

## Output constraints and canonicity: Towards a typology of templates

The realization of morphosyntactic features can take many shapes; most common among them are the clearly concatenative prefixes and suffixes. The concatenation of affixes, however, is not the only way to derive new words. This paper investigates the role of templates in morphology and phonology and further suggests that templates are an emergent property of a constellation of well-known output constraints, and looks at the logical possibilities to arrive at a canonical definition of templates.

As a phenomenon, rather than a theoretical construct, templates refer not to classes of affixes and their concatenation methods, but rather to the (re)arrangement of segmental and supersegmental material between cells in a paradigm, sometimes called grades, measures, *'awzaan* or *binyanim*. The common relation between words in a family is one of linear and uniform correspondence among common exponents while templates, as typically conceived, force two or more morphemes into some specific pattern of arrangement. Operationally defined, a series of word-forms is templatic when its members correspond to particular fixed shapes; what exactly the nature of the shape can be is the topic of this paper.

Here I identify seven distinct types of output constraints which can be called templatic in a broad sense. While each is responsible for a template of its own, strictly speaking, they may combine forces to create extreme templates such as those found in Semitic. This represents a broadening of the

### 1. Sonority constraints

Sonority constraints enforce wellformedness at the syllable level based on a languages sonority scale. Cf. Sidamo (Hume 2004, citing Hudson 1975) /hab-nemmo/ [hambemmo] 'we forget'.

### 2. Feature type or OCP constraints

A language may be limited in what features it can express in a word. Such constraints may enforce vowel, nasal, pharyngeal, or consonant harmony. Tiene (Bantu; Hyman 2006, Hyman and Inkelas 1997) shows a template sensitive to both prosodic and segmental content. The stative/reversive morpheme has two allomorphs: /l/ and /k/ (with predictable vowel qualities). These are used as suffixes or infixes to fit a bisyllabic pattern in which the final consonant is not coronal while the medial consonant is: compare *ból-a* 'break' and *bólek-ε* 'be broken' with *kab-a* 'divide' and *kalab-a* 'be divided'.

### 3. Size constraints

Words may be subject to minimal or maximal size constraints in terms of the syllable or mora. Turkish shows this for some speakers (Inkelas and Orgun 1995) /fa + m/ [fa:m] 'my note Fa' where the vowel is lengthened to reach the bimoraic minimal word requirement.

### 4. Feature or segment position constraints

Feature or segment position constraints are well known from infixation (Yu 2007), which enforce a features or segments to be aligned with a particular pivot point in the word (edges or a prominent point such as stress). Choctaw exemplifies this (Broadwell 2006), which displays a five or six stem-internal modifications which express different meanings. Compare the following three basic verbs with their derived counterparts: basic *bashlih* 'he cut it' with the N-grade *báshlih* 'he keeps cutting it', basic *habishkoh* 'he sneezed' with HN-grade *habihíshkoh* 'he sneezed repeatedly', and basic *taloowah* 'he is singing' with the G-grade *tálooowah* 'he finally sang'. The internal changes include nasalization and high tone in the N-grade, an additional internal syllable (also nasalized and

bearing high tone) in the HN-grade, and high tone and geminateion in the G-grade.

5. **Stress pattern or weight constraints**

Languages may show restrictions on morphological operations based on the word's stress pattern. Booij (1998) shows that Dutch plurals, which take the allomorphs *-en* or *-s* in plural formation allow one to predict which allomorph is to be selected based on the phonological structure of the base, notably there is an output restriction that the Dutch plural should fill a trochaic template.

6. **Tone pattern constraints**

Like stress, tone may constrain word-forms in a template. Hausa's verbal grades show this, each grade is associated with a specific tone pattern which overwrites the basic grade 2 low-high pattern: *sàya*: 'G2 sell', *sayè*: 'G4 buy up', *sayar* 'G5 sell', *sayo*: 'G6 buy and bring', and *sàyu* 'G7 be well bought' (Newman 2000).

7. **Aesthetic constraints**

While not grammatically enforced in language, aesthetic constraints may be seen in the language arts. Different types of poetry can clearly be described as templatic: *haiku* poems show strict size constraints, consonance is a type of feature constraint, and rhyme, in general, shows feature position and stress constraints. One even sees semantic constraints in paired lexical items in Biblical Hebrew poetry.

Each of the grammatical constraints (excluding aesthetic constraints) is grounded in the familiar Articulation-Perception-Acquisition trichotomy. That is to say, any given template in a language should assist the speaker to pronounce the word, the listener to understand it, or the child to learn it and this fact motivates the appearance of templates (i.e. markedness constraints) of any sort in human language.

Furthermore, these constraints suggest a canonical approach to the study of templates (cf. e.g. Corbett 2005, 2007, 2008), which helps define the conceptual space in which templates are situated. Some criteria include:

I. **Prosodic governance: Non-Prosodic >> Prosodic**

Templates which are non-prosodic are more canonical than those which refer to authentic units of prosody (inverting the prosodic morphology hypothesis, McCarthy and Prince 1996, 1998)

II. **Cyclicity: Late >> Early**

Templates later in the derivational process are more canonical than those occurring early.

III. **Location: Internal >> External**

String internal changes are more canonical than external changes

IV. **Identity: Segmental >> Supersegmental or Subsegmental**

Changes based on entire segments are more canonical than those based on supersegmental or subsegmental changes.

This approach adds to generalized template theory (McCarthy and Prince 1996, McCarthy 2005 and references therein), wherein templates emerge from markedness constraints and is in line with Emergent Optimality Theory (Mohan 2009). The search for the repair strategies which various languages take when they encounter these constraints should determine the limits of templatic forms. For example, to the best of my knowledge, no language exposes a morphosyntactic feature with metathesis alone though metathesis without a basis in one of these constraints would be clearly and canonically templatic. These seven constraints, then, appear to be integral to human cognition and help define a theoretical space in which to measure templaticity.

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