Harmony and disharmony in Jewish Urmi

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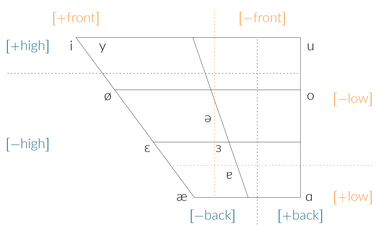
BACKGROUND



Jewish Urmi vowel inventory

Map of North-Eastern Neo-Aramaic languages
(adapted from Khan 2008: 4)

FRONTNESS HARMONY

(1) The harmonic feature is [±front] (Khaloo 2025: cf. Hoberman 1988, Khan 2008)

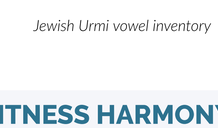
Contexts	Example stems			
All [+front]	[ø̟rt̟y̟g]	‘rug’	[dæ̟r̟ø̟l̟ɛ]	‘to put’
All [−front]	[o̠rdu̠]	‘army’	[bɐ̠t̠o̠lɜ]	‘to stop working’

(2) Affix vowels alternate based on root [±front] value

[+fr] ~ [−fr]	Examples of affix alternations		
[y̟] ~ [u̠]	[æ̟ql–y̟x] ‘their foot’	~	[ɑ̠ql–u̠x] ‘their intelligence’
[ø̟] ~ [o̠]	[æ̟ql–ø̟x] ‘your foot’	~	[ɑ̠ql–o̠x] ‘your intelligence’
[ɛ̟] ~ [ɜ̠]	[bɛ̟–æ̟ql] ‘without (a) foot’	~	[bɜ̠–ɑ̠ql] ‘without intelligence’
[æ̟] ~ [ɐ̠]	[xæ̟–æ̟ql] ‘(a) foot’	~	[xɐ̠–ɑ̠ql] ‘(an) intelligence’

(3) Bidirectional spreading of [±front] from the stem displaces potentially conflicting affix vowel specifications

a. [+fr] spreads R to suffixes

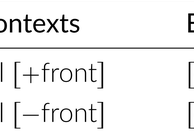


‘their foot’

c. [+fr] spreads L to prefixes

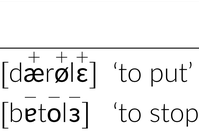
‘without (a) foot’

b. [−fr] spreads R to suffixes



‘their intelligence’

d. [−fr] spreads L to prefixes



‘without intelligence’

DISHARMONIC STEMS

(4) a. Disyllabic stems with /ɑ/

Contexts	Example stems	
Before [+front]	*unattested*	
After [+front]	[d̟y̟ʃmɑ̠n]	‘enemy’
Before [−front]	[qɑ̠ʃo̠q]	‘spoon’
After [−front]	[du̠mɑ̠n]	‘blizzard’

b. /ɑ/ is [−front] and opaque to harmony

Stem		Affix harmony	
[d̟y̟ʃmɑ̠n]	‘enemy’	[d̟y̟ʃmɑ̠n-o̠x]	‘your enemy’
		[xæ̟-d̟y̟ʃmɑ̠n]	‘(an) enemy’

(5) a. Disyllabic stems with /i/

Contexts	Example stems	
Before [+front]	[f̟ɪ̟t̟y̟]	‘whistle (n.)’
After [+front]	[mæ̟ʃ̟ɪ̟t]	‘mosque’
Before [−front]	[sɪ̟mɑ̠n]	‘congratulations (n.)’
After [−front]	[mo̠rɪ̟d]	‘follower’

b. /i/ is [+front], but transparent to harmony

Roots		Affix harmony	
[tɪ̟k]	‘piece’	[tɪ̟k-ø̟x]	‘your piece’
		[xæ̟-tɪ̟kɑ̠]	‘(a) piece’
[mo̠rɪ̟d]	‘follower’	[mo̠rɪ̟d-o̠x]	‘your follower’
		[xɐ̠-mo̠rɪ̟d]	‘(a) follower’

(6) a. Disyllabic stems with /ə/

Contexts	Example stems	
Before [+front]	[pə̟r̟y̟g]	‘finish (n.)’
After [+front]	[mæ̟dʒl̟ə̟s]	‘council, parliament’
Before [−front]	[ə̟ʃkɑ̠p]	‘cupboard’
After [−front]	[xo̠rə̟z]	‘rooster’

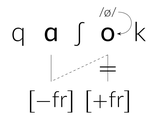
b. /ə/ is [+front], but transparent to harmony

Roots		Affix harmony	
[lə̟b:]	‘towel’	[lə̟b:-ø̟x]	‘your towel’
		[xæ̟-lə̟b:ɑ̠]	‘(a) towel’
[xo̠rə̟z]	‘rooster’	[xo̠rə̟z-o̠x]	‘your rooster’
		[xɐ̠-xo̠rə̟z]	‘(a) rooster’

OPACITY AND NON-DERIVED ENVIRONMENT BLOCKING

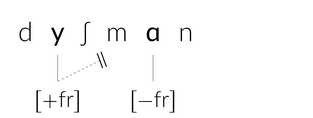
(7) Opaque (c) and NDE blocking (d) of spreading of [±front]

a. [−fr] spreads R from /ɑ/



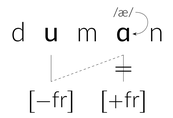
‘spoon’

c. [+fr] fails R spread to /ɑ/



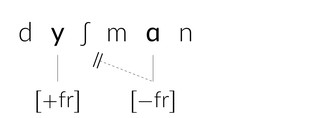
‘enemy’

b. [−fr] spreads R to /æ/→[ɑ]



‘rug’

d. [−fr] fails L spread in NDE

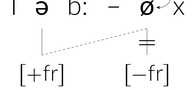


‘enemy’

TRANSPARENCY

(8) Spreading from the stem, but no blocking

a. [+fr] spreads from /ə/



‘your towel’

b. [−fr] spreads through /ə/

‘your rooster’

COMPUTATIONAL ANALYSIS

(9) Boolean Monadic Recursive Schemes (BMRS; Chandlee & Jardine 2021)

a. Structure-sensitive tier projection (Mayer & Major 2018, De Santo & Graf 2019)

$$\mathcal{T}_{\texttt{fr}}(x) := \begin{array}{l}\texttt{IF syll}(x)\ \texttt{THEN}\\ \quad\texttt{IF stem}_1(x)\ \texttt{THEN}\ \top\\ \quad\texttt{ELSE}\\ \quad\quad\texttt{IF}\ /\text{i, ə}/(x)\ \texttt{THEN}\ \bot\\ \quad\quad\texttt{ELSE}\ \top\\ \texttt{ELSE}\ \bot\end{array}$$

if x is a vowel, then
  if x is also stem-initial, then x projects to $\mathcal{T}_{\texttt{fr}}$;
  otherwise, (i.e. if x is a V but not also stem-initial)
    if x is /i, ə/, then x does not project;
    otherwise, x projects; (i.e. if x is a vowel other than /i,ə/)
otherwise, x does not project (i.e. if x is not a vowel)

b. Spreading and blocking on the projected tier (Nelson & Baković 2025)

$$\phi_{\texttt{fr}}(x) := \begin{array}{l}\texttt{IF}\ \mathcal{T}_{\texttt{fr}}(x)\ \texttt{THEN}\\ \quad\texttt{IF stem}_1(x)\ \texttt{THEN fr}(x)\\ \quad\texttt{ELSE}\\ \quad\quad\texttt{IF}\ \phi_{\texttt{fr}}(p(x))\ \texttt{THEN}\\ \quad\quad\quad\texttt{IF}\ /\text{ɑ}/(x)\ \texttt{THEN fr}(x)\\ \quad\quad\quad\texttt{ELSE}\ \top\\ \quad\quad\texttt{ELSE}\ \phi_{\texttt{fr}}(s(x))\\ \texttt{ELSE fr}(x)\end{array}$$

if x is projected to $\mathcal{T}_{\texttt{fr}}$, then
  if x is also stem-initial, then x is faithful;
  otherwise, (i.e. if x is not also stem-initial)
    if x's predecessor is [+fr], then
      if x is also /ɑ/, then x is faithful;
      otherwise, x is also [+fr]; (i.e. if x is not also /ɑ/)
    otherwise, x agrees with its successor;
      (i.e. if x is not stem-initial, nor /ɑ/, nor preceded by a [+fr] V)
otherwise, x is faithful (i.e. if x is not projected to $\mathcal{T}_{\texttt{fr}}$)

References cited. Chandlee, J. & A. Jardine. 2021. Computational universals in linguistic theory: Using recursive programs for phonological analysis. *Language* 97. • De Santo, A. & T. Graf. 2019. Structure sensitive tier projection: Applications and formal properties. *Formal Grammar* 2019. • Hoberman, R. D. 1988. Emphasis harmony in a modern Aramaic dialect. *Language* 64. • Khaloo, N. 2025. A (re)analysis of suprasegmental emphasis in Jewish Urmi. Ms., UCSD. • Khan, G. 2008. *The Jewish Neo-Aramaic dialect of Urmi*. Gorgias Press. • Mayer, C. & T. Major. 2018. A challenge for tier-based strict locality from Uyghur backness harmony. *Formal Grammar* 2018. • Nelson, S. & E. Baković. 2025. Feature spreading, redundancy, and blocking. Ms., UIUC and UCSD.