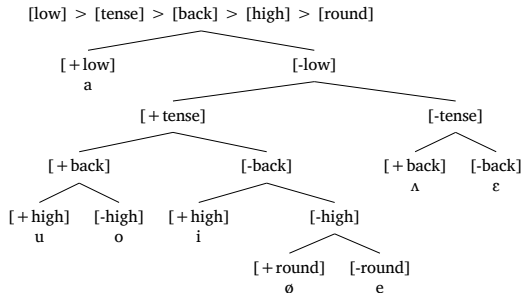
If [tense] was highest

- ▶ /a/ would be [-tense].
- ▶ [+tense] vowels /i, u, e, ø, o/ could not divide for [low]. So, /i/ would be unspecified for [low].
- ▶ Since /i/ triggers /a/ raising /i/ must be specified for [-low].
- ▶ Therefore [low] > [tense]

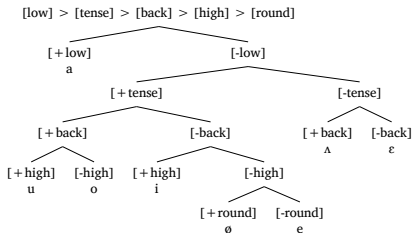
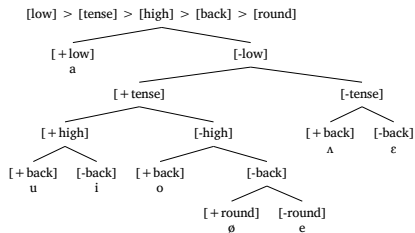


If [round] was ordered above [tense]

- ▶ The [+round] vowels /u, o, ø/ would not be specified for [tense].
- ▶ They must be specified though for tense because that is necessary to trigger the alternation.
- ▶ Therefore we order it next: [low] > [tense] > [back or high?] > [round]
- ▶ [round] is not necessary to distinguish /e, o/ & /i, u/.

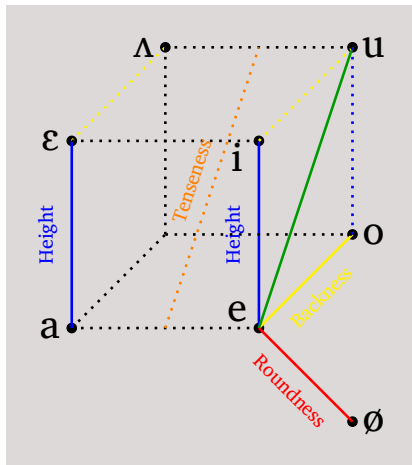


Two plausible options..



Summary

- ▶ Cube visualizes the feature space.
- ▶ Solid lines indicate alternations.
- ▶ Dashed lines indicate non-alternating contrasts.



Other observations

- 1 Tense vs. Lax
 - ▶ If we have [lax] instead of tense, then /e/ is specified as [-] for every feature.
- 2 Privative vs. Binary
 - ▶ If the features become privative, then /e/ is the featureless vowel, which corresponds with it being the neutral vowel.
 - ▶ Since every rule spreads [+] and not [-], each rule is viable in a privative system.
 - ▶ Privativity can also help explain why /e/ is the target of assimilation (cf. Search and Copy, Nevins 2010).

Conclusion

- ▶ Takestani is an understudied language with a rich system of morpho-phonology in its verbal inflectional system.
- ▶ There are several vowel alternations and an unusual phonemic system with a /e, ø/ contrast without a /i, y/ contrast.
- ▶ With the lens of the contrastive hierarchy, the minimally necessary featural contrasts are revealed.

Thank you!

dast-i	dard	ne-ijar-e
dəs-i	dar	n-ijar-e
hand-2S	pain	NEG-do-3SM

- ▶ *'No pain to your hand'*
- ▶ = Thank you!

- ▶ **Questions/comments?**
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