

Modelling Exponents

Ash Asudeh & Tina Bögel & Dan Siddiqi

October 29, 2022
SE-LFG

Introduction

$$(1) \quad \langle \dots, \dots, \dots \rangle \xrightarrow{\nu} \left[\begin{array}{l} \text{PHON(OLOGICAL)} \\ \text{REP(RESENTATION)} \quad \textit{phonological realization \& conditions} \\ \text{P(ROSODIC)FRAME} \quad \textit{prosodic unit} \\ \text{P(ROSODIC)LEVEL} \quad 1 \mid 2 \\ \text{DEP(ENDENCE)} \quad \{ \text{LT, RT} \} \\ \text{CLASS} \quad \{ \textit{inflectional classes} \} \\ \text{TYPE} \quad \text{VERBAL} \mid \text{NOMINAL} \mid \text{ADJECTIVAL} \\ \\ \text{HOST} \quad \left[\begin{array}{l} \text{IDENT(ITY)} \quad \text{AUNT} \mid \text{NIECE} \\ \left\{ \begin{array}{l} \text{PHON.REP} \quad \dots \\ \text{PFRAME} \quad \dots \\ \text{PLEVEL} \quad \dots \\ \text{CLASS} \quad \dots \\ \text{TYPE} \quad \dots \end{array} \right\} \end{array} \right] \end{array} \right]$$

$$(2) \quad \langle [v], \Phi\{ \}, \lambda P. \text{CAUSE}(\text{BECOME}(P)) \rangle \xrightarrow{\nu} \left[\begin{array}{l} \text{PHON.REP} \quad /ə\text{n}/ \\ \text{PFRAME} \quad (\dots (\cdot)_{\sigma})_{ft} \\ \text{PLEVEL} \quad 1 \\ \text{DEP} \quad \text{LT} \\ \text{CLASS} \quad \textit{weak} \\ \text{TYPE} \quad \text{VERBAL} \\ \\ \text{HOST} \quad \left[\begin{array}{l} \text{IDENT} \quad \text{NIECE} \\ \left\{ \left[\begin{array}{l} \text{PHON.REP} \quad / \dots [\mathbf{obs}] / \\ \text{PFRAME} \quad (\cdot)_{\sigma} \\ \text{TYPE} \quad \text{ADJECTIVAL} \end{array} \right] \right\} \end{array} \right] \end{array} \right]$$

- We adopt the convention of writing the value of a set-valued feature without set-brackets when it is a singleton set; e.g. [CLASS *weak*] instead of [CLASS {*weak*}].

1 Phonological Features

1.1 Phonological Representation

- Conditions on mapping to output phonological form
 - Can be underspecified (-s, -z)
 - Can be a memorized, conditioned list (*a/an*, French liaison)

1.2 Prosodic Frame

- Conditions on mapping to output prosody
 - F@#!-insertion
 - *-um-* infixation (Austronesian)

1.3 Prosodic Level

- Specifies in which prosodic level the v-structure is integrated into prosody (primary vs secondary affixes)
 - English geminates
 - Germanic prefixes

1.4 Dependence

- The direction of the dependency
- Left, right, or both (infix)
 - {LT} := suffix (“I am dependent to the left”)
 - {RT} := prefix (“I am dependent to the right”)
 - {LT,RT} := infix (“I am dependent to the left and to the right”)

2 Morphological features

2.1 Class

- Inflectional class
 - Latin declension and conjugation

2.2 Type

- Verbal vs Nominal vs Adjectival
 - Agreement morphology (ϕ -features)

3 Morphosyntactic features

3.1 Host

- The value of the HOST attribute is a hybrid object that contains the IDENT(ITY) feature and a v-structure that has features PHON.REP, PFRAME, CLASS, and TYPE.
- The HOST feature does not contain DEPENDENCY: locality

3.1.1 Identity

- The identity of the c-structural correspondent of the p-structure element I am dependent on
- Aunt, niece
 - Aunt := The site is the v-structure that realizes my c-structure aunt
(the aunt is the c-structure head that has selected for the c-structure phrase that my expendendum heads)
 - Niece := The site is the v-structure that realizes my c-structure niece
(the niece is the head of the c-structure phrase that my expendendum takes as its c-structure complement)

Summary

$$(3) \quad \langle \dots, \dots, \dots \rangle \xrightarrow{\nu} \left[\begin{array}{l} \text{PHON(OLOGICAL)} \\ \text{REP(RESENTATION)} \quad \textit{phonological realization \& conditions} \\ \text{P(ROSODIC)FRAME} \quad \textit{prosodic unit} \\ \text{P(ROSODIC)LEVEL} \quad 1 \mid 2 \\ \text{DEP(ENDENCE)} \quad \{ \text{LT, RT} \} \\ \text{CLASS} \quad \{ \textit{inflectional classes} \} \\ \text{TYPE} \quad \text{VERBAL} \mid \text{NOMINAL} \mid \text{ADJECTIVAL} \\ \\ \text{HOST} \quad \left[\begin{array}{l} \text{IDENT(ITY)} \quad \text{AUNT} \mid \text{NIECE} \\ \left(\begin{array}{l} \text{PHON.REP} \quad \dots \\ \text{PFRAME} \quad \dots \\ \text{PLEVEL} \quad \dots \\ \text{CLASS} \quad \dots \\ \text{TYPE} \quad \dots \end{array} \right) \end{array} \right] \end{array} \right]$$

4 MostSpecific

- L_{RFG} posits a constraint on the expression of phonological information, i.e. *morphophonology*, which we have called **MostSpecific**. Let V^o be the co-domain of the exponence function ν in some language L , i.e. the set of outputs of Vocabulary Items in L . We write $V^o(\alpha)$ to indicate the co-domain of some particular Vocabulary Item, α — i.e., the output vocabulary structure.
- **MostSpecific**(α, β) returns whichever Vocabulary Item has the most restrictions on its phonological context.
- The proper subsumption relation on feature structures — i.e., v-structures — is used to capture the intuition (below).
- Let V^o be the co-domain of the exponence function ν in some language L , i.e. the set of outputs of Vocabulary Items in L . We write $V^o(\alpha)$ to indicate the co-domain of some particular Vocabulary Item, α — i.e., the output vocabulary structure.
- The proper subsumption relation on feature structures — i.e., v-structures — is used to capture the intuition (below).

(4) Given two Vocabulary Items, α and β ,

$$\mathbf{MostSpecific}(\alpha, \beta) = \begin{cases} \alpha & \text{if } (V^o(\beta) \text{ HOST}) \sqsubset (V^o(\alpha) \text{ HOST}) \\ \beta & \text{if } (V^o(\alpha) \text{ HOST}) \sqsubset (V^o(\beta) \text{ HOST}) \\ \perp & \text{otherwise} \end{cases}$$

- The intuition behind **MostSpecific** is to prefer affixes, whenever possible. In terms of information encoded in Vocabulary Items, choose the VI whose output v-structure has more specific content in the HOST feature.
- *-er vs more*
- *Do-support*

5 Dependency: Classifying forms

1. Free form

$$(5) \begin{bmatrix} \text{PHON.REP} & \dots \\ \text{PFRAME} & \dots \end{bmatrix}$$

2. Clitic (simple clitics/leaners/phrasal affixes)

$$(6) \begin{bmatrix} \text{PHON.REP} & \dots \\ \text{PFRAME} & \dots \\ \text{DEP} & \dots \end{bmatrix}$$

- (7) a. The car's fender English possessive 's
 b. The car you are in's fender
 c. The car you are exiting's fender
- (8) a. The person who arrives first'll leave last English "contractions"

3. Clitic (special clitics/DM: clitics)

$$(9) \begin{bmatrix} \text{PHON.REP} & \dots \\ \text{PFRAME} & \dots \\ \text{DEP} & \dots \\ \text{HOST} & [\text{IDENT } \dots] \end{bmatrix}$$

- For example, Spanish object clitics would have v-structures that contain the following information:

$$(10) \begin{bmatrix} \text{PHON.REP} & \dots \\ \text{PFRAME} & \dots \\ \text{DEP} & \text{LT} \mid \text{RT} \\ \text{HOST} & [\text{IDENT} \quad \text{AUNT}] \end{bmatrix}$$

- (11) a. [DEP RT] captures proclisis on AUNT

Lo=me=diga
3.SG.MASC=1.SG=say.IMP
'Tell me it'

Spanish pronominal objects

- b. [DEP LT] captures enclisis on AUNT

Diga=me=lo
say.IMP=1.SG=3.SG.MASC
'Tell me it'

4. Affix (secondary/level 2/unrestricted)

$$(12) \begin{bmatrix} \text{PHON.REP} & \dots \\ \text{PFRAME} & \dots \\ \text{PLEVEL} & 2 \\ \text{DEP} & \dots \\ \text{HOST} & [\text{IDENT } \dots] \end{bmatrix}$$

- (13) *unnatural*

English morpheme-boundary geminates

5. Affix (primary/level 1/restricted)

$$(14) \begin{bmatrix} \text{PHON.REP} & \dots \\ \text{PFRAME} & \dots \\ \text{PLEVEL} & 1 \\ \text{DEP} & \dots \\ \text{HOST} & [\text{IDENT } \dots] \end{bmatrix}$$

- (15) *illogical*
("i-logical" not "ill-logical")

No English morpheme-boundary geminates

5.1 Factorial typology over DEP × HOST

	DEP Y	DEP N
HOST Y	<i>affix</i>	<i>(special) clitic</i>
HOST N	<i>leaner/ (simple) clitic</i>	<i>free form</i>

6 An example: *-en*

- The English affix *-en*, as in *blacken*, is perfectly productive assuming certain phonological well-formedness conditions.
- In particular, the output form of the base must be no longer than one syllable and end in an obstruent, optionally preceded by a sonorant (per Halle 1973).
- For example, *moisten* is legal despite a seemingly illegal base, because the final /t/ in the base is not present in the output [mɔɪsɪn].
- The affixed form must meet conditions on the host ([HOST PFRAME ...])
- The affix is a syllable that is the last in its foot. ([PFRAME (...)(·)_σ]_{ft}).
- The resulting verb does not take the irregular verbal *-en* (e.g., *written*) in the past participle ([CLASS *weak*]).¹
- The resulting verb does not itself trigger *do*-support ([TYPE VERBAL]).
- The affix can only attach to adjectives ([HOST TYPE ADJECTIVAL]).
- The affix is dependent to its left; it is a suffix ([DEP LT]).
- The affix “lowers” to the head of the complement of the affix ([HOST IDENT NIECE]).

$$(16) \langle [v], \Phi \{ \}, \lambda P. \text{CAUSE}(\text{BECOME}(P)) \rangle \xrightarrow{\nu} \left[\begin{array}{l} \text{PHON.REP} \quad /ən/ \\ \text{PFRAME} \quad (\dots (\cdot)_{\sigma})_{ft} \\ \text{PLEVEL} \quad 1 \\ \text{DEP} \quad \text{LT} \\ \text{CLASS} \quad \textit{weak} \\ \text{TYPE} \quad \text{VERBAL} \\ \text{HOST} \quad \left[\begin{array}{l} \text{IDENT} \quad \text{NIECE} \\ \left\{ \left[\begin{array}{l} \text{PHON.REP} \quad / \dots [\mathbf{obs}] / \\ \text{PFRAME} \quad (\cdot)_{\sigma} \\ \text{TYPE} \quad \text{ADJECTIVAL} \end{array} \right] \right\} \end{array} \right] \end{array} \right]$$

¹This is meant to be illustrative of the feature CLASS; it is likely unnecessary for contemporary English.

