

Annual Workshop on Formal Approaches to Slavic Linguistics

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Michigan Slavic Materials, 53

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The Stony Brook Meeting **2007**

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Michigan Slavic Publications
Ann Arbor 2008

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Library of Congress Cataloging-in-Publication Data

Workshop on Formal Approaches to Slavic Linguistics (16th : 2007 : Stony Brook, N.Y.)

Formal approaches to Slavic linguistics. The Stony Brook meeting 2007 / [editors, Antonenko, Andrei, Bailyn, John F., Bethin, Christina Y]. -- 1st. ed. p. cm. -- (Michigan Slavic materials ; 53)

Added t.p. title: FASL 16, 2007

Revised and edited versions of papers presented at the sixteenth annual meeting of Formal Approaches to Slavic Linguistics, which was held at Stony Brook University, Stony Brook, N.Y. on May 4-6, 2007.

Includes bibliographical references and index.

ISBN 978-0-930042-98-1 (pbk. : alk. paper) 1. Slavic languages--Grammar--Congresses. I. Antonenko, Andrei. II. Bailyn, John F. III. Bethin, Christina Y. (Christina Yurkiw) IV. Title. V. Title: FASL 16, 2007. VI. Title: Stony Brook meeting 2007.

Title: Stony Brook meeting 2007.

PG59.W67 2007

491.8'045--dc22

2008014422

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Preface

The sixteenth annual meeting of Formal Approaches to Slavic Linguistics took place on May 4-6, 2007, at Stony Brook University and featured a Special Session on The Development, Acquisition and Attrition of Slavic Languages in addition to main sessions on formal approaches to Slavic phonology, morphology, syntax, semantics. Invited keynote speakers were David Pesetsky, Maria Polinsky and Jerzy Rubach. We received 81 abstracts, of which 29 were accepted as papers or posters. The meeting offered 3 keynote talks, 23 other paper presentations and 5 poster presentations, of which 26 appear in revised form in this volume. The conference had 75 registered participants from many countries, including Canada, France, Germany, Israel, The Netherlands, Norway, Poland, Russia, Slovenia, Spain, and the United States.

We are grateful for financial support from the following Stony Brook entities: The FAHSS Program (The Provost's Office Fine Arts, Humanities and Social Science initiative), The Office of the Vice Provost for Research, The Graduate School, The Graduate Student Organization, The Office of the Vice President for Research, The Department of Linguistics, The Department of European Languages, Literatures and Cultures. The Humanities Institute at Stony Brook University provided meeting space, the Department of Music provided live music for the reception, and various services of the University provided refreshments, reception space, and other logistical assistance.

Many individuals contributed to the organization and implementation of the conference. Our sincere thanks to the FASL 16 Organizing Committee (Andrei Antonenko, Svitlana Antonyuk, John F. Bailyn, Christina Y. Bethin, Sandra Brennan, Dan Finer, Mark Lindsay, Roksolana Mykhaylyk, Irina Tarabac) who did most of the planning and organizing of the conference. We are particularly indebted to Sandra Brennan for expert coordination of conference logistics and finances, to Andrei Antonenko for technical support with the reviewing process and the publication of this volume, and to Mark Lindsay for the design and maintenance of the FASL 16 website. We also wish to thank faculty and

FASL 16, 68-83
Michigan Slavic Publications
2008

The Syntax and Phonology of Czech Templatic Morphology

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1 Introduction

On the pages below, we provide phonological evidence for the claim that thematic vowels control the scope of the infinitival template in Czech.

Templates are a well-known descriptive category from Semitic grammar (and other systems with non-concatenative morphology). They enforce the association of a given morpho-semantic category with a certain consonantal and/or vocalic volume (which is calculated in terms of the number of vocalic/consonantal items). For example, a Classical Arabic root is made of at least three consonants. So-called sound verbs (or triliterals) such as \sqrt{ktb} 'to write' incarnate as *katab-a* 'he has written' (root-internal vowels carry morphological information). So-called weak verbs (or biliterals), on the other hand, are one consonant short. This is then repaired by either the reduplication of the second consonant (so-called deaf verbs, e.g., \sqrt{md} → *madad-* 'to extend'), or the insertion of a glide (\sqrt{rm} → *ramay-* 'to throw'). The relevant generalization has been formulated (after Arabic grammarians of the 9th century) by McCarthy (1979) as the Template Satisfaction Principle.

Traditionally, templatic structure is thought of as a typological feature of Semitic (or Afro-Asiatic). However, recent work has evidenced the existence of templatic activity in genetically unrelated languages. Cases in point are Portuguese (Brandão de Carvalho 2003), German (Bendjaballah and Haiden 2003), Ndebele (Bantu, Hyman and Inkelas in

press) and Czech. Our study focuses on Czech infinitives which, among other categories in that language, are controlled by a templatic constraint.

Before engaging the discussion, though, a word is in order regarding what the article is not about, and the questions that it does not aim to solve, or even to address. Templatic activity does not appear to be predictable across languages: it is a parametric possibility that languages may or may not make use of. Even though it is a typical feature of Semitic, it is not true that all Semitic languages are clearly templatic. Nor is it true that only Semitic languages can be templatic (see the non-Semitic examples quoted). Also, no other typological features have been found to systematically cluster with templaticity. While this is a possibility, our article is not at the forefront of this type of study and will not contribute anything to the topic.

In the same way, the study of templatic languages thus far has not brought to light any systematic or necessary bond between a given morpho-semantic category and its being templatic: there is no apparent reason why Czech iterative verbs and infinitives are templatic but, say, l-participles are not. The question why only certain categories are templatic is certainly interesting – but just like other work in the field, we will have nothing to say about it. The same holds true for the nature of templatic restrictions: whether two or three morae are minimally or exactly required is not something that can be predicted at our current level of understanding.

Diachronically speaking, Scheer (2003) has argued that templatic vowel length in Czech is independent from what has been traditionally assumed to be the source of modern length: CS and OCS length and intonation, Eastern Slavic stress, metatony and the like. Rather, relevant vowel length is a Czech (or more probably a Western Slavic) "invention". Our article will not contribute anything to this debate either.

What we engage in on the pages below is a presentation of Czech data which show that certain morpho-syntactic categories require a certain amount of vocalic material. If this is empirically true, any analysis must somehow explain how a specific syntactic configuration induces a particular length pattern at PF. This is what the second part of the article is about: we present a phase-based analysis of how morpho-syntactic structure constrains length at PF.

2 Templatic Activity in Czech

Templatic structure in Czech has been studied by Bethin (2003) and Scheer (2001a,b, 2003, 2004a,b). Czech appears to accommodate many templatic categories, among them iteratives, diminutives and comparatives.

Czech has distinctive long and short vowels; the latter count as one vocalic unit, while the former weigh two units. Czech also features syllabic consonants, which count as short vowels. We refer to these units of vocalic measure with the traditional term mora. Note that the use of this term is purely descriptive and pre-theoretical.

For the sake of illustration, let us consider the case of verbs with an iterative meaning.¹ The derivation produces both iterative lengthening (*sad-i-t* – *sáz-e-t* ‘plant’, *skoč-i-t* – *skák-a-t* ‘jump’, changes in vowel quality are irrelevant here) and iterative shortening (*cít-i-t* – *-cít'-ova-t* ‘feel’, *výš-i-t* – *-výš-ova-t* ‘elevate’). What does this depend upon? The critical observation is that iterative lengthening only occurs in classes 3 (thV=e) and 5 (thV=a), while iterative shortening is only found in class 6 (thV=ova).² The thematic element of the lengthening classes weighs one single mora, while the shortening class has a 2-mora thematic element. That is, all iterative derivations conspire to produce a constant weight of 3 μ : short inputs must lengthen when associated to a one-mora thematic element (against long inputs, which show no reaction: *máv-nou-t* → *máv-a-t* ‘wave’), while long inputs must shorten when concatenated to a two-mora item (against short inputs, which show no reaction: *tlač-i-t* → *-tlač-ova-t* ‘press’).³ Note that the templatic restriction “iteratives must weigh exactly three morae” really depends on the iterative character

¹ We use regular Czech spelling throughout the article. Long vowels bear an acute accent or, in the case of *u*, a little circle (“ů”). Forms that begin with a hyphen (such as *-cít'ovat*) indicate that the root does not exist by itself, and that the kind of prefix which may be added (*po-cít'ovat* etc.) is irrelevant for the analysis.

² ThV is a shorthand for thematic vowel. Czech infinitives fall into 6 classes that are defined by the thematic vowel (-t is the infinitive marker): 1 zero (*krás-ø-t* ‘steal’), 2 -nou- (*tisk-nou-t* ‘print’), 3 -e- (*lež-e-t* ‘lie’), 4 -i- (*pros-i-t* ‘beg’), 5 -a- (*děl-a-t* ‘do’), 6 -ova- (*kup-ova-t* ‘buy’). While the input of the iterative derivation may come from any class, its output only produces verbs in the three illustrated, i.e., 3, 5 and 6.

³ This generalization has been established on the basis of a corpus of 228 non-iterative-iterative pairs in Scheer (2004a,b), which features only 19 contravening items.

of the item: non-iteratives can freely weigh more or less than 3 μ (2 μ *dělat* ‘do’, 5 μ *telefonovat* ‘telephone’).

3 Czech Infinitives

Let us now consider infinitives, which must weigh at least 2 μ : infinitives either bear two short vowels (*dělat* ‘do’), a long vowel (*znát* ‘know’) or a short vowel and a syllabic consonant (*trpět* ‘suffer’). Shorter items do not occur.⁴

Like all other lexical items, verbal roots may have underlyingly short or long vowels. In case they become an infinitive and are left unsupported by vocalic material from the thematic vowel (i.e., when they have an athematic incarnation), the short vowel has to lengthen (while the long vowel meets the 2 μ requirement lexically and appears as such). Artificial vowel length may thus be detected by the fact that all forms of a given verb bear a short vowel except the infinitive, which is long. Verbs such as *pít* ‘drink’ and *krást* ‘steal’ illustrate this pattern (1-part *pi-l*, *krad-l*, n/t-part *pi-t*, *krad-en-ý*, deverb. noun *pi-t-í*, *krad-en-í*, inflected forms *pi-j-u*, *krad-u*, imperative *pij*, *krad'*). The 1-participle, then, is a reliable diagnostic for underlying vowel length in roots: given a long infinitive, a long vowel in this category guarantees true vowel length (examples are *pást* – *pás-l* ‘pasture’, *mást* – *mát-l* ‘baffle’, *trást* – *trás-l* ‘shake’), while a short vowel identifies underlyingly short roots.

Let us now define the pool of verbs for which templatic alternations can be observed at all. That is, under what conditions does templatic lengthening apply? A templatic reaction is only encountered when all lexical pieces of the infinitive together weigh 1 μ (*/kras-ø-t/* → *krást* ‘steal’). This situation, though, can only be produced by two configurations: when either the root vowel or the thematic vowel is zero. The former produces the pattern $\sqrt{C\emptyset C-V-t}$ (e.g., */zøn-a-t/* → *znát*, 1-part *zna-l* ‘know’), while the latter identifies as $\sqrt{CVC-\emptyset-t}$ (e.g., */kras-ø-t/* → *krást*, 1-part *kradl* ‘steal’).

As a consequence, if neither the root- nor the thematic vowel is zero, the form is uninteresting for our study. Therefore verb class 6 (thV=ova)

⁴ We know of exactly seven exceptions (out of about 120 items): *pět* ‘sing’, *chvět se* ‘tremble’, *jet* ‘ride’, *zet* ‘be open’, *spět* ‘proceed’, *mocť/moci* ‘can’, *hřmět* ‘roar’. Items longer than 2 μ freely occur: *telefonovat* ‘telephone’ etc. We come back to this issue in §7.

is disqualified altogether (class 2, thV=nu, is discussed in §5): the input that it produces will never weigh 1μ since its thematic element alone is already bigger than that. Our empirical basis, then, is made only of verbs which have either a root-zero or a thematic zero (and in the former case excludes class 6). The number of items that fall into this category is small enough to be presented in full, which we do in Caha and Scheer (2007).

4 Prefixes and Negation

Interestingly, some verbs react in the presence of prefixes and negation. For example, *znát* 'know', whose length is artificial (1-part *znal*), "shortens" when prefixed or negated (actually nothing shortens at all since the vowel *i* is underlyingly short; rather, it fails to lengthen): *po-znat* 'recognize', *ne-znat* 'not know'. If the templatic interpretation is on the right track, this can only mean that the prefix and negation count as part of the template: hence $[po-zna]_{2\mu-t}$, $[ne-zna]_{2\mu-t}$ (where square brackets delineate the templatic domain that is subject to the 2μ constraint).

On the other hand, there are verbs which remain unaffected by either prefixes or negation. *bdít* 'be awake' for instance, whose length is also secondary (1-part *bděl*), "maintains" its long vowel when prefixed or negated: *pro-bdít* 'be awake a certain period', *ne-bdít* 'not be awake'. In this case, the prefix and negation do not contribute to the templatic count. That is, they lie outside the template: $pro-[bdí]_{2\mu-t}$, $ne-[bdí]_{2\mu-t}$. Note that the contrast at hand really depends on a property of the verb: infinitives show identical behavior with all possible prefixes; also, the effect of prefixes and negation always goes hand in hand.

What, then, decides on the templaticity of prefixes and negation? As a matter of fact, the thematic vowel is in control: verbs with thV= \emptyset, i are insensitive to prefixes ($[hřá-\emptyset]_{2\mu-t}$ – $vy-[hřá-\emptyset]_{2\mu-t}$ 'heat', $[bød-í]_{2\mu-t}$ – $ne-[bød-í]_{2\mu-t}$ 'be awake'), while verbs with thV=*a* react ($[zøn-á]_{2\mu-t}$ – $[vy-zøn-a]_{2\mu-t}$ 'know'). In order for this to be demonstrated, we need to get a handle on the morphological structure of what appears as (C)CV-t on the surface. Recall that all candidate verbs must have either a zero root- or a zero thematic vowel. In case of open roots (i.e., which are not closed by a consonant such as *pí- \emptyset -t* 'drink'), the two structures at hand are merged on the surface: both $\sqrt{C\emptyset-V-t}$ and $\sqrt{CV-\emptyset-t}$ appear as CVt ($/d\emptyset-a-t/ \rightarrow dát$ 'give', $/pi-\emptyset-t/ \rightarrow pít$ 'drink'), while $\sqrt{C\emptyset C-V-t}$ and

$\sqrt{CCV-\emptyset-t}$ merge into CCVt ($/zøn-a-t/ \rightarrow znát$ 'know', $/bdi-\emptyset-t/ \rightarrow bdít$ 'be awake').

Two independent diagnostics permit us to properly disambiguate (C)CVt verbs: the past passive participle (ppp) and the present tense forms. The former has two allomorphs (*-n* and *-t*), which are distributed according to whether the root is open or not. That is, the t-allomorph attaches to root vowels (*pí- \emptyset -t* – ppp *pi-t* 'drink') (and also to class 2 verbs: *tiskn-ou-t* – ppp *tiskn-u-t* 'print'), while the n-allomorph is found with closed roots, both thematic (*bød-i-t* – ppp *bd-ě-n* 'wake') and athematic (*krás- \emptyset -t* – ppp *krad-en* 'steal'). This extends to categories that are derived from the ppp: deverbal adjectives (*bd-ě-n-ý*, *krad-e-n-ý*, *vy-pi-t-ý*) and deverbal nouns (*bd-ě-n-í*, *krad-e-n-í*, *pi-t-í*).

Present tense markers are always of the shape -C(V), except for 1st sg. and 3rd pl., where one paradigm has 1st sg. *-u*, 3rd pl. *-ou*, while another shows 1st sg. *-m*, 3rd pl. *-jí*. Depending on the thematic vowel, this produces three conjugations: theme *e* (*-u*, *-eš*, *-e*, *-eme*, *-ete*, *-ou*), theme *a* (*-ám*, *-áš*, *-á*, *-áme*, *-áte*, *-ají*) and theme *i* (*-ím*, *-íš*, *-í*, *-íme*, *-íte*, *-eji/-í*). The expected 1st sg. *-eu*, 3rd pl. *-eou* for theme *e*, however, do not occur: the thematic vowel has been lost. This regularity is known as Jakobson's Law (Halle and Matushansky 2006): when a vowel-initial personal marker attaches to a thematic vowel, the latter is deleted. Jakobson's Law is sensitive to the morphological identity of the candidate for deletion: thematic vowels are lost, but root vowels remain unaffected; instead, a palatal glide appears in the midst of the hiatus. Hence compare *hřát* 'heat' and *řvát* 'roar', which look the same in the infinitive, but produce *hře-j-u* vs. *řv-u* in 1st sg. The uniform infinitival *-á-* thus reveals its morphological identity in the present tense, where it is only deleted when it is thematic (i.e., *hřá- \emptyset -t* vs. *řv-á-t*). In turn, the glide is unmistakable proof that the preceding vowel belongs to the root. Note that its absence is just as indicative. Were the *-á-* in *ptá-t* (*se*) 'ask' radical, the present tense, even though selecting for theme *a*, would be expected to produce **pta-j-ám*, which it does not: *pt-ám* is encountered (hence *pøt-á-t*).

Given these diagnostics, the prediction is that those verbs which are sensitive to prefixes and negation will produce n-participles and never show the glide in present tense, while verbs insensitive to prefixes and negation will take on t-participles and produce a glide in present tense.

We first consider the (C)Cá-t pattern, which should thus be properly

divided into $\sqrt{C\emptyset(C)}\text{-a-t}$ ($z\emptyset n\text{-}\acute{a}\text{-t}$) and $\sqrt{(C)Ca}\text{-}\emptyset\text{-t}$ ($h\acute{r}\acute{a}\text{-}\emptyset\text{-t}$). The record in Caha and Scheer (2007) shows a total of 34 (C)Cá-t verbs (which should exhaust the Czech lexicon), whose distribution according to the two criteria mentioned is indeed truly complementary (we are aware of exactly one counter-example: *hrát* 'play'). Some representative examples are given in (1) below: verbs with a thematic *a* react to the presence of prefixes and negation, while verbs with a thematic zero do not.

(1) disambiguation of (C)Cá-t

a. C \emptyset C-á-t: deverbal adj -n, no glide in present tense

inf	l-part	deverbal adj	present	+ prefix	negation	
znát	znal	po-zn-a-n-ý	zn-ám	po-znat	ne-znat	'know'
cpát	cpal	vy-cp-a-n-ý	cp-u	vy-cpat	ne-cpat	'stuff'
brát	bral	za-br-a-n-ý	ber-u	za-brat	ne-brat	'take'

b. CCá- \emptyset -t: deverbal adj -t, glide in present tense

inf	l-part	deverbal adj	present	+ prefix	negation	
hřát	hřál	vy-hřá-t-ý	hře-j-u	vy-hřát	ne-hřát	'heat'
bát se	bál	?vy-bá-t-ý	bo-j-ím	?vy-bát se	ne-bát se	'fear'
stát	stál	od-stá-t-ý	sto-j-í	od-stát	ne-stát	'stand'
tát	tál	roz-tá-t-ý	ta-j-u	roz-tát	ne-tát	'melt'

Space restrictions do not permit displaying the examples of (C)Cí-t, available in Caha and Scheer (2007), which show the same clean complementary distribution. The *i*-record, however, is not really significant anyway: it splits (C)Cí-t into C \emptyset C-í-t (*bød-í-t*, *pro-bd-ě-n-ý*, *bd-ím* 'be awake') and (C)Cí- \emptyset -t (*bli- \emptyset -t*, *po-bli-t-ý*, *bli-j-u* 'barf') according to the n-/t-participle and the presence vs. absence of the glide in present tense. But both groups are insensitive to prefixes and negation: *pro-bd-ít* and *ne-bd-ít* remain as unaffected as *po-bli-t* and *ne-bli-t*.

This is because, recall, both thematic *i* (*bød-í-t*) and zero (*bli- \emptyset -t*) provoke insensitivity to prefixes and negation. By contrast, the *a*-record, which splits (C)Cá-t into C \emptyset C-á-t (*zøn-á-t* 'know') and (C)Cá- \emptyset -t (*hřá- \emptyset -t* 'heat'), is truly significant: as before, thV= \emptyset produces insensitivity (*vy-hřát*, *ne-hřát*), but thV=*a* makes verbs react (*po-znat*, *ne-znat*).

Let us now recapitulate where we stand. We have considered open roots with thematic zero ((C)CV- \emptyset -t *bli- \emptyset -t*, *hřá- \emptyset -t*), as well as closed

roots with thematic *i* and *a* (and hence a root-zero: C \emptyset C-í-t *bød-í-t*, C \emptyset C-á-t *zøn-á-t*). The remaining logical possibilities are closed roots with a thematic zero (*krás- \emptyset -t* 'steal') and zero-roots with a thematic *e* (C \emptyset C-é-t). Recall that class 6 candidates (thV=*ova*) do not qualify because they produce inputs bigger than 1 μ ; class 2 (th=*nu*) is discussed in §5. Finally, open roots do not occur with a thematic non-zero.

Let us consider the two missing paradigms. As a matter of fact, C \emptyset C-é-t is entirely absent from Czech. This has a plausible historical reason: long *é* developed into long *i*. This process is colloquial for root and affix vowels (*polévka* 'soup', *mal-ého* 'small GENsg' are literary standard, *polívka*, *mal-ýho* is colloquial), but visibly has applied without exception to thematic vowels, where perfectly literary forms are produced (no variation is possible: *bdít* – **bdět*). Thus C \emptyset C-í-t items sometimes have an *e* in the l-participle (*bdít* – *bděl* 'be awake'), but at other times show *i* (*ctít* – *ctil* 'revere'). The latter bear a real (historical) *i*, while the former have a raised (non-historical) *i* in the infinitive, to the effect that C \emptyset C-é-t has been wiped out altogether.

Finally, the *krás- \emptyset -t* 'steal' paradigm has already been illustrated in §3. It has 21 representatives on our count, all of which are perfectly well-behaving according to our diagnostics: their thematic zero leaves verbs unaffected (*vy-krást*, *ne-krást*), the expected n-participles are produced (deverb. adj. *krade-n-ý*), and no glide appears in present tense (1st sg. *krad-u*). The exhaustive record of the paradigm cannot be included here; it is also available in Caha and Scheer (2007).⁵

5 Class 2 -nu- Verbs and Templatic Scope

Let us now consider verb class 2, whose thematic element is *-nu-*. Non-moraic roots such as *h-nou-t* 'move' or *tk-nou-t* 'touch' may appear to fall into the *i*/zero class: their infinitival vowel *ou* (which counts as long in Czech) is the result of templatic lengthening. Like in the other classes, its underlying short form surfaces in l- and t-participles: *h-nu-l*, *tk-nu-l*; (*po*)-*h-nu-t-ý*, (*pro*)-*tk-nu-t-ý*. These verbs are also insensitive to prefixes

⁵ We call the open root mystery a distributional gap which we do not understand: while closed roots may (*pás- \emptyset -t* – *pás-l* 'pasture') or may not (*krás- \emptyset -t* – *krad-l* 'steal') have an underlyingly long root vowel, open roots have only long *á* (*hřá- \emptyset -t* – *hřá-l* 'heat', (C)Cá- \emptyset -t – (C)Ca-l is missing) and short *i* (*pi- \emptyset -t* – *pi-l* 'drink', (C)Cí- \emptyset -t – (C)Cí-l is missing).

(*po-h-nou-t*, *pro-tk-nou-t*). Moraic roots, however, invalidate this analysis: *kop-nou-t* (1-part. *kop-nu-l*) 'kick' (from *kop* 'kick') also shows lengthened *-nou-* even though the root and the short *-nu-* alone would satisfy the 2μ constraint. In a templatic perspective, then, the template must exclude both the prefix and the root: the lengthening is insensitive to either element.⁶

In sum, thus, we submit that a correct description of Czech infinitives includes a morphologically defined domain δ (i.e., a substring of the infinitive) that weighs at least two morae. The content of this domain depends on the thematic element in the way shown under (2) below. In *-nu-* verbs, the thematic element alone is required to satisfy the templatic constraint, while both the thematic vowel and the root need to meet the 2μ restriction in *i/zero* verbs. Finally, the prefix is counted into the templatic domain only in *-a-* verbs.

(2) summary: templatic scope

	theme	root	prefix
thV=u	✓	✗	✗
thV=i/ø	✓	✓	✗
thV=a	✓	✓	✓

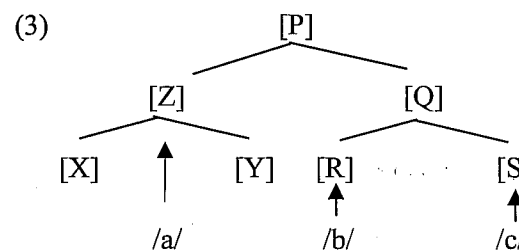
Even though the scope of δ is variable, it is not arbitrary. At least two questions arise: why is the thematic vowel always counted in, and why does the templaticity of prefixes presuppose that the root is templatic too? Answering these two questions amounts to explaining the observations of table (2). In order to do so, below we build on the constituent structure of the verb complex, which is independent of the issue at hand.

6 Assumptions Concerning Spell-out and the Status of the Template

We assume that insertion of phonological material occurs only once the syntactic derivation is completed (McCawley 1968, Halle and Marantz 1993). Following McCawley (1968) and Starke (p.c.), we further assume

⁶ In Czech, the theme *-nu-* derives two major classes of verbs: degree achievements (*chlad-nout* 'get cooler') and semelfactives (*škyl-nout* 'hiccup (once)'). Both classes behave alike as far as the templatic effect is concerned.

that insertion targets both terminal and non-terminal nodes. This is depicted in (3), where letters in [] are names of nodes, and letters in // are phonological material. Vertical arrows represent the spell-out of the structure (3). For instance, /a/ spells out the constituent [Z]. Next, we suppose that insertion is not recursive at any node N: given two lexical spell-out rules /a/ and /b/ that are allowed to target N, only one of them can apply (Kiparsky's 1973 Elsewhere Condition).



We also assume that spell-out involves all types of phonological material, that is segmental, syllabic and templatic information alike. A template, then, is a constraint on the vocalic volume that is spelled out

by a particular node. This means that templates are stored in the lexicon, and their insertion is triggered by a particular node of the syntactic structure. Hyman et al. (in press) and Starke (p.c.) also interpret templates as a phonological weight associated to a morpho-syntactic constituent. Finally, we assume that there is a direct correlation between the order of morphemes and syntactic structure. That is, we follow the idea that words are built by two syntactic processes, Merge and Move, and that the movement involved is (or can be) phrasal (see e.g., Koopman 2005).

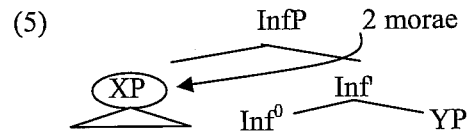
7 The Infinitival Template I: *-a-* Stems

Infinitival markers are suffixal in Czech; hence the verb, which is made of a prefix, a root and a thematic element, must move to a position that c-commands the infinitival marker, i.e., presumably to Spec,InfP. This is depicted in (5), where XP stands for the verb complex to which the infinitival marker attaches. The generalization that the infinitive must have at least two morae can then be expressed as in (4).

For example, the infinitive of *dát* 'give' divides into the root *d-* and the thematic vowel *-a-*; hence the XP in question is *da-*. This item, however, weighs only one mora. In order to meet (4), then, the thematic *-a-* lengthens, and the infinitive *dá-t* is produced. By contrast, if

dát takes on a moraic prefix such as *vy-* 'out', there is no reason for lengthening since Spec,InfP (*vy-d-a-*) already weighs two morae. This is how the contrast between *d-á-t* 'give' and *vy-d-a-t* 'give out' comes about.

(4) Spec,InfP weighs at least two morae



On this count, the monomoraic exceptions that have been mentioned in note 4 can be accommodated as "irregular" items: they are lexically stored as a wholesale spell-out of XP. At least some of the infinitives in question are demonstrably irregular (e.g., *moc-t* 'be able to', 1-participle is *moh-l*). According to the Elsewhere Condition, then, insertion of these items bleeds the bimoraic requirement, which applies to the same node.

But why does the bimoraic requirement target Spec,InfP, rather than XP (whatever the exact label of this projection)? If XP were the actual target (recall that XP contains the prefix, the root and the theme), we would expect the template to be relevant whenever XP occurs, and not just when the XP is dominated by Inf⁰. This, however, is not the case. Rather, the verb displays systematic templatic effects specifically in the infinitive; this is why the template targets Spec,InfP.

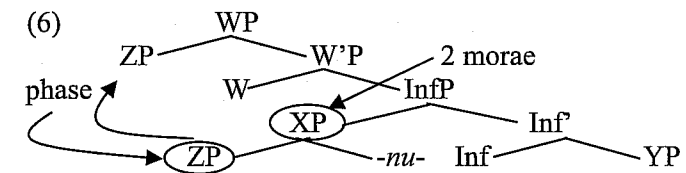
Another question is why the template targets Spec,InfP, rather than InfP itself. We can think of two reasons. If the template were a constraint on the whole InfP, we could expect material contained in the YP under (5) (e.g., adverbs) to help fill the template. That is, infinitives would not lengthen if modified by an adverb, which is not the case. Second, the infinitival ending (Inf⁰) would be expected to contribute to the template. This is not the case either, as shown by the difference between standard literary forms, where Inf⁰ is *-ti* (*-i*), and colloquial forms, where *-t* alone is used. If the template counted Inf⁰ in, a contrastive behavior would be expected according to whether the moraic *-ti* or the non-moraic *-t* is added. But there is no contrast; the colloquial [*píc*]-*t* 'bake' and [*zná*]-*t* 'know' (1-part. *pek-l*, *zna-l*) have the standard literary counterparts [*péc*]-*i* (*[*pec-i*]), [*zná*]-*ti* (*[*zna-ti*]). This

shows that Inf⁰ is invisible to the template, which marshals Spec,InfP, rather than InfP itself.

8 The Infinitival Template II: *-nu-* Stems

Given our analysis thus far, there are two ways to account for the behavior of the *-nu-* class. One solution is to assume that Spec,InfP is occupied only by the theme at spell-out, and that the rest of the verb (i.e., ZP under (6)) has been displaced to a higher position. As a result of the movement, XP now contains only the theme *-nu-*, which then has to satisfy the templatic requirement by itself (and hence lengthens to *-nou-*).

On an alternative view, ZP is a phase, and the content of a phase that has already been interpreted cannot contribute to a moraic constraint at a higher level. We assume that this is piece and parcel of Cyclicity, or more recently Phase Impenetrability. Hence, if ZP is a phase containing the root and the prefix, these will not count as part of the template.



Critical for both solutions is a specific assumption concerning the constituency of the verb: the prefix and the root form a constituent c-commanded by the theme. This is supported by evidence unrelated to the issue at hand. Namely, a prediction is made that the prefix and the root can appear as a constituent without the theme. The nominalization *po-stih* (pref-root) 'sanction', based on the verb *po-stih-nou-t* (pref-root-theme-infinitive) 'affect (negatively)' shows that this is indeed the case.⁷

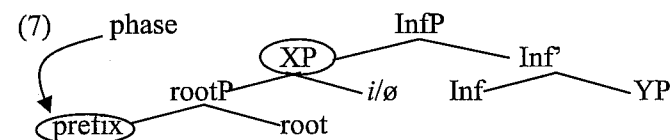
⁷ Two reviewers point out that it is hard to say in which verb class the [pref+root] nominal ends up: the theme is absent, and each such combination can usually get more than one theme. This is what we predict: if the root first takes on the prefix, and if this structure is only later embedded under a theme, it follows that the nominal is not easily recognized as a member of a particular class. The consequence, however, seems to be that there is no way of telling whether the constituency proposed for the *-nu-* class is correct. With *po-stih*, however, we can be quite sure: the aggregation [*po-stih*] combines only with the *-nu-* theme.

We assume that verbs of all classes share this constituency. The special behavior of the *-nu-* class, then, is not due to a particular constituency, but to the fact that the complement of *-nu-* is spelled out in a separate phase.

While we do not show that the movement account is unworkable or faces counter-evidence, we adopt the phase-based solution. One thing pointing in this direction is a conspiracy of two facts: (i) only the *-nu-* class counts solely the thematic element; (ii) only the theme of the *-nu-* class is CV. On the phase-based account, these two facts are unifiable under particular assumptions regarding the phonological status of phases. Namely, Scheer and Ziková (2007) show that only suffixes with floating vowels do not induce phases, and Ziková (in prep.) argues that C-initial suffixes always do. If thematic vowels are floating (which is indeed the case), (i) and (ii) follow. Space restrictions preclude full demonstration of the mechanism at hand which – in case it works out – provides support for the phase-based account since it is hard to see how the movement alternative could relate (i) and (ii) in a non-accidental fashion. In this perspective, then, ZP is turned into a phase by virtue of being selected by the theme *-nu-*. Also, the phase at hand is triggered by a phonological, rather than by a syntactic property of *-nu-* (its C-initial character).

9 The Infinitival Template III: *-i-* and Zero Stems

We are thus left with just *-i-* and *-ø-* stems to be accounted for. In this class the template has scope over the thematic vowel and the root, while prefixes are not counted. Building on our previous account, we propose that prefixes are non-templatic because they have already been spelled out on a previous phase. This is depicted in (7) below. Of course, it would again be possible to move the prefix out of Spec,InfP to a higher position, along the lines that have been laid out above. For the sake of a uniform account, we do not consider this option any further. Again, both the phase- and the movement-based analysis require the prefix to be structurally lower than the root, a position argued for by e.g., Ramchand (2004), Svenonius (2004), and Romanova (2007).



The question now is what makes the prefix a phase of its own. On the one hand, this prefixal phase must be connected to the thematic element: while it occurs with *-i-* and *-ø-* stems, prefixes are not a phase with *-a-* stems (as is shown by the fact that in the latter case they count as part of the template). On the other hand, the fact that prefixes and thematic elements are not structurally adjacent is an obstacle for the view that the latter provoke a phase on the former. Also, we have already seen that thematic vowels do not trigger phases. Note that the movement approach faces a similar problem: the question here is why the prefix evacuates the constituent in Spec,InfP if the theme is *-i-* or *-ø-*.

We therefore submit a third solution: the phase that we observe on the prefix is triggered by the root. Since, however, prefix-phases are triggered only by roots which either have *-i-* or *-ø-* as a thematic element, we propose that roots entertain a selectional relationship with both categories. That is, roots which combine with *-i-* and *-ø-* themes have a lexical property X which (i) is selected by the theme vowels *-i-* and *-ø-*, and (ii) triggers a phase on its complement, i.e., the prefix. This is what we call Phase Transitivity: a morpheme M can trigger a phase immediately below it, or across a structurally adjacent item (Phase Mediator, PM) in case there is a selectional relation between M and PM.

Finally, the scenario that has been laid out provides evidence that phases are different at PF and LF. Indeed, the prefix-phase has a PF, but not an LF effect: the meaning of the pref- $\sqrt{\quad}$ stretch is often idiosyncratic, which means that it is interpreted in the same LF ("conceptual") phase.

10 Cashing out

We can now answer the two questions that were raised in §5. The thematic element, which is the structurally highest item in Spec,InfP, is always templatic because it cannot be caught inside a phase that would make it inaccessible to the template. Even if the XP in (7) were a PF phase, it would not withdraw the thematic vowel from the scope of the template since the template is also introduced at XP, i.e., within the same phase. Second, the root has to be templatic if the prefix is. Indeed, if the

root did not count as part of the template, it would have to be excluded from its scope by being in a separate phase. In such a case, however, the prefix would be excluded as well because the root and the prefix reside in the same constituent.

11 Conclusions

We have proposed that templates are lexical items which are introduced at particular (non-terminal) nodes during the spell-out procedure. This is relevant for the general architecture because in this type of analysis, were it to be generalized, the mapping from syntax to phonology reduces to lexical access. There is no need for readjustment rules of the kind that are used in Distributed Morphology which operate in a special (morphological) module.

This analysis has a number of consequences, two of which we mention here. It supposes that the internal structure of the verb is [[[prefix] root] theme], a conclusion reached independently elsewhere (see the references quoted).⁸ Also, we have proposed that the variable scope of the template is due to phases that occur within the verb. If this is right, there is evidence that (i) LF and PF phases are independent (see Marušič 2005 along similar lines), that (ii) PF phases are piece-driven, rather than node-driven, and that (iii) they may be transitive in the sense of §9. Piece-driven phases are at variance with currently entertained node-driven spell-out where only certain rigidly defined nodes are phase heads (vP, CP, perhaps DP). That is, PF spell-out is triggered by a lexical property of features when these are parsed during spell-out.

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