Affix order and the availability of phonological information

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Affix order in Washo is phonologically conditioned. Modelling phonologically conditioned affix order (PCAO) requires "limited global" interaction of morphology and phonology.

Data

(1) léme?huyáša?i
le-íme?-**hu-áša?**-i
1SBJ-drink-**PL.INCL-NEAR.FUT**-IND
"We (incl.) are going to drink."

(2) léma?áša?é:si
le-íme?-**áša?-é:s**-i
1SBJ-drink-**NEAR.FUT-NEG**-IND
"I am not going to drink."

- from this data we might infer: PL.INCL-NEG
- instead, we find NEG-PL.INCL

(3) léme?é:shuyi
le-íme?-**é:s-hu**-i
1SBJ-drink-**NEG-PL.INCL**-IND
"We (incl.) are not drinking."

More Data

(4) gayáhayetihé:ša-i-š
ge-yáha-eti?-**hé:š-ha**-i-š
3OBJ-hurt-INCH-**Q-CAUS**-IND-SR
"Perhaps it started to hurt him."

(5) lakLášd̪imé:shayiŋa
le-kLášd̪im-**é:s-ha**-i=ŋa
3SBJ.1OBJ-hide-**NEG-CAUS**-IND=but
"But (they) don't conceal it from me."

(6) geyúliyé:sha
ge-yúli-**é:s-ha**
IMP-die-**NEG-CAUS**
"Don't kill it!"

- in addition to being **morphologically non-transitive**, these orders are **semantically opaque**

PCAO

- "phonologically conditioned affix order": semantically and/or morphologically unexpected affix order triggered by phonological constraint(s), affixes may be more than one segment long
- affix order in Washo is *non-transitive* (cf. Ryan 2010) and *opaque* (cf. Stiebels 2003), **but the deviations from "expected" affix order are not random, they can be explained by NonFinality-triggered avoidance of a stem-final stressed syllable**
- Washo (isolate, North America) is polysynthetic, mostly suffixing
- data from Jacobsen (1964, 1973), who also identified the pattern as phonologically conditioned

Partial Template

slot	-1	0	+1	**+2**	+3	**+4**	+5	+6	+7
morphemes	PERS.SUBJ	Verb	INCH	**PL.INCL**	NEAR.FUT	**NEG**	REC.PST	IND	SR
	PERS.OBJ		TRANS	**DU.INCL**		**Q**	DIST.FUT	DEP	
	IMP			**CAUS**			INT.FUT	REDUN	
				DUR				OPT	

Analysis

- Neg-R: assign * for every morpheme intervening between NEG and the right edge of PrWd (compare McCarthy & Prince 1993)
- NonFinality: assign * for a stressed syllable that is final in PrWd (Prince & Smolensky 2004)
- Máx: assign * for a syllable that is stressed in the Input but not in the Output (cf. Pater 2000)
- *Clash: assign * for a stressed syllable that is immediately followed by another stressed syllable (Kager 1999)

Stratum 1: Stem-level suffixes

- the "PCAO"-case: NonFinality forces violation of the alignment constraints

(7)

/íme?/, /hu/, /é:s/	*Clash	Máx	NonFinality	Neg-R	Incl-R
a. íme?-hu-é:s			*!		*
☞ b. íme?-é:s-hu				*	

- if the last syllable is not stressed in the candidate with the order of affixes corresponding to the ranking of alignment constraints at the time of evaluation of Stratum 1, NonFinality will be satisfied and the order will stay as expected, as in (1)

(8)

/íme?/, /hu/, /ášaʔ/	*Clash	Máx	NonFin	Near.Fut-R	Incl-R
☞ a. íme?-hu-ášaʔ					*
b. íme?-ášaʔ-hu				*!	

- NonFinality-driven reordering is blocked exactly in the cases where it would give rise to a clash, as in (2)

(9)

/íme?/, /ášaʔ/, /é:s/	*Clash	Máx	NonFin	Neg-R	Near.Fut-R
☞ a. íme?-ášaʔ-é:s			*		*
b. íme?-ášaʔ-es		*!			*
c. íme?-é:s-ášaʔ	*!			*	
d. íme?-es-ášaʔ		*!		*	

- the unstressed slot +2 affixes are also correctly predicted to be displaced across two other affixes if that avoids violation of any phonological constraint
- this also makes an analysis of this phenomenon as infixation (see Paster 2006) implausible: infixation cannot change the respective order of other affixes

(10)

/íme?/, /hu/, /ášaʔ/, /é:s/	*Clash	Máx	NonFin	Neg-R	N.Fut-R	Incl-R
a. íme?-hu-ášaʔ-é:s			*!		*	**
b. íme?-hu-ášaʔ-es		*!			*	**
☞ c. íme?-ášaʔ-é:s-hu				*	**	
d. íme?-é:s-hu-ášaʔ				**!		*
e. íme?-é:s-ášaʔ-hu	*!			**	*	

Properties of the proposal...

1. $P \gg M$

- morphological alignment constraints are outranked by phonological constraints within the same module
- the analytical intuition: **affixes may move to obey constraints on stress distribution, the stress itself may not**
- morphemes are unordered in the input
- **NonFinality can cause violation of alignment**, but alignment is violated minimally; this may result in a non-transitive, potentially opaque order which is passed on to Stratum 2

2. Stratal Organization

- only the stem-level affixes are present at Stratum 1
- evidence for the "cut-off point" comes from imperatives and nominalizations, which include stem-level, but not word-level affixes
- on Stratum 2, prefixes and word-level suffixes are added; the word-level suffixes are never stressed, so they never violate NonFinality
- however, if the order of affixes has already been changed on Stratum 1, the addition of these later suffixes **counter-bleeds** the change
- it is this counter-bleeding opacity that makes strata a necessary component of this proposal

(11) léme?é:shuyi
le-íme?-**é:s-hu**-i
1SBJ-drink-**NEG-PL.INCL**-IND
"We (incl.) are not drinking."

(12)

/íme?é:shu/, /le/, /i/	P-L	Mood-R	*Clash	Max-Str	NonFin
a. le-íme?é:shu-i		*!			
☞ b. le-íme?é:shu-i					
c. íme?é:shu-le-i	*!				

...and why they matter

- the extent to which phonological effects on morphology are derived and predicted in serial and parallel models differs dramatically (see discussion in Embick 2010)
- PCAO in Stratal OT instantiates what Embick (2010) calls "limited global" interaction of morphology and phonology
- strata are not just a necessary evil (recall: they are introduced to model opacity), they also **restrict phonologically conditioned morphology to the stratum as a locality domain**
- Embick's (2010) claim about the locality of interaction between morphology and phonology is too strong (see Deal & Wolf 2017 for a similar argument based on data from outward-sensitive phonologically conditioned allomorph selection in Nez Perce)
- a morphological operation (like Local Dislocation) cannot capture this phenomenon without reference to phonology

References

Deal, Amy Rose and Matthew Wolf (2017): Outwards-sensitive phonologically conditioned allomorphy in Nez Perce. In: V. Gribanova and S. Shih, eds, The Morphosyntax-Phonology Connection. Oxford University Press, Oxford, pp. 29–60. **Embick**, David (2010): Localism versus globalism in morphology and phonology. MIT Press, Cambridge. **Jacobsen**, William H. (1964): A grammar of the Washo language. PhD thesis, University of California, Berkeley. **Jacobsen**, William H. (1973): A rhythmic principle in Washo morphotactics. Presentation at Symposium on California Indian Linguistics. **Kager**, René (1999): Optimality Theory. Cambridge University Press, Cambridge. **McCarthy**, John J. and Alan Prince (1993): Generalized Alignment. In: G. E. Booij and J. van Marle, eds, Yearbook of Morphology 1993. Kluwer, Dordrecht, p. 79–153. **Paster**, Mary (2006): Phonological Conditions on Affixation. PhD thesis, University of California, Berkeley. **Pater**, Joe (2000): 'Non-uniformity in English secondary stress : the role of ranked and lexically specific constraints', Phonology 17, 237–274. **Prince**, Alan and Paul Smolensky (2004): Optimality Theory: Constraint Interaction in Generative Grammar. Blackwell, Oxford. **Ryan**, Kevin M. (2010): 'Variable affix order: grammar and learning', Language 86, 758– 791. **Stiebels**, Barbara (2003): Transparent, restricted and opaque affix orders. In: U. Junghanns and L. Szucsich, eds, Syntactic structures and morphological information. Mouton de Gruyter, Berlin, pp. 283–315.