The typology of templates

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Abstract
The notion of a template has been used in a number of linguistic domains to refer to grammatical patterns where the form of some linguistic constituent appears to be well conceptualized as consisting of a fixed linear structure, whether in terms of the arrangement of its subconstituents or its overall length. Most work on templates has restricted the topic of investigation to a single grammatical domain, e.g., morphophonology, rather than looking at templatic phenomena across grammatical domains. Such comparison reveals that a commonality among templatic constructions is that they involve 'unexpected' linear stipulation. This leaves open many questions regarding how they might be typologically compared, but the existing literature, nevertheless, indicates some dimensions of variation worthy of further investigation that could form the basis of a comprehen- sive study of template typology.

1. Templates: Often invoked, but undertheorized

The notion of a *template* has been used in linguistic analyses to refer to grammatical patterns where the form of some linguistic constituent appears to be well conceptualized via a fixed linear structure, whether in terms of ordering or length. To take two examples, consider Table 1, which schematizes the order of verbal morphemes across the Athabaskan family, and Table 2, which gives data illustrating the realization of a particular nickname formation strategy in Japanese.

POSITION	DESCRIPTION
1	Zero, one or more adverbial prefixes
2	The prefix for the iterative paradigm (lacking in some languages)
3	A pluralizing prefix
4	An object pronoun prefix, found only in transitive verbs and some passives
5	A deictic subject prefix
6	Zero, one, or two adverbial prefixes
7	A prefix marking mode, tense, or aspect
8	A subject pronoun prefix
9	A classifier prefix
10	A stem

Table 1: A pan-Athabaskan verbal template (Hoijer 1971:125)

REGULAR NAME	NICKNAME
hanako	*hana-tyan*
akira	*aki-tyan*
taroo	*taro-tyan*
yooko	*yoo-tyan*
ti	*tii-tyan*

Table 2: A Japanese nickname template (Poser 1990)

The pan-Athabaskan template described in table 1 characterizes verbs in this family as consisting of a series of "slots" into which morphemes of different grammatically-defined classes appear in left-to-right order. Hoijer (1971) does not explicitly use the word *template* to characterize his analysis, though this term is often found in the Athabaskanist literature to describe the verbal system (see, e.g., Rice (2000:9)). Section 2.5 will discuss, in detail, the issue of how we might rigorously define *template*, but at this point, it will be sufficient to say that the crucial feature of Hoijer's analysis which prompts use of the label is that the linear order of these verbal morphemes is treated as grammatically stipulated rather than deriving from general principles.

Poser (1990:81) does explicitly use the word *template* to describe the pattern exemplified in Table 2, wherein a full name in this nickname construction must be bimoraic, which can result in truncation of a longer name (e.g., *hanako* → *hana-*) or lengthening of a shorter name (e.g., *ti* → *tii-*). In this case, what makes this analysis templatic is the claim that a particular morphological element must be of a specific length regardless of what its length would be expected to be on the basis of its lexical segmental specification.

There are a number of complex questions one can pose in trying to come to an understanding of templatic constructions from a typological perspective. The two of primary interest in this

survey are: (i) What, if anything, unifies the grammatical patterns which have been labeled "templatic"? (ii) If there is a unified category of *template*, how can we usefully categorize different templatic constructions in a descriptive typology? As will be seen, templates are difficult phenomena to study since they appear to be defined in terms of linguists' often implicit expectations regarding the nature of linear stipulation in grammars. So, if they are to be studied typologically in a rigorous way, this will require a change in analytical perspective away from their often haphazard invocation as a descriptive device towards a precise specification of their properties within and across grammars.

The most noteworthy way in which this review differs from previous typologically oriented studies on templatic phenomena is that it does not restrict itself to any one domain of grammar, such as morphophonology (see, e.g., Downing (2006)) or morphosyntax (see, e.g., Simpson and Withgott (1986)), but rather looks at apparent templates across morphophonology, morphosyntax, and syntax. Such "cross-domain" studies of templates have not been the subject of extensive work (though, see, Good (2003, 2007)). Accordingly, our understanding of the typology of templates, in general terms, is still quite limited. Nevertheless, as will be seen, the beginnings of a descriptive typology can still be developed even at this stage.

The overall perspective taken in this paper is a descriptive-typological one. An inevitable result of adopting this perspective is that some of the key issues will be characterized differently from what is found in formal work, where, in a number of cases, the cross-linguistic properties of templates have been best explored (and such work will, therefore, be frequently cited). An attempt has been made to compensate for this by providing references to sources that offer relevant overviews of formalist approaches wherever possible.

2. *What (if anything) is a "template"*

2.1. OVERVIEW

An initial difficulty in understanding what different "templates" might have in common is that the term has been used informally in linguistics in clearly distinct ways. Here, I delimit the focus to *descriptive or formal schemes employed primarily to characterize constraints on linear realization*, whether in terms of order (as in Table 1), length (as in Table 2), or some combination of the two (see Table 3 in section 2.2). This is the dominant sense of *template* in the linguistics literature at present, though one does find it used to refer to other analytical devices involving "precomposed" linguistic patterns not specifically characterizing constraints on linearization. This is seen, for example, in Van Valin and LaPolla's (1997:73) *constructional templates*, used to characterize entire syntactic structures, or Rappaport Hovav and Levin's (1998:106–11) *event structure templates*, used to characterize verbal semantic patterns.

In this section, I will discuss representative examples of templates involving linearization restrictions across the domains of morphophonology (section 2.2), morphosyntax (section 2.3), and syntax (section 2.4). I will then generalize across these cases to give a cross-domain definition of *template* in section 2.5, and in section 2.6 will briefly address a noteworthy discrepancy where templates have seen greater acceptance in some domains (e.g., morphophonology) than others (e.g., morphosyntax).

It is important to bear in mind that the characterization of a given grammatical pattern as templatic is inextricably tied the linguist's analysis of it. This is, perhaps, most clearly seen in contrasting analyses of the Athabaskan verbal system as exemplified by Kari (1989, 1992) and Rice (2000), wherein the former adheres to the sort of templatic approach schematized in Table 1, while the latter devises an analysis that attempts to avoid the use of templates entirely. Here,

the focus is on proposed templatic *analyses*, rather than on trying to delineate some class of "real" templates, because there is, as yet, no consensus on this issue (see section 2.6).

The overview of template types below makes use of qualifications of the term *template*, describing, for example, a given template as *morphophonological* or *syntactic*. These terms are adopted for expository convenience, rather than reflecting a particular tradition, and the senses of these terms, as used here, should not be expected to automatically carry over into other literature on templates. A good example of this can be found in Vihmann and Croft (2007) who apply the term *template* to patterns which they characterize as *phonological* but which, here, would be characterized as *morphophonological*.

2.2. TEMPLATES IN MORPHOPHONOLOGY

By *morphophonological template*, I refer to templatic analyses where the linear realization of the components of a morphological construction is described in terms of stipulated constraints involving phonological categories. The most famous such templatic constructions are almost certainly "CV skeleton" templates—of the type familiar from Semitic morphology—where the order of consonants and vowels in a given morphological category apparently needs to be stated separately from the order of the consonants and vowels of a particular lexical item (see Broselow (1995:180–182) for an overview in the context of generative phonology). An example of this type of template can be seen in Table 3 which gives data from Sierra Miwok, a Penutian language of California. Smith (1985) offers an early application of a CV-skeleton analysis to Sierra Miwok, based on the descriptions of Broadbent (1964) and Freeland (1951).

PRIMARY	SECOND	THIRD	FOURTH	GLOSS
tuyá:ŋ	*tuyáŋ:*	*tuy:áŋ*	*tuyŋá*	'jump'
polá:ŋ	*poláŋ:*	*pol:áŋ*	*polŋá*	'fall'
ʈopó:n	*ʈopón:*	*ʈop:ón*	*ʈopnó*	'wrap'
huʈé:l	*huʈél:*	*huʈ:él*	*huʈlé*	'roll'
telé:y	*teléy:*	*tel:éy*	*telyé*	'hear'
CVCV:C	CVCVC:	CVC:VC	CVCCV	

Table 3: CV templates in Sierra Miwok (Freeland 1951:94–95)

The data in Table 3 exemplifies the four stem shapes associated with verbs of a particular inflectional class (Freeland's "type I") in Sierra Miwok. The alternations among these stem forms are governed by the suffix (e.g., a tense suffix) that immediately follows the stem (Freeland 1951:96). As indicated in the last row of Table 3, these alternations can be schematized via patterns of consonants and vowels (including indication of length). The forms of the stems across each stem class make use of the same consonant and vowels, in the same relative order respectively, but the lengths of the consonants and vowels change and the positioning of the consonants and vowels with respect to each other can change (as can be seen by contrasting the Fourth stem with the other three stems). Freeland (1951) does not explicitly give the CV patterns indicated in Table 3, though these are easily derived from her description. In the present context, it is noteworthy, that, while the templates illustrated above in section 1 exemplified restrictions involving order (Table 1) *or* length (Table 2), the Sierra Miwok CV template describes restrictions of both types. The two classes of restrictions are not mutually exclusive.

What prompts the use of the label *template* (see, e.g., McCarthy (1981:387)) for a system like the one exemplified in Table 1 is the fact that, unlike what is found in Sierra Miwok, the CV-patterning of a word is generally expected to be derivative of the fixed linear specification of a

morpheme's segments. For example, in an English word like *cat*, the fact that it shows a CVC shape can be straightforwardly treated as an epiphenomenon of fact that it has a segmental specification /kæt/, which simply happens to consist of a consonant followed by a vowel followed by another consonant. Accounting for the less typical pattern seen in Table 1, by contrast, requires an additional analytical device characterizing a stem's linearization restrictions—i.e., a morphophonological template.

Table 2, discussed in section 1, offers another example of a morphophonological template, in that case one involving a restriction on phonological size. Specifically, roots in a particular morphological construction are obligatorily bimoraic, forcing either truncation or lengthening of the lexical form of the root. Comparable phenomena are frequently found in partial reduplication constructions, which have also been given templatic analyses (see, e.g., Hayes and Abad (1989), McCarthy and Prince (1996), and Hendricks (1999:15–29)).

Morphophonological templates have seen much more attention in the formal linguistic literature than any other template type in the context of research on so-called prosodic morphology within generative phonology (see, for example, McCarthy and Prince (1995, 1996) and Downing (2006), among many others), and the insights of this work have even been applied to morphophonological patterns in sign languages (see, e.g., Corina and Sandler 1993:187, Sandler and Lillo-Martin 2006:51–60, 139–143). In the present context, an interesting aspect of this line of work is the fact that, in addition to examining a substantial number of instances of apparent templatic phenomena, it is also associated with a restrictive theory of template form making strong typological predictions, as will be discussed in section 3.1.

A significant feature of the formal literature on morphophonological templates is the fact that they have not only often been accepted as valid analytical devices but have even played a

prominent role in refining phonological theory generally (see, e.g., Urbanczyk (1996:1–20) and Ussishkin (2005:169–173)). Moreover, while some recent formal work has offered non-templatic analyses for what had been treated as morphophonological templates (Hendricks 1999:39–59, Urbanczyk 2006:182, Ussishkin 2005:172–173), at least some of these developments can be cast as following a "positive" analytic progression wherein a better understanding of the cross-linguistic patterns has permitted less stipulative analyses over time (Downing 2006:134) (though see Rose (2003:92) for a contrasting viewpoint partly responding to this trend). Accordingly, this line of research is quite useful in revealing a range of interesting templatic patterns regardless of one's theoretical orientation. As will be discussed in section 2.3, this has not been as much the case in formal work on morphosyntactic templates.

There is also work within generative phonology related to work on prosodic morphology that employs *phonological templates* (see, e.g., Itô (1989) and Crowhurst (1991)) to account for strictly phonological patterns (e.g., metrical footing). Such work is not intended to describe language-specific templates but, rather, proposes a set of universal templates to explain cross-linguistic patterns, making these "templates" rather different from those that are focused on here.

2.3. TEMPLATES IN MORPHOSYNTAX

By *morphosyntactic template*, I refer to templatic analyses where the linear realization of the components of a morphological construction is described in terms of stipulated constraints on elements characterized in terms of morphosyntactic or morphosemantic categories like *agreement* or *tense* affix. Languages analyzed as making use of elaborate morphosyntactic templates are also referred to as having *position class* (see, e.g., Anderson (1992:131), Stump (1993, 2001:138–139)) or *slot-filler* morphology (see, e.g., McDonough (2000a:157–160)).

At least since Simpson and Withgott (1986), it has been common to discuss of an opposition between *layered* morphology (associated with hierarchical structure) and *template* morphology (associated with a "flat" structure) in morphosyntax (see also Stump (2006) for a recent summary overview, Stump (1997) for a more critical appraisal, and Manova and Aronoff (2010) for a relevant survey on principles of affix ordering). Inkelas (1993:560) gives a concise characterization of morphosyntactic templates as cases where "morphemes or morpheme classes are organized into a total linear ordering that has no apparent connection to syntactic, semantic, or even phonological representation".

Two examples of structures that have been taken to exemplify morphosyntactic templates are given in (1) and (2). The example in (1) gives the templatic analysis assigned to an Ahtna (Athabaskan) verb by Kari (1989).[1] The examples in (2) support a templatic analysis offered by Hyman (2003) (see also Good (2005)) of the order of a pair of valence-changing suffixes in Chichewa (Bantu).[2] These two examples are meant to be illustrative of the more complex end of proposed morphosyntactic templates (1) and the less complex end (2).

(1) $na_{\mathbf{10A}}$-$gh_{\mathbf{4A}}$-$i_{\mathbf{3D}}$-$z_{\mathbf{3C}}$-$i_{\mathbf{2}}$-$ɬ_{\mathbf{1}}$-$niik_{\mathbf{ROOT}}$-$\emptyset_{\mathbf{VSF1}}$-$e_{\mathbf{VSF2}}$ → *naghiziɬniige*

THM-QUAL-IPFV.NEG$_1$-S-2s-CLF-feel-IPFV.NEG$_2$-IPFV.NEG$_3$

"you have not yet found a fabric-like object" (Kari 1989:441)

[1] The glossing abbreviations in (1) are as follows: 2s–second person singular (subjects); CLF–classifier; IPFV.NEG – imperfective negative (composed of three formatives); QUAL–qualifier suffix (contributes to verbal meaning); S–inflectional negative suffix with form *s*/*z*; THM–thematic suffix (contributes to verbal meaning). The position class analysis and morphological breakdown in (1) is that of Kari (1989:441), and the interested reader is referred to Kari (1989, 1990) for the details behind the labeling conventions. Glossing is my own, based on Kari (1989, 1990).

[2] The glossing abbreviations used in (2) are as follows: APP–applicative; CAUS–causative; FV–inflectional final vowel; PROG–progressive; numbers refer to noun classes.

(2) a. *Alenjé* *a-ku-líl-**íts**-**il**-a* *mwaná* *ndodo*.

2.hunter 2-PROG-cry-CAUS-APP-FV 1.child 10.sticks

"The hunters are [making [the child cry] with sticks]."

b. *Alenjé* *a-ku-tákás-**its**-**il**-a* *mkází* *mthíko*.

2.hunter 2-PROG-stir-CAUS-APP-FV 1.woman 9.spoon

"The hunters are [making [the woman stir with a spoon]]." (Hyman 2003:248)

The example in (1) gives a morphological analysis of an Ahtna verb wherein it is treated as consisting of nine morphemes, each assigned a specific position class (indicated with a subscript label) in the highly articulated template described in detail in Kari (1989, 1990). This template is derived from the same analytical tradition as that seen in table 1, though it contains many more positions (around thirty) and also adopts a right-to-left numbering convention beginning with the verb root (which is followed by several suffixal positions). What makes the analysis in (1) templatic is the fact that these position classes are treated as basic units of analysis that are, moreover, discovered by examining constraints on morpheme linearization (Kari 1989:434–437) rather than, say, commonalities of syntactic or semantic function.

The data in (2) illustrate a much simpler morphosyntactic template which can be reduced to constraints on the relative order of morphemes when they happen to cooccur. In this case, the morphemes of interest are the Causative and Applicative in Chichewa, each of which increases the valence of a verb. The Causative adds causative semantics to the verb, including the introduction of an agent of the caused action, and the Applicative allows the verb to be realized with a second object argument without the need for adpositional marking. In the examples in (2), the additional object arguments are the instruments *ndodo* 'sticks' and *mthíko* 'spoon'. The

important descriptive generalization illustrated by the data in (2) is that, despite the fact that (2a) and (2b) show different scopal interpretations for causativization with respect to applicativization, each meaning is expressed with the same Causative-Applicative morpheme order. In (2a), applicativization has scope over causativization, giving a reading where the introduced instrument is used by the causer *alenjé* 'hunters', while, in (2b), causativization has scope over applicativization, giving a reading where the instrument is used by the causee *mkází* 'woman'. As discussed in detail in Hyman (2003) what makes this pattern templatic is the fact that the order of the suffixes is apparently fixed by the morphology rather than being determined by some more general principle (see Muysken 1988:270–273 for discussion of a comparable pattern in Quechua).

Morphosyntactic templates have been a widely employed device in descriptive work for decades, especially for North American languages. Some examples, not previously cited, include: Lounsbury (1953:18–20, 45, 71, 73, 89) for Oneida (Iroquoian), Bloomfield (1962:101–111) for Menomini (Algonquian), McLendon (1975:77–78) for Eastern Pomo (Hokan), Kimball (1991:113) for Koasati (Muskogean), Young (2000:17–26) for Navajo (Athabaskan), and, outside of North America, Maganga and Schadeberg (1992:97–98) for Kinyamwezi prefixes (Bantu) and Vajda (2004:44–45) for Ket (Yeniseic). This list is hardly exhaustive. An additional phenomenon that has played an important role in contemporary approaches to morphosyntactic templates are so-called clitic-clusters, elements which, regardless of their overall syntactic placement in a clause, have been treated as having templatic internal structure (Simpson and Withgott 1986, Bonet 1995, Halpern 1995:191–193).

Unlike morphophonological templates (see section 2.2), much of the formal literature on morphosyntactic templates has been oriented toward reanalyzing apparent cases as unrecognized

instances of layered morphology rather than developing new "templatic" formal devices, sometimes by appealing to abstract (and even templatic) morphophonological models (see, e.g., Barrett-Keach 1986, Myers 1987:14–140, McDonough 1990, 2000a, 2000b, Speas 1984, 1987, 1990:247–275, Rose 1995, Rice 2000, Hale 2001). Spencer (2003) offers a review of many of the key issues, and Nordlinger (2010) defends the need for a templatic approach to some morphosyntactic patterns which takes into account arguments made in work like Rice (2000).

2.4. TEMPLATES IN SYNTAX

By *syntactic template*, I refer to templatic analyses where the linear realization of the components of a syntactic construction are described in terms of stipulated constraints on elements characterized in syntactic or semantic terms like *subject phrase* or *pronoun*. The word *template* is not nearly as commonly employed to linearization restrictions in syntax as it is for morphosyntax. Nevertheless, even in cases where the term is not used, one can find syntactic analyses of linearization which are comparable enough to morphosyntactic templates to make them clearly worthy of discussion here.

One example involves the topological fields approach to German syntax (see, for example, Höhle (1986) and van Riemsdijk (2002:146–148)). In Kathol's (2000) formal treatment employing this model, the German clause is treated as being composed of the five positions in Table 4, which are strictly ordered following the linear specification in (3) where "<" should be interpreted as "precedes". The characterizations of the positions in Table 4 are simplified for purposes of presentation here, and some positions (e.g., *mf*) can contain more than one element. The abbreviation labels are not intended to be readily interpretable.

ABBREVIATION	CHARACTERIZATION
vf	first position
cf	second position
mf	middlefield
vc	verb cluster
nf	postverbal field

Table 4: German topological fields (Kathol 2000:78)

(3) *vf* < *cf* < *mf* < *vc* < *nf* (Kathol 2000:79)

A key motivation behind the characterization of the German clause via a series of positions is that clausal patterns in the language do not appear to be straightforwardly analyzable in terms of linear ordering constraints on "natural" syntactic classes like *subject* but, rather, require the use of "unnatural" categories like *either finite verb or complementizer*, which is the case with the *cf* position, as illustrated in the examples in (4), adapted from Kathol (2000:80).[3]

(4) a. [*Die* *Blume*]$_{vf}$ [*sieht*]$_{cf}$ [*Lisa*]$_{mf}$.
the.FEM.ACC flower see.PRS.3s Lisa
"Lisa sees the flower."

b. …[*daß*]$_{cf}$ [*Lisa*]$_{mf}$ [*die* *Blume*]$_{mf}$ [*sieht*]$_{vc}$.
that Lisa the.FEM.ACC flower see.PRS.3s
"…that Lisa sees the flower."

[3] The glossing abbreviations in (4) are as follows: ACC–accusative; FEM–feminine; PRS–present; 3s–third singular. The presentation in (4) is adapted and simplified from that found in Kathol (2000:80). Glossing and translation are my own, and the translation of (4a) ignores pragmatic nuances associated with the object-initial word order.

The sentences in (4) schematize Kathol's (2000) positional analysis of the German clause via subscripts corresponding to the abbreviations in Table 4. In (4a) a finite verb is assigned to the *cf* position, but in (4b) a complementizer is assigned to this position. Furthermore, in (4a) the object is assigned to the *vf* position, but in (4b) it is assigned to an *mf* position. The analysis of the clause into strictly ordered clausal positions which cannot be straightforwardly characterized in more usual syntactic terms like "subjects precede the verb" is what makes it templatic.

While Kathol (2000) does not use the word "template" to characterize his analysis, a comparable sort of syntactic analysis is found in Dik (1997:70–71) (see also Connolly 1983, 1991:50–55), as part of a general model of constituent ordering, and, in this case, *template* is specifically employed. Dahlstrom's (1993, 1995) approach to Fox (Algonquian) clausal syntax also employs the term, as does Awóyalé (1988) (see also Ekundayo and Akinnaso (1983:123–126)) whose "semantic templates", here, would be classified as syntactic templates. The use of the term template in this way can also be found in descriptive work as means to characterize the basic word order patterns of a given constituent type (see, e.g., Blackings and Fabb (2003:259), Enfield (2006:312), Epps (2008:284)).

In addition to syntactic templates like those just discussed that show clear parallels to morphosyntactic templates (see section 2.3), there is a somewhat different phenomenon which has also been given analyses making use of syntactic templates: This is the second-position clitic (see, e.g., Zwicky (1977:18–20), Anderson (1993, 1996, 2000, 2005:108–114), Halpern (1995:13–76)). Second-position clitics have received a wide range of analyses, not all of which are clearly templatic, and the word "template" itself is not regularly applied to even templatic analyses of the phenomenon (though see Revithiadou (2006:80)). Nevertheless, they represent another possible kind of syntactic template.

While they do not use the word *template*, Zec and Inkelas (1990:369) notably analyze aspects of second-position clitics in Serbo-Croatian by means of an explicit prosodic "subcategorization frame" associated with the clitic that specifies it must be preceded by a *phonological* word. Their analysis bears clear similarities to cases of morphophonological templates that are also described in terms of phonological constituents (see section 2.2). In the classificatory system developed here, such a template would be best termed *phonosyntactic* rather than *syntactic*. Such templates do not seem to have been frequently proposed, though there are at least a few other examples (Zec and Inkelas 1990:372–377, Inkelas and Zec 1995:545–546, Good 2003:360).

Work within constructional approaches to syntax may sometimes informally characterize a given syntactic construction in terms that make it appear to be templatic in nature. However, whether or not a template is part of the structure of a given construction can only be determined on the basis of a specific analysis of its patterns of linearization. For example, Kay and Fillmore (1999) refer to a specific English construction as the *What's X doing Y?* construction, suggesting the presence of two open "slots" in a templatic structure. However, they ultimately argue that the construction's syntactic linearization is derivable from more general syntactic properties of English (Kay and Fillmore 1999:30), implying that it is not, in fact, templatic.

2.5. DEFINING *TEMPLATE*

The previous sections surveyed a number of different kinds of templatic analyses of linearization phenomena, grouping them into an informal classification. As noted in section 1, there has not been much work looking at templatic phenomena across grammatical domains. Nor is there a widely adopted general definition of *template*. Furthermore, even though some work is explicitly interested in arriving at a detailed understanding of templates (see, e.g., McCarthy and Prince

(1996) and Simpson and Withgott (1986)), when they are invoked in descriptive work, it is not usually clear when they are used primarily as a descriptive convenience as opposed to a proper analysis. Therefore, while I will attempt to give a kind of "retrospective" definition of the term here, there are clear difficulties involved in defining *template* rigorously. Accordingly, I will do something weaker and give, instead, an informal definition which, I believe, captures the intuitions that have led to the invocation of templates in much of the literature, in particular in cases where they have been a serious matter of investigation.

As discussed in section 2.1, the present survey initially delimited the range of analyses to be covered to those characterizing constraints on linear realization. This dictates, of course, that the definition will somehow involve linear stipulations. However, a difficulty immediately arises: Grammatical analyses constantly invoke constraints on linear realization that are not typically considered "templatic", but no general principle has been proposed to separate non-templatic linear stipulation from templatic linear stipulation. For example, the presence of "linear" minimal sets like *cat*, *tack*, and *act* seemingly requires us to analyze English morphemes as involving some kind of linear stipulation holding among their segments. Nevertheless, they are not described as templates, despite the fact one could imagine a language with sufficiently restricted phonotactics as to render such linear stipulation unnecessary (in a way comparable to Yip's (1989) analysis of Cantonese as a language where specification of the relative order of consonants and vowels in a lexical item is not required). Similarly, there are basic grammatical concepts like *prefix* and *suffix* or *proclitic* and *enclitic* which, by definition, involve linear stipulation of *before* or *after*, but these, too, are not considered to be templatic. Again, such stipulation is not a logical necessity, and cases have been proposed of affixes lacking such

stipulation and whose appearance can be (at least partly) predicted based on other considerations (see, e.g., Noyer 1994, Kim 2010, Paster 2009:34–36).

Clearly, then, labeling something a template requires more than the fact it involves linear stipulation. What seems to be additionally required, if rarely made explicit, is that the linear stipulation is, for some reason, *unexpected*. Thus, the linear stipulation involved in describing the segments in *cat* is not considered templatic because linear stipulation of segments in a lexical item is not considered to be unusual. Similarly, while examples of prefixes and suffixes abound in grammars, so-called mobile affixes (Paster 2009:34–36), analyzed as lacking specification for appearing before or after their stem, and having their placement determined by phonological considerations, are quite rare. They are so rare, in fact, as to be excluded by conventional definitions of a word as (among other things) being composed of elements that must occur in a fixed order (see, e.g., Dixon and Aikhenvald (2002:19)), and it has even been argued that "mobile affixation does not really exist" but is the result of misanalysis (Paster 2009:36). Therefore, prefixes and suffixes are also not generally characterized as templatic, even though they involve linear stipulation, because the nature of their stipulation is considered "normal".

By contrast, highly articulated position class systems (Table 1), length restrictions forcing segmental material to be deleted or added (Table 2), the separation of overall CV-patterning from segmental patterning (Table 3), or clausal structures which cannot be defined in terms of generally accepted phrase structures (Table 4), among many of the other phenomena discussed above, show linear stipulation that is unexpected within the relevant domains, hence the adoption of templatic analyses for them. This insight allows us to arrive at an informal definition of the term *template* as in (5) (see also Good 2003:26, 2007:12–13).

(5) **Template:** An analytical device used to characterize the linear realization of a linguistic constituent whose linear stipulations are unexpected from the point of view of standard approaches to linguistic analysis.

To be clear, the definition in (5) is meant to reflect the term as used in a significant number of cases rather than to serve as the basis on which a detailed investigation might be conducted. Moreover, it leaves open the crucial issues of just what counts as "unexpected" and "standard", areas where there is certainly not complete consensus (see section 2.6). Nevertheless, it suggests some clear directions for coming to a better understand of the typology of templatic phenomena. Among these are: (i) understanding the typology of templates requires the development a rigorous framework for describing linear stipulation in a way that facilitates cross-linguistic and cross-constructional comparison (see section 3.2) and (ii) phenomena classified as both templatic and non-templatic should be described using this framework to allow us to understand better the extent to which a distinction between templatic and non-templatic linear stipulation may be systematic. Adopting such an approach would mean following a similar path to what is found in work like that of Keenan (1976) or Hopper and Thompson (1980) that breaks down other traditional grammatical notions (*subject* and *transitivity*, respectively) which are not obviously definable in rigorous ways into conceptually simpler components so that their cross-linguistic significance can be better understood.

2.6. DISCREPANCIES IN THE ACCEPTANCE OF "TEMPLATES"

As pointed out above (see sections 2.2 and 2.3), the invocation of templates has, on the whole, been treated as less problematic in the morphophonological literature than the morphosyntactic

literature. Moreover, to the extent that one does not find an extensive body of work arguing against the use of templates to analyze syntactic phenomena, this would not appear to be due to the fact that they are simply "accepted". Rather, they have been invoked relatively infrequently and, when they are employed, have not been proposed to be as complex as many morphosyntactic templates (see, e.g., Table 1), which has clearly made countering their use a less significant issue than in morphosyntax.

What might be the reasons for these discrepancies? I am not aware of much work that addresses this issue (though see Good 2003:508–510 for some discussion). However, at least part of the explanation almost certainly lies with the fact that the linearization of linguistic constituents is often understood not to result from logical necessity but, rather, constraints inherent to the use of the auditory-vocal modality in spoken language (see, e.g., Wojdak 2008:7 for recent discussion in the context of a non-templatic analysis of affix ordering). If linearization is thought of as an accidental "by-product" of the form that spoken languages happen to take, then it should not be surprising that work focused on a domain more closely linked to form (morphophonology) should find it more natural to employ a device involving stipulation of linear order than work focused on a domain less closely linked to form (morphosyntax) and that work on the domain under consideration here with the weakest connection to form (syntax) does not have as extensive a literature devoted to "templates" as the other two. Comparable ideas have been expressed in work on sign languages as well. Morphophonological templates have been proposed to account for aspects of linear realization in the visual-gestural modality (see section 2.3), while, at the same time, it has been suggested that the effects of modality should be relatively constrained in sign language syntax (Lillo-Martin 2000:242–244).

It is worth bearing in mind, however, that a full analysis of any language seems unimaginable without some amount of linear stipulation, if only in the specification of the order of segments in lexical items, for example. Therefore, what is at stake is not *whether* language allows linear stipulation but *where* it is allowed. In this sense, work in morphosyntax that has tried to avoid templatic analyses can be well understood as making a claim that, since many aspects of linear ordering in morphosyntax can be analyzed without the need for the sort of elaborated linear stipulation embodied by templates, it is reasonable to assume that this is because morphosyntax, in some sense, "allows" for nothing but the most basic kinds of linear stipulation (e.g., whether an affix is prefixing or suffixing).

In fact, in surveying the literature on "templatic" restrictions across grammatical domains, it is hard not to conclude that the question of whether or not a "template" may be the best way to analyze a given pattern is potentially misleading. The crucial issue is: Given some analytical treatment of a linguistic constituent, which of its linear patterns must be treated as stipulated, and to what extent do those stipulations seem to be in line with stipulations seen in other analyses of comparable phenomena? On this view, one way to read Rice (2000), for example, is not as an argument against the use of *linear stipulation* in any form when analyzing the Athabaskan verb, but, rather, as an argument against the highly elaborated *template* that has typified descriptive work on the family (see, e.g., Rice 2000:395 and also Noyer 1991:199 and Good 2003:104–105 for relevant points).

A key difficulty in generalizing on this insight is that linguistics lacks a framework for characterizing patterns of linearization independent from the factors—e.g., semantic, syntactic, or phonological—taken to condition those patterns. This makes it quite difficult to compare how different analyses "parcel out" predicted patterns of linearization from stipulated ones. To take

one example, Bošković (2001:84) argues for a treatment second-position clitics in Serbo-Croatian (see section 2.4) involving a "filter" which does not allow sentences to surface which do not fulfill a clitic's templatic requirements over one involving phonologically-motivated "movement". While this distinction is of crucial importance within the transformationalist framework he adopts, determining the precise ways in which a "filtering" analysis of predictable versus "templatic" linearity differs from a "movement" one, which is a prerequisite for comparing them in more general typological terms, is not at all obvious.

3. Typologizing templates

3.1. THE PROSODIC MORPHOLOGY HYPOTHESIS

In one grammatical domain—morphophonology (see section 2.2)—a proposal known as the *Prosodic Morphology Hypothesis* (McCarthy and Prince 1995:318, 1996) regarding the possible shapes of templates has received significant interest (see Downing 2006:5–16). It suggests that there is an intricate relationship between prosodic structure and morphophonological templates, specifically claiming that such templates will always be describable in terms of a universal set of prosodic constituents. (See Nespor and Vogel (1986) for a classic reference on prosodic constituency and the works of Bickel, Hildebrandt, and Schiering (2009) and Schiering, Bickel, and Hildebrandt (2010) for recent typologically-oriented discussion.) This would allow, for example, a morphophonological template with the shape of a syllable but not, for example, a single consonant, since the latter is not a prosodic constituent (Hendricks 1999:35–36).

While it was developed in a way quite distinct methodologically than is the norm within work coming out of typology as a subfield, the Prosodic Morphology Hypothesis's claim of a link between prosodic constituency and templates is clearly of typological interest (and

paralleled by ideas developed in Good (2003, 2007)). At the same time, it does not, in and of itself, provide an adequate framework for constructing a rigorous typology of templates (morphophonological or otherwise) because of its methodological stance that combines description and explanation of a given phenomena within a single framework using universal categories (see Dryer (2006:223–224) for relevant discussion). This runs counter to significant ideas within current typological practice both in terms of overall approach (Nichols 2007:231–232) and in the understanding of grammatical categories as language-specific phenomena (see, Dryer (1997), Croft (2001), Haspelmath (2007), Cristofaro (2009)). Of course, the goals of work done in the context of the Prosodic Morphology Hypothesis are quite different from those of contemporary typology. So, this discrepancy is hardly surprising.

3.2. CATEGORIES FOR A GENERAL TYPOLOGY OF TEMPLATES

While there has not been a systematic attempt to typologize templates across grammatical domains, surveying existing cases of phenomena given templatic analyses suggests a number of descriptive dimensions along which templatic constructions can be characterized in general terms, listed in (6). The term *component* in the list below is used informally to refer to the units that a given template is analyzed as consisting of, e.g., a consonant or vowel (see section 2.2) or a position class (see section 2.3), among others.

(6) a. *Order* versus *length*: Templatic restrictions can make reference to component order (as in Tables 1 and 4) or length (as in Table 2) or both (as in Table 3).

b. *Presence of "foundational" component:* Templates involving ordering restrictions sometimes treat one component as forming a base around which other components are organized (e.g., the verb root in example (1)), while other templates are not analyzed with such a component (e.g., the CV templates seen in Table 3).

c. *Hierarchical structure:* While templates are often treated as flat structures (see section 2.3) some analyses have treated templatic components as belonging to template-specific hierarchical structures (see, e.g., the "zones" of Kari (1989), the morphological levels of Inkelas (1993:596–596), or the proposal of a supertype subsuming two topological fields in Kathol (2000:83)).

The dimensions in (6) offer some dimensions of variation relevant to an entire template. In addition, the components of templates have also been analyzed as having different properties, even within a single templatic construction. Some of these are summarized in (7).

(7) a. *Obligatory* or *optional*: Some components of a template may be obligatory, while others may be optional (see Table 1).

b. *Fixed* or *elastic:* A given component may be of fixed size (e.g., one morpheme) or be allowed to be filled by multiple elements (e.g., several morphemes of a particular class) (see Tables 1 and (4b)). (The distinction between *articulated* and *unarticulated* templates in Crowhurst (1991:201–202) is comparable.)

c. *Open* vs. *specific*: A templatic restriction may apply to a class of elements, e.g., all subject prefixes (Table 1) or consonants (Table 3), making the component "open" or be limited to a specific element, e.g., the Causative or Applicative suffixes in (2).

The dimensions of variation given in (6) and (7) are meant to be illustrative of the kinds of properties that would need to be considered in developing a general typology of templatic constructions and are not exhaustive. Nevertheless, they establish what is likely to be a key consideration of any typology: Description of the overall properties of a given template independently from the properties of individual components. This is analogous to, for example, work on the typology of grammatical relations which must consider both the overall set of argument roles in a given clause and the referential properties of individual arguments (Evans 1997:425–427, Bickel 2011).

While it has not yet been made explicit, it should also be clear that the dimensions of variation in (6) and (7) are geared towards understanding the typology of specific templatic constructions, not anything like the "templaticity" of an entire language. Such analysis would be possible, however, if a database describing the range of linearization constructions present in a given set of languages were available allowing one to assess the extent to which the overall

linear stipulation of one grammar compares to that of another, in a way comparable to Bickel, Hildebrandt, and Schiering's (2009:52–56) treatment of cross-linguistic word coherence. Alternatively, one could take an approach wherein a given, relatively small, set of linearization constructions are taken to serve as exemplars of a language's overall templatic patterns, using them as the basis of a whole language typology (along the lines of Nichols and Bickel's (2005) treatment of morphological coding of syntactic relations).

4. Moving forward

The most salient conclusion of this survey is that, while one can see sufficient conceptual overlap among templatic constructions across grammatical domains that it seems worthwhile to investigate their typological properties as a whole, there is still much work to be done before we can fully understand the nature of templatic variation. At present, the best way forward would seem to be to focus on the description and comparison of individual templatic constructions in a way comparable to Bickel's (2010) treatment of clause-linking constructions. There are important difficulties to be overcome in doing this, however. As evidenced by the survey in section 2, for example, templatic analyses have been applied to heterogeneous patterns within morphophonology, morphosyntax, and syntax, making the use of many traditional notions like *morpheme* or *word* inadequate to characterize them. Thus, a template-specific terminology would need to be developed. In addition, the descriptive analyses upon which one would want to build a typology are often relatively schematic, and extensive additional analysis would be required to tease out the range of linearization restrictions that are at play in a potential templatic construction. Caballero's (2010) exceptionally detailed study of the principles of affix ordering principles in the Choguita variety of Rarámuri (Uto-Aztecan) gives a good indication of the work

that can be involved in this regard (see also Muysken 1988). And, of course, the typologist must devise a way to determine when a non-templatic analysis of a pattern may be more valid than an alternative templatic one, which is rarely obvious. Clearly, the level of work required to conduct a rigorous comparison of templatic constructions across multiple domains of grammar would be quite extensive. Nevertheless, it would appear to be of a similar degree as that of recent typological studies of other kinds of constructional patterns described at a relatively fine level of detail (Bickel, Hildebrandt, and Schiering 2009, Bickel 2010), meaning it is likely to be feasible if not yet done.

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