

## A Compendium of Synchronic Chain Shifts

This is a collection of known or alleged instances of the phonological phenomenon variously known as

- "counterfeeding"
- "synchronic chain shift"
- "underapplication"

Some are taken from secondary literature; others were found by flipping through reference grammars in the library looking for telltale phrases like "This rule does not apply to long vowels created by Rule 27". **Contributions are welcome, and contributors will be acknowledged.**

This list excludes chain shifts that have been reported to have a highly restricted morphological distribution (e.g., the examples discussed by Benua 1997). It includes some chain shifts whose existence is inferred via the Optimality-Theoretic assumption of "richness of the base" (Prince & Smolensky 1993:191): If all surface [y] are derived from underlying /x/, then underlying /y/ must surface as some unknown [z]. In reference grammars this shows up as "All surface geminates are derived by Rule 6".

The shorthand "X → Y → Z" is used to abbreviate the statement that underlying /X/ becomes surface [Y], while underlying /Y/ becomes surface [Z].

Language	Mapping	Sources
Barrow Inupiaq	igl → igl → igʌ	McCarthy 2002, Kaplan 1981 <i>Phonol. Issues in N. Alaskan Inupiaq</i>
Basaa	ɛ → e → i ɔ → o → u	Schmidt 1996 <i>Phonology</i>
Bdull Arabic	#VCC# → #'VCiC# → #VC'iC#	Bani-Yasin & Owens 1984 §1.3.e
Bedouin Arabic	badw → badu → bidu	McCarthy 1999 citing Al-Mozainy 1981
Bedouin Arabic	gabr → gabur → gibr	McCarthy 1999 citing no one
Bedouin Hijazi Arabic	a → i → ∅	Kirchner 1996 citing Al-Mozainy 1981 <i>Vowel Alternations...</i>
Catalan	nt# → n# → #	Boersma 1999 ROA 369, Wheeler 1979, Mascaró 1978

Language	Mapping	Sources
Chemehuevi	V <sub>1</sub> V <sub>2</sub> # □ V <sub>1</sub> # □ #	Press 1979 UC Pub Ling 92, §1.33.
Chukchee	#CCV □ #əCCV □ #əCCə [underlying ə can trigger harmony]	Spencer 1999 citing Bogoraz 1922
Egyptian Arabic	V:h# □ V:# □ V#	Michael Becker p.c. 2002
English (1)	p <sup>h</sup> t <sup>h</sup> k <sup>h</sup> □ p t k □ b d g	
English (2)	artə □ airə □ a:rə	Thomas 2000 <i>JPhonet.</i>
English (3)	nIs □ ns □ nts (doubtful)	Donegan & Stampe 1979 Dinnsen (ed.), <i>Current Approaches to Phonol. Theory</i> ,
English (4)	ard □ art □ art	B. L. Anderson (1999), NWAV 28.
Etxarri Navarrese Basque (similar processes in other W. Basque varieties)	e □ i □ iʸ o □ u □ uʷ	Kirchner 1995, citing de Rijk 1970 <i>Fontes Lg. Vasconum</i> 2(5):149-167
Finnish	pp tt kk □ p t k □ v t Ø (complex environment)	Jensen & Stong-Jensen in Koutsoudas 1976 (ed.) <i>Application and Ordering...</i>
Hellendoorn Dutch	ktn □ kn □ kj	van Oostendorp 2002 "Morphological recoverability"
Hidatsa	V <sub>1</sub> V <sub>2</sub> # □ V <sub>1</sub> # □ #	Kenstowicz & Kisseberth 1977:178f. citing Harris 1942
Icelandic	aCr# □ aCur# □ öCur#	Kenstowicz 1994:79–81.
Irish	ptk □ fhx □ Øh? (RotB for x □ ?)	Gnanadesikan 1997:189ff.. citing Ní Chiosáin 1991 diss.
Japanese	...toji □ ...toji □ doji	McCarthy 1999 citing Itô & Mester 1997
Karok	V:: □ V: □ V	Bright 1957 UC Pub Ling 13 §§321, 331
Lena Spanish	stressed i □ e □ a before u	Gnanadesikan 1997 diss, citing Hualde 1989 <i>Linguistics</i> art.
Mwera	mp □ mb □ m	Kenstowicz & Kisseberth 1977:157 citing Harries 1950
Mohawk	...VC?# □ ...'VCe? □ ...VC'e?	Halle & Clements 1983:121–123 citing Postal

Language	Mapping	Sources
Nzebi	a □ ε □ e □ i; o □ o □ u	Kirchner 1996 citing Guthrie 1969 <i>J Afr Lgs</i> 7(2):101-129
Nzema	nt □ nd □ nn	Clopper 2001 IULCWP 1
Ojibwa	nk □ ŋ □ unknown	McCarthy 1999 citing Kaye 1974
Palauan	u: □ u □ ə	Zuraw in press AFLA 8
Pipil	VwV{C/#} □ Vw{C/#} □ Vh{C/ #}	Campbell 1985:34
Polish	ki k'i tʃi	Lubowicz 2002 citing Rubach 1984:151–161.
Sanskrit	ai □ e: □ unknown au □ o: □ unknown	Gnanadesikan 1997 diss., citing Gonda 1966 ref grammar
Santiago Tzutujil	V?C <sup>2</sup> □ V:C <sup>2</sup> □ VC <sup>2</sup>	Dayley 1985 UC Pub Ling 107:44–45, 50
Sea Dyak	ŋga □ ŋa □ ŋã	Kenstowicz & Kisseberth 1979:298
Serbo-Croatian (1)	V(C)l# □ V'(C)o# □ V(C)o' #	Kenstowicz 1994:90–94
Serbo-Croatian (2)	VCC# □ V'CaC# □ VCa'C# (2 <sup>nd</sup> C +son)	Kenstowicz 1994:90–94
Southeastern Pomo	Ci □ iC □ eC (doubtful)	Moshinsky 1974 UC Pub Ling 72 §§3.2., 3.3.11, 3.3.13
Tarascan	ae □ ee □ e	Foster 1968 UC Pub Ling 56 §131
Toba Batak	nt □ tt □ ?t	Pater 1996/1999:16, citing Hayes 1986.
Tümpisa (Panamint) Shoshone	V □ V?V □ VV (very doubtful)	Dayley 1989 UC Pub Ling 115 §§ 9.3.5–6
Wikchamni Yokuts (1)	i: □ e □ unknown	Gamble 1978 UC Pub Ling 89 §158
Wikchamni Yokuts (2)	o...i □ u...i □ u...u	McCarthy 1999 citing Archangeli & Suzuki 1997:218ff.
Wintu (1)	rh □ □ □ unknown	Pitkin 1984 UC PUB Ling 94 §321; Laura Wilbur IUWPL 1
Wintu (2)	□CCa □ □Ca □ iCa	Pitkin 1984 UC PUB Ling 94 §§310, 321
Yagua	V <sub>1</sub> hV <sub>2</sub> □ V <sub>1</sub> V <sub>2</sub> □ V <sub>2</sub> V <sub>2</sub>	Payne & Payne 22.2.3 in

Language	Mapping	Sources
Yawelmani Yokuts (1)	u:-a □ o:-a □ o:-o	Darbyshire & Pullum 1986 <i>Hdbk</i> Newman 1944, Archangeli 1988 diss.; McCarthy 1999
Yawelmani Yokuts (2)	i:□ e/e:□ a/a:	McCarthy 1999 citing Kenstowicz & Kisseberth 1979:91ff

- Al-Mozainy, H. Q. 1981. Vowel Alternations in a Bedouin Hijazi Arabic Dialect: Abstractness and Stress. Ph. D. dissertation, University of Texas, Austin.
- Anderson, B. L. 1999. /ai/ Monophthongization among African-American Detroiters: Another Case of Dialect Leveling? Paper given at NWAV(E) 28, Toronto. Retrieved June 19, 2002, from [www-personal.umich.edu/~bleande/ba99nwave.pdf](http://www-personal.umich.edu/~bleande/ba99nwave.pdf).
- Archangeli, D., and K. Suzuki. 1997. The Yokuts challenge. In: I. Roca (ed.), *Derivations and constraints in phonology*. Oxford: Clarendon Press.
- Bani-Yasin, R., and J. Owens. 1984. The Bduul dialect of Jordan. *Anthropological Linguistics* 26(2): 202–232.
- Benua, Laura (1997). *Transderivational identity: phonological relations between words*. Ph. D. dissertation, University of Massachusetts, Amherst.
- Boersma, P. 1999. The phonology-semantics interaction in OT, and its acquisition. Ms., Rutgers Optimality Archive.
- Bogoraz, W.. 1922. Chukchee. In F. Boas (ed.), *Handbook of American Indian Languages*. Washington: Smithsonian Institution.
- Bright, W. 1957. *The Karok Language*. University of California Publications in Linguistics No. 13. Berkeley: University of California Press.
- Campbell, L., 1985. *The Pipil language of El Salvador*. Berlin: Mouton.
- Clopper, C. G., 2001. The Nzema verbal phrase: an Optimality-Theoretic account. In C. Clopper and K. de Jong (eds.), *Indiana University Linguistics Club Working Papers Online*, Vol. 1. Bloomington: Indiana University Linguistics Club. Retrieved June 19, 2002, from <https://www.indiana.edu/~iulcwp/pdfs/01-clopper04.pdf>.
- Dayley, J. P. 1985. *Tzutujil Grammar*. University of California Publications in Linguistics No. 107. Berkeley: University of California Press.
- Dayley, J. P. 1989. *Tümpisa (Panamint) Shoshone Grammar*. University of California Publications in Linguistics No. 115. Berkeley: University of California Press.
- de Rijk, R. 1970. Vowel interaction in Bizcayan Basque. *Fontes Linguae Vasconum* 2(5):149–167.
- Donegan, P. J., and D. Stampe. 1979. *The study of Natural Phonology*. In: I. Dinnsen (ed.), *Current Approaches to Phonological Theory*. Bloomington: Indiana University Press.
- Foster, M. L. 1969. *The Tarascan Language*. University of California Publications in Linguistics No. 56. Berkeley: University of California Press.
- Gamble, G. 1978. *Wikchamni Grammar*. University of California Publications in Linguistics No. 89. Berkeley: University of California Press.
- Gnanadesikan, A. 1997. *Phonology with Ternary Scales*. Ph. D. dissertation, University of Massachusetts, Amherst.
- Halle, M., and N. Clements (1983). *Problem Book in Phonology*. Cambridge, Mass.: MIT Press.
- Hayes, B. (1986). Assimilation as spreading in Toba Batak. *Linguistic Inquiry* 17:467–499.
- Hualde, J. I. 1979. Autosegmental and metrical spreading in the vowel-harmony systems of northwestern Spain. *Linguistics* 27:777–805.
- Itô, J., and R. A. Mester (1997). Correspondence and compositionality: The ga-gyo variation in Japanese. In: I. Roca (ed.), *Derivations and constraints in phonology*. Oxford: Clarendon Press.
- Jensen, J., and M. Stong-Jensen. 1976. Ordering and directionality of iterative rules. In A. Koutsoudas (ed.), *The Application and Ordering of Grammatical Rules*. The Hague: Mouton.
- Kaplan, L. 1981. *Phonological Issues in North Alaskan Inupiaq*. Fairbanks, AK: Alaska Native Language Center.
- Kaye, J. (1974). Opacity and recoverability in phonology. *Canadian Journal of Linguistics* 19:134–174.
- Kenstowicz, M. (1994). *Phonology in Generative Grammar*. Cambridge, Mass.: Blackwell.
- Kenstowicz, M., and K. Kisseberth. 1979. *Generative Phonology: Description and Theory*. San Diego: Academic Press.
- Kirchner, R. 1995. Going the distance: synchronic chain shifts in Optimality Theory. Ms., Rutgers Optimality Archive.
- Lubowicz, A. 2002. Derived-environment effects in Optimality Theory. *Lingua* 112:243–280.
- McCarthy, J. J. (1999) Sympathy and phonological opacity. *Phonology* 16:331–399.
- Moshinsky, J. B. 1974. *A Grammar of Southeastern Pomo*. University of California Publications in Linguistics No. 72. Berkeley: University of California Press.

- Newman, S. (1994). *The Yokuts language of California*. New York: Viking Fund.
- Pater, J. 1999. Austronesian Nasal Substitution and Other NC Effects. In Harry van der Hulst, René Kager, and Wim Zonneveld (eds.). *The Prosody Morphology Interface*. Cambridge University Press. 310-343.
- Payne, D. L., and T. E. Payne. 1990. Yagua. In: D. Derbyshire and G. Pullum (eds.), *Handbook of Amazonian Languages*, Vol. 2, pp. 249-474. Berlin: Mouton de Gruyter.
- Pitkin, H. 1984. *Wintui Grammar*. University of California Publications in Linguistics No. 94. Berkeley: University of California Press.
- Press, M. L. 1979. *Chemehuevi: A Grammar and Lexicon*. University of California Publications in Linguistics No. 92. Berkeley: University of California Press.
- Rubach, J. 1984. *Cyclic and Lexical Phonology: The structure of Polish*. Dordrecht: Foris.
- Schmidt, D. S. 1996. Vowel raising in Basaa: a synchronic chain shift. *Phonology* 13:239–267.
- Spencer, A. 1999. *Chukchee homepage: Phonology*. Retrieved June 19, 2002, from <http://privatewww.essex.ac.uk/~spena/Chukchee/chapter2.html>.
- Thomas, E. 2000. Spectral differences in /ai/ offsets conditioned by voicing of the following consonant. *Journal of Phonetics* 28:1–25.
- van Oostendorp, M. 2002. *Morphological recoverability in dialects of Dutch*. Ms., Meertens Instituut, Royal Netherlands Academy of Arts and Sciences. Retrieved June 19, 2002, from <http://www.vanoostendorp.nl/pdf/recoverable.pdf>.
- Wheeler, M. 1979. *Phonology of Catalan*. Oxford, U.K.: Blackwell.
- Zuraw, K. R. 2001. Vowel reduction in Palauan reduplicants. To appear in *Proceedings of AFLA 8*. Cambridge, MA: MIT Press.