

Modelling Exponents

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This paper discusses the interface between (lexical) morphology and phonology in the recently established L_RFG framework (see, e.g., Asudeh and Siddiqi 2022 and references therein). In particular, it focuses on the morphological and phonological constraints modelled in v(ocabulary)-structure, the output of the ν -mapping from c-structure, and how different Vocabulary Items (VIs) interact and map to surface prosody and phonology. The goals of this paper are as follows: 1) Develop a model of what is on the right side of the exponence function, 2) Describe a factorial typology of phonological dependence in formal terms, and 3) Exemplify the system with the English deadjectivizing verbalizer affix *-en*.

Example (1) shows the template for a VI entry, which contains morphological, morphosyntactic, and phonological features and constraints.

(1)	⟨ ..., ..., ... ⟩	$\xrightarrow{\nu}$	<table style="border-collapse: collapse; width: 100%;"> <tr> <td style="padding: 2px;">PHON(OLOGICAL)</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">REP(RESENTATION)</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"><i>phonological realization & conditions</i></td> </tr> <tr> <td style="padding: 2px;">P(ROSODIC)FRAME</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"><i>prosodic unit</i></td> </tr> <tr> <td style="padding: 2px;">DEP(ENDENCE)</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">{ LT, RT }</td> </tr> <tr> <td style="padding: 2px;">M(ORPHOPHONOLOGICAL)DOMAIN</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">1 2</td> </tr> <tr> <td style="padding: 2px;">CLASS</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">{ <i>inflectional classes</i> }</td> </tr> <tr> <td style="padding: 2px;">TYPE</td> <td style="padding: 2px;"></td> <td style="padding: 2px;">VERBAL NOMINAL ADJECTIVAL</td> </tr> <tr> <td style="padding: 2px;">HOST</td> <td style="padding: 2px;"></td> <td style="padding: 2px;"> <table style="border-collapse: collapse; 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Phonological features and constraints

- PHONREP contains the phonological representation in terms of basic segments. We assume that the form can be underspecified in terms of features. It can also be a memorized, conditioned list, as it is the case with the phonologically conditioned allomorphs of the English indefinite article *a/an*.
- PFRAME determines the prosodic/metrical frame. For example, *swear*-insertion in English is sensitive to foot structure: $(Ala)_{ft}-(fucking)_{ft}-(bama)_{ft}$. Similarly, *-um*-infixation in (Austronesian) is sensitive to syllable structure (Roark and Sproat 2007, 30–31, Orgun and Sprouse 1999, 204).
- DEP describes the dependencies of the VI: to the left (LT), to the right (RT), or both.
- MDOMAIN specifies at which morphophonological domain the constraints on the v-structure are evaluated (e.g., primary vs. secondary affixes). For example, English geminates can only appear as secondary morpheme boundaries. Similarly, some Germanic prefixes are footed and are therefore primary affixes and others are not.

Morphological features and constraints

- CLASS stores morphology-specific information such as declension or conjugation.
- TYPE specifies coarse-grained morphological categories (verbal vs nominal vs adjectival). For example, verbal reflexes of agreement features are realized via subject agreement, while nominal reflexes of these features are realized via pronouns, and adjectival reflexes are realized via nominal concord.

Morphosyntactic features and constraints

- HOST has a value that is a hybrid object. HOST captures constraints on the host in terms of the features and constraints discussed above. HOST also contains an IDENTITY attribute.
- IDENTITY describes the identity of the c-structure and f-structure correspondents of the host v-structure. The feature IDENTITY thus regulates vocabulary insertion. There are two possible values for IDENTITY: AUNT and NIECE. Both involve reference to c-structure and f-structure.

An example. The approach will be exemplified with an analysis of the English affix *-en*, as in *blacken*. This affix is productive (i.e., works for appropriate nonce words) but has lots of constraints on its distribution, which are captured in its v-structure:

- The affix is consistently pronounced as /ən/: [PHONREP /ən/]
- It is a syllable that is the last in its foot: [PFRAME (...)(·)_σ]_{ft}]
- Its form is subject to local word-level phonotactics, which indicates it is a primary affix: [MDOMAIN 1]
- It is dependent to its left; i.e. it is a suffix: [DEP LT]
- The resulting verb is a weak verb (in the Germanic sense); e.g. it takes *-ed* in the past participle, unlike strong verbs like *write*, which take *-en*. For the purpose of illustration, we identify two classes in English, *weak* and *strong*: [CLASS *weak*]
- It ‘lowers’ to the head of its complement: [HOST IDENT NIECE]
- The affixed form must meet phonological and prosodic conditions on the host. In the case of *-en*, 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, *soften* is legal despite a seemingly illegal base, because the final /t/ in the base is not present in the output [sɒfən]. It can be assumed that this is a phonological constraint on the host and not a general phonological rule in English, because unaffixed forms with similar phonology are legal (e.g., **dryen* but *lion*, **dimmen* but *women*): [HOST {[PHON.REP /... ([son])[obs]/}] & [HOST {[PFRAME (...)_σ}]
- The affix *-en* can only attach to adjectives: [HOST {[TYPE ADJECTIVAL]}]

Vocabulary Item for *-en*. The complete VI for *-en* is shown in (2); the righthand side of $\xrightarrow{\nu}$ is the v-structure.

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

In the equivalent description below, ● is used to represent “this v-structure” and · to represent “the p-structure correspondent of this v-structure” (i.e., ρ(●)).

$$(3) \quad \begin{array}{ll} (\bullet \text{ PHON.REP}) = /ən/ & (\bullet \text{ TYPE}) = VERBAL \\ (\bullet \text{ PFRAME}) = (...)(\cdot)_{\sigma}]_{ft} & (\bullet \text{ HOST IDENT}) = NIECE \\ (\bullet \text{ PLEVEL}) = 1 & (\bullet \text{ HOST} \in \text{PHON.REP}) = /... ([son])[obs]/ \\ (\bullet \text{ DEPENDENCE}) = LT & (\bullet \text{ HOST} \in \text{PFRAME}) = (...)_σ \\ (\bullet \text{ CLASS}) = weak & (\bullet \text{ HOST} \in \text{TYPE}) = ADJECTIVAL \end{array}$$

