

Frank Y. Gladney
University of Illinois at Urbana-Champaign

Slavic Morphology

Introduction. Slavic speakers are able to communicate because they share an inventory of sound-meaning pairings, or morphemes—a lexicon. The strings of meaningful sound which they exchange (sentences) are too long and various to be contained in the lexicon, so they need rules for combining morphemes into sentences—syntax. Occurring in sentences, morphemes assume various shapes, and rather than have all these shapes listed in the lexicon, some of them are described as the results of sound change—phonology. A few decades ago lexicon, syntax, and phonology were thought to suffice for describing a language. Syntax arranges the lexical items in sentences and phonology gives their pronunciation. Morphology? Word forms in Slavic are largely made up of morphemes, so in that sense Slavic, unlike Chinese, has morphology. It does not necessarily follow that Slavic has a separate grammar component called morphology. It is possible the facts of morphology can be accounted for with (sublexical) syntax and phonology. The facts in question include derivation, the formation of words,¹ and inflection, their formal alteration as governed by the syntactic features of their sentence environment. Although it may seem reasonable to claim that words must be formed before they can be inflected—in most descriptions of Slavic languages, *Stammbildungslehre* (*formation des mots, slovoobrazovanie*) is treated before *Formenlehre* (*flexion des mots, slovoizmenenie*)—this selective survey of Slavic morphology will begin with inflection, for the reason that, first, it lies closer to the surface and, second, much that is regarded as word- (or stem-) formation is dependent on inflection. A few preliminary matters are addressed first.

¹ “Word” refers a set of inflected word forms minus the inflectional endings, i.e., a stem. A word (stem) may comprise more than one morpheme. “Word-formation” is to be preferred over “derivation” as it is a more transparent term. But in their derivative forms, “derivational(ly)” is handier than “word-formationally”. The two terms are interchangeable,

A minimal grammar. For describing Slavic sentences perhaps it is enough to have lexicon and syntax. We could categorize the lexical items as N(ouns), A(djectives), and V(erbs) and have the syntax include a rule, S(entence) \rightarrow N V A N. The lexicon could be accessed with the lexical rules $N \rightarrow \textit{\textacute{c}lov\acute{e}ka}$, $V \rightarrow \textit{s\textacute{t}vori}$, $A \rightarrow \textit{milosr\textacute{d}yi}$, and $N \rightarrow \textit{bog\textacute{z}}$, thus generating a sentence meaning ‘Man was created by a merciful God’.² A grammar like this would have no morphology component and no phonology component.

But a lexicon that paired the meaning ‘God’ with the string *bogz* would have to pair it also with *boga*, *bogu*, *bozě*, *bogomь*, *bože*, *bozi*, *bogy*, and the other forms of this noun. We need to distinguish between the grammatical sentence just cited and ungrammatical sentences like **člověka sřtvori milosřdyi bozě*. Assuming that lexical rules are context-free, this could be done as follows. Each item in the lexicon has syntactic features associated with it: *bogz* is [NOM, SG], *boga* is [GEN, SG], *bozě* is [LOC, SG], and so on. The predicate phrase *člověka sřtvori* is specified as requiring [NOM] and [SG] in the head of its sister constituent, the subject of the sentence. When this requirement is met as well as others, the sentence passes muster. When it isn’t, for example when the lexical rule $N \rightarrow \textit{bozě}$ introduces a word in the subject position with the feature [LOC], the sentence is rejected.³ Nothing says a description of a Slavic language along these lines would not work. Nevertheless, if we want the lexicon to contain a single noun for ‘God’, not a dozen or so partially similar nouns, the grammar must somehow deal with the facts of inflection.

There is a way of dealing with them that rejects my opening assumption, namely that lexical entries pair sound and meaning. It has been proposed that, whereas the individual forms of a word, such as *bogz*, *boga*, etc., consist of phonemes, i.e., bundles of phonetic feature specifications, the lexical representation of the word does not, is completely abstract. This proposal seems to be motivated by the aim of having the grammar accommodate the facts of suppletion. Suppletion is a central issue, and how we deal with it is crucial for our grammar.

Suppletion. Suppletion is the situation that arises when a word is defective, i.e.,

² Unlabeled forms are Old Church Slavonic. “Early Slavic” here is short for Late Common Slavic. Unlabeled forms with accented vowels are Russian.

³ This approach is presented in Radford 1997, ch. 5.

lacks the forms called for in certain sentence environments, and the speaker chooses a different word. Speakers make substitutions of this sort with varying degrees of automaticity. For English speakers there is complete automaticity in the use of *went* in place of **goed* and nearly as complete in saying *being able* instead of **canning*. There is less in switching from native to borrowed words in attributive constructions, e.g., *hand signals* ~ *manual signals*, *dog behavior* ~ *canine behavior*, **dog distemper* ~ *canine distemper*. Speakers of early Slavic never used the adjective /zъl/ ‘evil, bad’ with the comparative suffix; they regularly substituted /gor/ ‘bitter’— *gorъbi*. The fading of the ‘bitter’ sense of /gor/ in this context, leaving a more general negative sense, fostered, and was fostered by, the paradigmatic relationship of the two adjectives. But a paradigmatic relationship between two morphemes does not make them the same morpheme. Morphemes pair phonemes and meanings. The phonemes of a morpheme are abstracted from the phonemes of its individual occurrences (allomorphs). Conversely, the allomorphs are derived from the morpheme by sound changes (described by phonological rules). In the case of the noun meaning ‘God’, its lexical representation consists of the phonemes /b/, /o/, and whatever can be abstracted from the following segments in the inflected forms. But from *zъbъ* and *gorъbi* no shared phonemes can be abstracted for a lexical item meaning ‘evil, bad’. As long as we hold that the lexicon pairs sound and meaning, we cannot posit a lexical item meaning ‘evil, bad’. Suppletive words fall outside the scope of morphology because they are phonologically unrelated and fall outside the scope of phonology.⁴

There is also a concrete way of dealing with suppletion that should be mentioned.

⁴ Attempts to accommodate suppletion in the morphology component of the grammar have been various, but they all reject the assumption that the lexicon pairs sound and meaning. Stratificational Grammar (Lamb 1964) proposes “strata”, which are related to one another by realization rules. At the lexemic stratum a sentence may contain the “lexon”^L/go/, which does not consist of phonemes. At the morphemic stratum it is realized (in a past-tense environment) as the “morphon”^M/wend/, which does. These proposals are thoroughly rebutted by Postal (1968:56), invoking what he calls the Naturalness Condition, which is that the relation between phonological (lexical) representations and phonetic representations is a natural one, both being stated in phonological features. Postal’s Naturalness Condition blocks also more recent proposals to empty lexical entries of phonetic content. Halle and Marantz (1993) propose an additional level of representation between Surface Structure and Phonological Form which they call Morphological Structure. At this level “vocabulary insertion” takes place, supplying “terminal elements”, up to this point phonemeless, with phonological features. Similarly, AG80 (123) contrasts the word form (*slovoforma*), which is “linear”, with the word (*slovo*), which is “nonlinear”. For example, the noun forms *reběnok*, *reběnka*, *reběnku* ‘child’ and *deti*, *detej*, *detjam* ‘children’ consist of linear sequences of phonemes, but the noun which comprises these noun forms is an abstract unit which doesn’t.

Instead of a phonetically empty /.../ lexical entry for ‘evil, bad’ one could propose /zʲlgor/. A Siamese-twin lexical entry like this requires the deletion of the first three phonemes in some sentence environments and the last three in others.⁵ However, the deletion of phoneme strings from the sentence once lexical insertion has introduced them is not countenanced by the phonology being assumed here.

Suppletion aside, there is another concrete way of accounting for the inflected forms of a word. The forms of the noun ‘God’ being *bogъ, boga, bo 3ě, bogu, bogomъ, bože, bo 3i, bogy, bogъ, bo 3ěxъ, bogomъ, bogy, boga, bogu, bogoma*, one could enter the initial /bo/ that is common to all the forms in the lexicon as the noun ‘God’. The inflectional morphology would then have the task of expanding /bo/ by /gъ/ in [NOM SG] environments, by /ga/ in [GEN SG] environments, by /3ě/⁶ in [LOC SG] environments, by /gu/ in [DAT, SG] environments, and so on. The noun ‘spirit’ has the forms *duxъ, duxa, dusě, duxu, duxomъ, duše, dusi, duxy, duxъ, dusěxъ, duxomъ, duxy, duxa, duxu, duxoma*. Therefore one could enter /du/ as the noun ‘spirit’, and for this noun the morphology would append /xъ/ in [NOM SG] environments, /xa/ in [GEN SG] environments, /sě/ in [LOC SG] environments, /xu/ in [DAT, SG] environments, and so on.⁷ Handling inflection in this way calls for an extremely complex set of morphological rules. We could simplify it by shortening the strings being appended by one segment, namely, to the -ъ, -a, -ě, -u, -omъ, -e, -i, -y, -ъ, -ěxъ, -omъ, -y, -a, u, -oma shared by the two nouns. This simplification results in ‘God’ and ‘spirit’ instead of being just /bo/ and /du/ having stem allomorphs /bog/ ~ /bo3/ ~ /bož/ and /dux/ ~ /dus/ ~ /duš/. Were all these allomorphs entered in the lexicon we would have suppletion again. But they need not be, because /bog/, /bo3/, and /bož/ appear to be phonologically related, and also /dux/, /dus/, and /duš/, and from each set of allomorphs we should be able to abstract a single lexical

⁵ I refer here to Anderson’s (1982:593) “complex lexical entry” which he more recently (1992:133) calls a “lexical stem set”. It is designed to handle the alternation *think ~ thought*, which he considers suppletive. For this verb he posits the Siamese-twin lexical entry /θinkθot/. When it occurs in a [+PAST] sentence environment, only the last three phonemes of the entry are “actually transmitted to the rules of inflection”, implying that the first four phonemes get somehow deleted.

⁶ The traditional symbol “ě” represents a -back +low vowel, i.e., /æ/.

⁷ This is Zaliznjak’s (1977:90–135) way of describing the inflection of Russian verbs without dealing with morphophonemics, as noted in Gladney 1994:307–08.

representation.⁸ If so, the phonology component of the grammar will allow us to avoid this complication of the morphology component (assuming there is one).

Phonology. The phonology component of the grammar comprises rules which describe sound changes. They state that a bundle of phonological features (A) becomes a slightly different bundle of phonological features (B) in some environment (C), where “slightly” alludes to the limits to possible sound changes established by almost two centuries of linguistic research. The variable here is C: whether it must also be phonological (a bundle of phonological features) or may be partly or completely grammatical. Historical-comparative study of languages is ever in search of the phonological C, accepting a grammatical C only when that search fails. Synchronic research into sound change, not wishing to reinvent the wheel, utilizes the results of historical-comparative research as regards $A \rightarrow B$ and likewise prefers a phonological to a grammatical C. Maximizing the phonological and minimizing the grammatical in C often increases the number of steps in $A \rightarrow B$ and hence the remoteness of A from the observable surface. For example, a synchronic account of voc. *bože* and loc. sg. *božě* which sought to explain why a front vowel conditions the shift of stem-final /g/ to -anterior /ž/ in the vocative but to +anterior /3/ in the locative singular might formulate C in terms of different grammatical features. Or it could employ different underlying representations for the endings, necessitating a longer phonological derivation. I incline to the latter, but phonology is not our main concern here.

Inflection. Some linguists view inflection as the morphophonemic alteration of stems, thus subsuming inflection under phonology. This may be warranted in cases like

⁸ These alternations confront us with Hockett’s (1961:30) trilemma, or antilogism—three assertions the acceptance of any two of which entails rejection of the third. He illustrates it with the stems of *knife* and *knives*, but /bog/, /bo3/, and /bož/ serve just as well. The trilemma is: (1) /bog/, /bo3/, and /bož/ are instances of the same morpheme; (2) /g/, /3/, and /ž/ represent different phonemes; and (3) morphemes consist of phonemes. Regarding (1), the morphemic identity of /bog/, /bo3/, and /bož/ I regard as self-evident. Calling them allomorphs of the same morpheme, so that it is allomorphs that consist of phonemes, gains us nothing, because then, however we term them, we have three items, /bog/, /bo3/, and /bož/, which supplete one another in complementary environments. Regarding (3), if we observe Postal’s Naturalness Condition we cannot recognize a “morphophoneme” {G}, realized sometimes as /g/, sometimes as /3/, and sometimes as /ž/ with which ‘God’ may be represented as {boG}, because there are no phonological features which differentiate {G} from /g/, from /3/, and from /ž/. So if we accept the morphemic identity of /bog/, /bo3/, and /bož/ and also bundles of phonological features as the constituents of morphemes, we must reject the premise that /bog/, /bo3/, and /bož/ are lexically distinct. The stem-final consonant that occurs in nom. sg. /bog/ must underlyingly be the same as that which occurs in loc. sg. /bo3/ and voc. /bož/, presumably /g/.

/tuk/, the past-tense form of /teik/, and Ger. /fe:ter/, the plural form of /fa:ter/: /teik/ and /fa:ter/ are morphophonemically altered in the environment of the [+PAST] and [+PLURAL] specifications of the categories under which they appear. But representing these syntactic features as morphemes and these forms as concatenations of morphemes, thus [_V/teik/[PAST]] and [_N/fa:ter/[PLURAL]], is a dubious step. It necessitates first marking the stems for the observed sound changes in the environment of the affixed morphemes and then deleting the latter. Besides, [PAST] and [PLURAL] having no phonetic substance do not qualify as morphemes.

The situation is different where inflection involves additional phonemes being appended to the stem, for example, when /bog/ in an [INSTR, -PLURAL] sentence environment is extended /bogomь/.⁹ It is not clear how /bogomь/ would be described as a morphophonemic alteration of lexical /bog/. Would it be altered from left to right, first to /bogo/, then to /bogom/, then to /bogomь/? Or from right to left: /bog/ → /bogь/ → /bogmь/ → /bogomь/? If on the other hand this is to happen in one step, /bog/ → /bogomь/, it is tantamount to recognizing /omь/ as a morpheme, an ending (E). As a morpheme, /omь/ would be introduced into the sentence by a lexical rule applying to a category symbol, thus E → /omь/.¹⁰

Before E can be lexicalized, it must be present in the sentence. Let us first consider the possibility that E is introduced into the sentence by a phrase-structure rule, i.e., that the supralexic rule NP → N is simply followed by the sublexical rule N → N E, thus subsuming inflection under syntax. Two of the features which govern the

⁹ Halle (1994:34) views number and case as morphemes, and this necessitates a rule which fuses them into a single ending. As a syntactic feature plurality can be a binary [±PLUR], but if it is to be a morpheme, a sentence constituent, then it is a matter of choosing the morpheme [SING] or the morpheme [PLUR].

¹⁰ I do not think morphemes appear in the sentence by being “spelled out”; they are spelled out already in the lexicon and appear in the sentence by lexical insertion. Rappaport (2000) sees it differently. He writes that “lexical items are inserted in syntactic structure with grammatical features corresponding to inflectional properties, but without phonological expression of these features” (p. 5). “Phonological expression” is subsequently provided by spell-out rules operating at the stage of “inflectional morphology”. This appears to be yet another effort to accommodate suppletion, e.g., to account for *on* ‘he’, *ho* ‘him’, and *jej* ‘it’ in Czech with the same combination of “lexical insertions” (which don’t introduce sound-meaning pairings), readjustment rules, and spell-out rules as account for stem-ending structures like interrogative *koho* ‘whom’ and relative *kteřeho* ‘whom’. Rappaport continues: “We will simply assume that the rewrite rule introducing {k-} adds an inherent stem feature ‘pron. decl.’, corresponding to the traditional concept of ‘pronominal declension’” (p. 8). Further: “The feature cluster ‘D, wh, rel’ undergoes a spellout rule to take on the phonological form {kter-}, which is further associated with the declension class feature ‘adj. decl.’” (p. 9). But if declension-class features are inherent, i.e., lexical, they cannot be supplied by rewrite rules.

introduction of noun endings are syntactic: number, which is assigned to NP by the phrase-structure rules, and case, which is assigned by a government transformation. If it were just a matter of these two features, a phrase-structure rule $N \rightarrow NE$ might work. The number and case features assigned to an NP could be inherited by N and by E independently of the lexicalization of the N. This would make Slavic semiagglutinative. Number and case would not, as in Turkish, receive separate expressions, but their fused expression would be independent of the noun which they accompanied. What stands in the way of this is Declension Class.

Declension class. Declension class is a feature for which nouns are categorized in the lexicon. Declension-class features make their appearance in the sentence only with the lexicalization of N. If, at the point in the derivation where N is lexicalized E is already a separate constituent, e.g., [_N [_N/bog/] E], it is not clear how E would acquire the declension-class feature needed for its lexicalization. An agreement rule which assigns the declension-class feature of a noun to the ending which follows it cannot be seriously considered.¹¹

Subcategorizing N is not the answer. For dealing with the gender of nouns, a lexical feature which is syntactically relevant in adjective-noun and subject-predicate agreement, Anderson (1982:592) proposes that the morphosyntactic representation of N be subcategorized as [MASC], [FEM], or [NEUT]. But gender is a feature for which nouns are specified in the lexicon (in the case of inanimate nouns, arbitrarily). Their lexical insertion under N will be greatly complicated if the N at which they are inserted is already specified for gender. And if subcategorizing N as N_{MASC} , N_{FEM} , and N_{NEUT} , is a bad idea, attempting to handle declension class by a further subcategorization for declension class is even worse.

Themes. Perhaps nouns in Slavic can be inflected without reference to declension class. This possibility depends in part on how word forms are segmented. The phrase ‘those good women’ is *oněxъ dobryxъ ženaxъ* in the locative, *oněmъ dobrymъ ženamъ* in the dative, and *oněmi dobrymi ženami* in the instrumental. An analysis of these forms allows us to isolate the case-number endings /xъ/, /mъ/, and /mi/, which endings occur also with /gost/ ‘guest’: *gostъxъ*, *gostъmъ*, *gostъmi*. The vowel that separates root from ending in these forms is known as the theme, and the root-theme

combination is metonymically also called the theme. It is according to their theme vowels that nouns in Slavic are traditionally categorized. Thus /žen/ is assigned to Declension Class A and /gost/ to Declension Class I because in the cited forms that vowel is /a/ and /ɤ/ respectively. A comparison of instr. sg. *gost-b-mɤ* with instr. sg. *bog-o-mɤ* and instr. sg. *syn-ɔ-mɤ* allows us to assign /bog/ to Declension Class O and /syn/ ‘son’ to Declension Class U. Now if these nouns select the same case endings regardless of their declension class, then declension class is no argument against the sublexical phrase-structure rule $N \rightarrow NE$. The E can be lexicalized regardless of the thematic class of the N, and all that would be needed is thematization rules that intercalate the theme vowel called for by a given noun (see below).

Many of the terminations of the nouns of the various Slavic declension classes admit a theme-ending analysis. In nom. sg. *žena*, *bogɔ*, *synɔ*, and *gostɔ* we could posit an obstruent ending and a rule deleting the obstruent word-finally (after it has conditioned the raising of thematic /o/ in *bogɔ*). In acc. pl. *ženy* and *mɔ ɔžɛ* we could analyze the terminations as /a-ns/ and /o-ns/ respectively and relate the surface difference to the nonpalatal/palatal contrast in the stem-final consonants (in /a-ns/ after the nonpalatal /n/ of /žen/, /a/ monophthongizes with /n/, raises, and denasalizes, while in /o-ns/ after the palatal /ž/ of /mɔ ɔž/, /o/ fronts to /e/ and monophthongizes with /n/). In dat. sg. *ženě* and *bogu* we could factor out a shared ending /i/, which is preceded by the contrasting themes /a/ and /o/. Meillet (1934:407), however, observes that the monophthongization of /o-i/ to /u/ has no independent support. These sound changes, borrowed from historical phonology, are plausible, at least in their $A \rightarrow B$ portion. But when it comes to instr. sg. *ženojo ɔ* and *bogomɤ*, I see no possibility of abstracting a common lexical representation from /omɤ/ and /ojo ɔ/. The only way this pair of endings could be related would be via some totally abstract /.../, an approach I reject because it violates the Naturalness Condition.¹² I therefore conclude that for the description of nominal inflection in Slavic we cannot dispense with declension class and that therefore E cannot be introduced into the sentence by the sublexical phrase-structure rule $N \rightarrow NE$. This conclusion is not surprising. It has long been assumed that syntax deals with word

¹² Mohanan 1995 also represents morphemes in ways that cannot be bridged by phonological rules. His morphemes include {GO} and {EN}, but the “formatives” to which they correspond may be phonologically unrelated, as when {GO ED} ends up as /went/ and {KISS EN} as /kisd/.

categories like N, A, and V and their projections, not with sublexical relations between words and their endings.¹³ There remains the question, addressed below, of how the category E is introduced into the sentence.

Declension classes. The constraint against totally abstract endings makes nominal declension classes unavoidable, but we should not constrain the phonology so tightly that declension classes proliferate. In the paradigms of DC-A nouns and DC-O nouns the nonpalatal/palatal contrast in stem-final consonants conditions a number of surface differences in the terminations, e.g., acc. pl. *člověky* / *mɔ ˌʒɛ*, loc. pl. *člověcěxъ* / *mɔ ˌʒixъ*, gen. sg. *ženy* / *dušɛ*, dat. sg. *ženě* / *duši*. In each case, a more abstract representation of the theme-ending sequence and a longer phonological derivation enables us to posit a single underlying representation. Setting up “hard” declension classes for /člověk/ and /žen/ and “soft” declension classes for /mɔ ˌʒ/ and /duš/ is not called for. A noun’s membership in the “soft” classes is phonologically predictable; moreover the “soft” endings can be related phonologically to the “hard” ones, perhaps with some morphological conditioning in the phonological rules. Since the stem-ending match is phonologically conditioned on both sides, it pertains to phonology.

The issue of hard declension vs. soft declension comes up also in Czech, which in addition to the alternations like dat. sg. *ženě* / *duši* inherited from Proto-Slavic has younger alternations like nom. sg. *žena* / *duše* resulting from Old Czech umlaut (*přehláska*). The Czech situation is complicated by the fact that the palatalized dental continuants, which conditioned this alternation, lost their palatalization, rendering forms like nom. sg. *saze* ‘soot’ opaque for *přehláska*. A slightly more abstract representation in

¹³ It should be clear that I do not regard inflectional endings as the result of “prephonological rules carried out by an autonomous morphological spelling component” (Beard 1995:77) or subscribe to that author’s Separation Hypothesis, which denies my opening assumption. Nor do I agree with Beard that “the animate Accusative in Slavic languages can be adequately explained only within [a Separationist] framework [because ... models which rely on lexically listed inflectional morphemes can only posit synonymous [sic; homonymous?] desinences [...]]” (p. 80). My model relies on lexically listed inflectional morphemes, but I do not posit synonymous (or homonymous) desinences in, say, *Ja vižu brata* ‘I see my brother’ and *Ja bojus’ brata* ‘I fear my brother’. A single desinence, [-PLUR, GEN, DC-o] /a/, occurs in both sentences. Beard asks, “Why is there no special affix, Declension Class, or other morphological marking for animacy?” (p. 68). His Gender-Animacy Hypothesis, he says, explains this lack with the claim that “there is no category of animacy for such an affix to mark” (p. 70) One could as well argue that there is no category of verbal aspect in Slavic because there is no special affix, Conjugation Class, or other morphological marking for [±PERFECTIVE].

such cases, i.e., /saz'+a/, obviates the necessity for a “soft” declension class.¹⁴

The declension class of a noun is a function of the declension class of the endings it selects: /bog/ is a DC-O noun because it selects DC-O endings, /žen/ is a DC-A noun because it selects DC-A endings, and /gost/ is a DC-I noun because it selects DC-I endings. But Slavic has more declension classes of endings than it has of nouns. In addition to the three declension classes just named, there is also Declension Class U. DC-U endings include gen. sg. /u/, loc. sg. /u/, dat. sg. /ovi/, instr. sg. /ъмь/, nom pl. /ove/, gen. pl. /ovъ/, loc. pl. /охъ/, and instr. pl. /ъми/. There is no noun in Slavic that needs to be categorized as DC-U, because those which might on historical grounds be so categorized select DC-O endings as often as they do DC-U endings. However, DC-U endings have played an important role in the development of the modern Slavic languages, being assigned a variety of grammatical roles. In Polish, for example, the DC-U nom. pl. /ove/ is a distinctive male-personal ending, occurring in *panowie* ‘masters’, *ojcowie* ‘fathers’, etc. In addition to DC-U endings, which alternate with DC-O endings, there is a smaller set of endings (historically, the Consonantal Declension Class), which alternate with DC-I endings.

These additional endings raise a question for the description of nominal inflection: how do we account for a noun of one declension class selecting an ending of a different declension class? One common solution is to assign nouns with this mixed ending selectivity to a new declension class.¹⁵ This has the consequence of increasing the number of endings in the lexicon, as the endings of this new declension class which do not differ from the corresponding endings of an existing declension class are entered in the lexicon as grammatical homonyms differing only in declension class. In Czech, for example, /pa:n/ ‘master’ is assigned to an Animate Masculine declension class and /hrad/ ‘castle’ to an Inanimate Masculine declension class. This accounts for the contrasting endings in the genitive singular (*pána / hradu*), the locative singular (*pánu / hradě*), and nominative plural (*pani / hrady*), but at the cost of entering ten additional endings in the lexicon. Recognizing case endings as lexical items makes it desirable to limit their number in the lexicon. Rather than recognize a new declension class when a DC-O noun

¹⁴ These issues are discussed more fully in Gladney 1983b.

¹⁵ Thus the Polish Academy Grammar (226–263) and the Czech *Mluvnice Češtiny* (285–345).

selects several DC-U endings, we can view it as a switch in declension class on the part of the noun. Take for example the DC-O gen. sg. ending /a/ and the DC-U gen. sg. ending /u/. If, as regularly happens in Czech (less regularly in Polish), an inanimate DC-O noun selects the DC-U genitive singular ending /u/, we can regard this as its recategorization as a DC-U noun in that grammatical environment. The segmentation rule (next paragraph) that creates E assigns to it the DC-U feature together with [-PLUR] and [GEN], and E being so specified undergoes E → /u/ lexicalization.

Ending segmentation. Peškovskij (1956:16) defines form in a word as “that special property on the strength of which it splits in sound and in meaning into a stem and a formal part”. I propose to formalize this split as a segmentation transformation.¹⁶ A segmentation transformation adjoins E to N and assigns to it the features that are needed for its lexicalization, namely, the syntactic features of number and case and the lexical feature of declension class. Not all words have this splitting property. Uninflected categories like Adv(erb) and P(reposition) lack it entirely, while words belonging to the inflected categories lack it in special cases. For Russian, we may compare /mass/ ‘mass’, a [DC-A] noun which is inflected, with /miss/¹⁷ ‘(English speaking) governess’, a [DC-O] noun which is not.¹⁸ Both nouns occur in sentences with no ending, e.g., in *trudjaščixsja mass* ‘laboring masses’ (gen. pl.) and *naëmnuju miss* ‘hired (English speaking) governess’ (acc. sg.). Both nouns can carry number and case features as reflected in the agreeing adjectives. Undergoing segmentation, [_N/mass/] acquires the structure

¹⁶ Segmentation transformations were first proposed by Postal (1966). “These are rules which insert segmental elements into phrase markers on the basis of syntactic feature specifications present at earlier, more abstract stages of derivation” (210). He doesn’t spell this out, but in a footnote he adds : “It is my feeling, however, that such rules characterize whatever is really common in those features of language that have been referred to as *inflection*. That is, inflectional elements are those segments added by *segmentation* provided these elements are added in such a way that they become part of the same *word* as does that element whose features they mark.” Accordingly, we speak of the ending being adjoined to the noun because the noun is N and the noun-ending combination, [_N N E], is also N.

¹⁷ Since *miss* never occurs with an ending, thus no *[m’is.sV], there is no basis for representing it in the lexicon with two /s/’s.

¹⁸ The reason nouns like /miss/ are not uninflected is not that they end in a consonant (Halle 1990:180): *all* Slavic lexical nouns end in a consonant. Rather, all *forms* of /miss/ end in a consonant because /miss/ is uninflected. /miss/ is uninflected because it belongs to DC-O and is feminine. Foreign family names like /ginzburg/ are likewise uninflected when they are feminine, i.e., inserted under an N specified [FEM]; under a [MASC] N they are inflected. In Polish, DC-O titles for women are [FEM], hence uninflected: *profesor Dąbrowska*, acc. *profesor Dąbrowską*. In Russian they are [MASC] and inflected: *professor Tolstaja*, acc. *professora Tolstuju*.

[_N [_N/mass/] E] with an E specified [+PLUR], [GEN], and [DC-A]. The lexical rule applying to this E returns from the lexicon empty-handed, because no sound-meaning pairing with this set of features is to be found there. Rather than say a zero ending is introduced, I prefer to say no ending is introduced.¹⁹ In [_N/miss/], the feature combination [FEM] and [DC-O] prevents ending segmentation from occurring. Thus in the above phrases gen. pl. *mass* is structured [_N [_N/mass/][_E]] with an ending constituent which goes unlexicalized for lack of an ending, while acc. sg. *miss* is structured [_N [_N miss]] with no ending constituent to be lexicalized. The nothing that follows *mass* is a morphological nothing which corresponds to a syntactic something, whereas *miss* is followed a morphological nothing which is also a syntactic nothing.

Degenerate inflection. Phoneme strings that follow noun stems in specific syntactic environments fall in the domain of inflectional morphology because they cannot be accounted for in the phonology component of the grammar. This applies to Polish neuter nouns borrowed from Latin like *muzeum*, *centrum*, and *medium*. All the singular forms end in *-um* (nom. *muzeum*, acc. *muzeum*, gen. *muzeum*, loc. *muzeum*, dat. *muzeum*, instr. *muzeum*), while the plural forms instead of *-um* show the regular plural endings (nom. *muzea*, acc. *muzea*, gen. *muzeów*, loc. *muzeach*, dat. *muzeom*, instr. *muzeami*).²⁰ My constrained phonology rules out a stem /muzeum/ which is truncated in the plural, so we must recognize /um/ as a degenerate ending occurring throughout the singular. Saying no to truncation extends the range of facts to be accounted for under the rubric of inflection. Consider the following alternations in Russian: *pal'tó* ‘overcoat’ ~ *pal'tiško* ‘idem’ (dimin.), *taksí* ‘taxi’ ~ *taksíst* ‘cab driver’, *kengurú* ‘kangaroo’ ~ *kengurënok* ‘joey’. The lexical items these pairs of word forms share are /pal't/, /taks/, and /kengur/. When these three nouns occur in sentence environments where they are not followed by a derivational suffix, /o/, /i/, and /u/, respectively, are introduced. I see no alternative to regarding these phonemes as degenerate inflectional endings for which these nouns are

¹⁹ AG80 (506) proposes that nouns like these belong to a “null declension”, the paradigm of which consists of homophonous forms with a null ending, e.g., nom. sg. [_N [_N/pal'to/][_{En}/#/]], gen. sg. [_N [_N/pal'to/][_{En}/#/]], dat. sg. [_N [_N/pal'to/][_{En}/#/]], etc. But if this noun is /pal't/ in the lexicon, then what follows it in these forms is not /#/ but /o/, i.e., nom. sg. [_N [_N/pal't/][_{En}/o/]], gen. sg. [_N [_N/pal't/][_{En}/o/]], dat. sg. [_N [_N/pal't/][_{En}/o/]], etc.

²⁰ The Polish Academy Grammar is of two minds regarding *-um* nouns: they either extend the stem in the singular (113) or truncate it in the plural (263).

specified in the lexicon.²¹

Case syncretism. When two noun forms in different syntactic environment take the same ending, this is an instance of case syncretism.²² Viewing inflectional endings as lexical items, we need to distinguish between the same ending occurring in several inflected forms and different endings which happen to be homophonous. In the latter case little needs to be said; it is a common occurrence for two morphemes to coincide in their phonemic makeup. In the former case, we need to identify the lexical features of the multiply occurring ending and formulate the transformations by which it comes to occur in an environment with different features. In a number of Slavic languages animate masculine DC-O nouns show the same ending in the accusative singular and genitive singular forms—a Slavic development which remedied the nominative-accusative homophony resulting from the reduction and falling together of accusative **-om* with nominative **-os*. The /a/ ending making its appearance in the accusative singular form is the genitive ending, and the substitution is made with a transformation applying to a [N/.../] specified [-PLUR], [ACC], and [DC-O] which changes [ACC] to [GEN]. For another example, the nominative/accusative contrast seen in the plural OCS forms *gradi/grady* ‘cities’ was variously restructured in several Slavic languages. Russian generalized the accusative /y/ ending to nominative environments for all but two nouns, Czech did so for all but animate nouns, and Polish for all but nouns denoting male persons. The feature switch in question is [NOM] → [ACC].

Verbal inflection. Verbal inflection in Slavic is different from nominal. With nouns, recognizing declension classes is unavoidable because there are differences between DC-A and DC-O endings, e.g., instr. sg. *ženojo* , and *gradomь*, which phonology

²¹ Quirky case endings are not that uncommon. The plural Russian nouns /šč/ ‘cabbage soup’ and /drov/ ‘firewood’ in addition to their regular genitive forms *ščej* and *drov* also take the exceptional genitive plural ending /ec/: *ščec*, *drovec*. The *Orfografičeskij slovar* chooses to recognize *two* nouns for ‘cabbage soup’, one having only a gen. pl. form, and the same for ‘firewood’.

²² For Zwicky (1985), what I call ending insertion is a matter either of *exponence*, “how certain combinations of morphosyntactic features are realized, in the context of certain other bundles, as morphophonological operations” (372) or of *referral*, “stipulating that certain combinations of features have the same realization as others” (374). The latter is not a rule but simply a statement of fact, e.g., that the acc. sg. DC-A ending of *sestrú* ‘sister’ is homophonous with the dat. sg. DC-O ending of *brátu* ‘brother’. Understood as a rule, it would entail the claim either that *sestrú* shows the DC-O ending of *brátu* or that *brátu* shows the DC-A ending of *sestrú*. Thus with enough referral rules we could make the (dubious) claim that the lexicon contains no homophonous endings.

cannot bridge. But for verbs recognizing conjugation classes is unnecessary because they can be shown to all select the same set of personal endings. Compare the present-tense forms of /nes/ ‘carry’, which are 1sg. *neso* , 2sg. *neseši*, 3sg. *nesetъ*, 1du. *nesevě*, 2du. *neseta*, 3du. *nesete*, 1pl. *nesemъ*, 2pl. *nesete*, 3pl. *neso* , *тъ*, with the corresponding forms of /xval/ ‘praise’, which are 1sg. *xvaljo* , 2sg. *xvališi*, 3sg. *xvalitъ*, 1du. *xvalivě*, 2du. *xvalita*, 3du. *xvalite*, 1pl. *xvalimъ*, 2pl. *xvalite*, 3pl. *xvalętъ*. Most of these forms are transparently tripartite; the endings are separated from /nes/ by the theme vowels /e/ ~ /o/ and from /xval/ by /i/. Only in two forms has sound change somewhat diminished analyzability. In 3pl. *neso* , *тъ* and *xvalętъ* contrasting theme vowels fuse with the nasal of the ending /ntъ/ to produce contrasting nasal vowels. In 1sg. *neso* and *xvaljo* the theme vowel fuses with the person-number ending, presumably the same /m/ that occurs in the athematic forms *damъ*, *věmъ*, *ěmъ*, and *esmъ* only without the following vowel,²³ Several Slavic languages have restructured this form by generalizing the preceding theme vowel and following /m/ with underlying /b/, e.g., S-Cr. *nesem*, Cz. *chválím*.²⁴ Sound changes since early Slavic have not entirely obscured this structure. In modern Russian, deriving *nesút* from [v [v/nēs/]/o/ [E/nt/]] and *xváljat* from [v [v/xval/]/i/ [E/nt/]] faces obstacles not present in early Slavic, e.g., forms like *zont* ‘umbrella’ and *vint* ‘screw’ in which tauto-syllabic /on/ and /in/ do not monophthongize to /u/ and /a/. But they can be overcome. We can place morphological restrictions on the needed sound changes or else make the underlying representations more abstract. The alternative is recognizing conjugation classes, i.e., categorizing verbs in the lexicon for selecting different sets of endings. Surely it is preferable to categorize them for the theme vowels which precede the endings. The main categorization is into those which take /e/ ~ /o/ and those which take /i/, with subcategorization according to the themes which precede /e/ ~ /o/ and the themes occurring in preterit and nonfinite forms.²⁵

Verbal themes, besides being more consistently transparent than nominal themes,

²³ Meillet (1934:311) connects the nasality of 1sg. *-o* with the /m/ of the athematic ending *-mъ*, and Janda (1994) chronicles the spread of *-m* as a surface marker of first person singular in several Slavic languages.

²⁴ The Czech restructuring of *xvaljo* as *chválím* eliminated the anomaly of *xvaljo* having two thematic vowels, /o/ preceded by /i/ reflected in the iotation of the stem consonant.

²⁵ See Leskien 1910:138–64.

differ from the latter in playing an important role in inflection, specifically in aspect morphology. According to a broad consensus among Slavists, the [\pm Perfective] opposition among lexically identical prefix-verb compounds is inflectional. Thus pairs of forms like *sътрѣсетъ* and *sътрѣсаетъ* ‘shake’ differ only in that the former occurs in a predicate phrase specified [+PERFECTIVE], the latter in a predicate phrase specified [-PERFECTIVE]. Some Slavists regard the segments separating verb from ending in *sътрѣсаетъ* as an imperfectivizing suffix. But the presence of a suffix (a morpheme) in *sътрѣсаетъ* which is absent in *sътрѣсетъ* is incompatible with their being inflected forms of the same prefix-verb compound. What we see here is an inflectional process, the aspectually sensitive introduction of themes separating verb from ending, not a derivational process introducing a suffix.

Thematization. That word forms in Slavic, as in other inflected Indo-European languages, are tripartite has long been recognized. Meillet wrote that the root, the theme, and the ending in Indo-European word forms are “elements of substitution” and that the linguist’s task is to segment the word form, classify the segments, and study their phonology. (He adds that it is for the psychologist to determine how the speaker actually performs these substitutions,²⁶ but this should not inhibit us from embedding the morphophonemics of verb forms in the syntax of the sentence.) Having segmented the above two forms as *sъ-трѣс-е-тъ* and *sъ-трѣс-aje-тъ*, we classify /sъ/, /трѣс/, and /тъ/ as morphemes, introduced into the sentence by the lexical rules $P \rightarrow /sъ/$, $V \rightarrow /трѣс/$, and $E \rightarrow /тъ/$, and we are left with the thematic elements /e/, /j/, and /a/. These I propose are introduced into the verb form by a class of readjustment rules called thematizations. *Сътрѣсетъ* and *сѣтрѣсаетъ* share the lexical structure $[_V [_V [_P /sъ/]] [_V /трѣс/]] [_E /тъ/]]$. In a [+PERFECTIVE] predicate phrase it is thematized only for /e/, thus $[_V [_V [_P /sъ/]] [_V /трѣс/]] /e/ [_E /тъ/]]$, because this theme rather than /o/ is selected by the 3sg. ending. In a [-PERFECTIVE] predicate phrase it is additionally thematized to $[_V [_V [_P /sъ/]] [_V /трѣс/]] /j/ /e/ [_E /тъ/]]$ (because /j/ is the regular hiatus filler between /a/

²⁶ Meillet (1937/1964:148–49): “[L]a racine, le suffixe et la désinence de l’indoeuropéen [...] n’ont pas à être envisagés autrement que comme des éléments de substitution: par exemple -s et -te se substituent l’un à l’autre dans gr. *efere-s* et *efere-te* suivant qu’on veut dire «tu portais» ou «vous portiez»; mais, ainsi conçus, ils sont des réalités. Il appartient aux psychologues de déterminer comment s’opèrent les substitutions dans l’esprit des sujets parlants; la tâche du grammairien est de reconnaître ces éléments, de les classer et d’en suivre les transformations.”

and following themes) and then for [V [V [P /sʲ/] [V /trɛs/]] /a/ /j/ /e/ [E /tʲ/]] (because /a/ is the regular imperfectivizing theme for prefix-verb compounds occurring in a [-PERFECTIVE] environment.²⁷

Unlike the introduction of an ending, which is simply lexical insertion, thematization deserves to be considered a morphophonemic process because in many cases it is phonologically motivated, with consonants being introduced between vowels to eliminate hiatus and vowels between consonants to lessen allomorphy. For example, between the verb /da/ ‘give’ and the imperfective theme /a/ in early Slavic sometimes /j/ was introduced (*dajati*), sometimes /v/ (*davati*), and between the verb /zna/ ‘know’ and the passive suffix /om/ Russian inserts /k/ (*znakomyj*) and Polish and Czech insert /j/ (*znajomy* and contracted *známý*). Examples of inserted vowels are the /o/ which early Slavic speakers introduced between the verb /žeg/ ‘burn’ and the 3pl. aorist ending /šɛ/, restructuring the radically allomorphic *-žašɛ* to the more transparent *-žegošɛ*, and the /i/ which Old Russian speakers introduced between /ěd/ ‘eat’ and the 2pl. ending /te/ to turn *ěste* into *ědite*. Because of thematization rules, word forms in Slavic are not exclusively structured concatenations of morphemes; they are not only arranged items, they are also processed items.

“Russian Conjugation”. The preceding proposals are somewhat at odds with those made by Roman Jakobson in his highly influential 1948 article “Russian Conjugation”. Whereas I accept the tripartite (verb-theme-ending) analysis of Slavic verbforms studied by generations of Slavists trained in historical-comparative grammar and propose to account for the distribution of themes with a class of readjustment rules called thematizations, Jakobson proposed a bipartite analysis into stem and ending with themes assigned sometimes to the stem, sometimes to the ending, and sometimes subsumed under morphophonemic rules.²⁸ For example, the /i/ present theme of *vidite* ‘you see’ is assigned to the ending, while the /ě/ preterit theme of *viděste* ‘you saw’ is

²⁷ The implicational relationships among the various verbal themes are stated more fully in Gladney 1985. That the various thematic elements are independently selected and independently conditioned is another argument against considering such thematic strings as /aje/ and /yvaje/ as imperfectivizing suffixes (morphemes).

²⁸ Elson (1997) assigns them to the stem, which in a number of cases, e.g., Mac. *pasa-* / *pase-* ‘graze’, results in variant stems. He declines to address the suppletion problem raised by variant stems, saying “the generative relationship between the variants” does not concern him (648).

assigned to the stem.²⁹ In the interests of having a single stem in both present and preterit forms, Jakobson posited the stem /vidě/ also in present-tense forms like *vidite*. To explain the absence of /ě/ in this form he introduced the rule of vowel truncation, $V \rightarrow \emptyset / ___ V$.³⁰ The /j/ present-tense theme of *rabotajetʹ* ‘serves’ was assigned to the stem and /rabotaj/ was posited also in preterit forms like *rabotaše* ‘they served’. Its absence in this form is accounted for with a rule that deleted sonorants before a consonant. The /a/ preterit theme of *kazaxʹ* ‘I showed’ was assigned to the stem, which was said to occur underlyingly also in present-tense *kažetʹ* ‘he shows’. In this case the thematic /j/ of underlying $[_V [_V /kaz/] /j/ /e/ [_{EV} /tʹ/]]$ was subsumed by the morphophonemic rule $/z/ \rightarrow [ž]$ which was linked to the truncation of the stem /kaza/ by the ending /etʹ/.

The stream of research on Slavic morphology and phonology loosed by Jakobson’s path-breaking article wore down some of its more original features and brought it more into line with traditional analyses. For example, the $/kaz/ \rightarrow /kaž/$ shift started being ascribed not to the truncation of thematic /a/ but to the underlying presence of thematic /j/. The inclusion of aspect morphology (Halle 1963) furthered this trend. The progressive erosion of distinctions between synchronic and diachronic descriptions of Slavic verbal morphology struck Garde (1965:145) as paradoxical. Reviewing Halle 1963 he observed that the synchronic rules of generative phonology are either a reformulation of diachronic sound changes or else they are wrong.³¹ Actually, this is not

²⁹ Jakobson’s “single-stem” analysis treated only Russian but was subsequently applied to virtually all of the Slavic languages, including Old Church Slavonic in Halle 1951. In my summary of it I am substituting OCS forms,

³⁰ Jakobson’s 1948 rules have shown remarkable longevity, even productivity. For Halle (1994), vowel truncation ($V \rightarrow \emptyset / ___ V$) figures also in Russian nominal declension. He proposes that noun forms conform to the template $[_N \text{ Stem } Q Q]$, where the Qs are abstract formatives that get rewritten by readjustment rules. Nom. sg. *žená* is underlying $[_N /žen/ Q Q]$, where the first Q is realized as thematic /o/ but is truncated by the second Q, which is /a/. Loc. pl. *ženaxʹ* is likewise $[_N /žen/ Q Q]$, but the first Q, /o/ readjusted to /a/, is not truncated by the second Q because the two are separated by /x/, introduced by a readjustment rule. See also Pullum and Zwicky 1991.

Halle up-dates Jakobson’s rule of sonorant deletion by saying it occurs before a syllable onset, thus recognizing syllabification as an early phonological rule. This further undermines the standing of truncation as a phonological process. If Halle’s nom. sg. $[_N /žen/ /o/ /a/]$ is syllabified to $[_N /ze.no.a/]$ (and Jakobson’s original $[_V /pisa/ /ot/]$ to $[_V /pi.sa.ot/]$), we would expect a hiatus-filling glide to develop in the onset of the third syllable, resulting in **ženova* (and **pisavot*), similarly as a hiatus-filling /v/ develops when $[_V [_V /da/] [_E /i/]]$ ‘give!’ in a [-PERFECTIVE] environment is thematized for /a/ and syllabified to $[_V /da.a.i/]$, resulting ultimately in *daváj*.

³¹ “Nous arrivons donc à ce dilemme: ou bien les ‘règles synchroniques’ sont une nouvelle formulation des lois diachroniques, ou bien elles sont fausses.”

a paradox; if synchronic allomorphy provides us with roughly the same array of facts as diachrony, and if synchronic phonological rules are constrained from effecting sound changes (such as $V \rightarrow \emptyset / ___ V$) which are not attested in diachrony, we do not expect it to be otherwise.³² What is perhaps the ultimate elaboration of “Russian Conjugation” is offered by Coats and Lightner (1975). They retire vowel truncation from the phonology and propose to account for forms like *kažetʹ* with what they call “the morphological rule V-drop”. For this form they posit what they call the productive verbal suffix /aj/, thus underlying $[_V [_V /kaz/] /aj/ [_E /etʹ/]]$; /a/ undergoes V-drop, thus creating the environment for /zj/ \rightarrow [ž].

The insights into Slavic verbal inflection found in Jakobson 1948 and its later elaborations can all be captured equally well by lexically specifying verbs for the themes they take in various syntactic environments. The alternations of *viděste* with *vidite* and of *kazaxʹ* with *kažetʹ* which Jakobson represented with the “full stems” /vidě/ and /kaza/ are accounted for by specifying /vid/ and /kaz/ for /ě/ and /a/ in preterit environments only, since this entails /i/ and /j/ in present-tense environments.

The limits of nominal inflection. Nouns are inflected for case and number, but the two features differ. Case is assigned by transformation according to the noun’s role in the sentence, while number is base-generated. This may be related to Peškovskij’s (1956:32) considering only case in nouns to be syntactic, i.e., inflectional, while regarding number as derivational.³³ He bases this judgment on meaning. The various case forms of a noun are absolutely synonymous, their formal differences being dependent on the syntactic environment, but plural forms, e.g., *stolý*, *stolóv*, *stolám* ‘tables’, have a different referent from singular *stol*, *stolá*, *stolú* ‘table’, and number is largely independent of context. This may explain why plural forms of a noun can be suppletive with regard to singular forms, while this is never the case within the singular and plural subparadigms of a noun.

Some nouns do not occur in [+PLURAL] NPs, often for semantic reasons. Possibly

³² My equating of generative phonology with internal reconstruction is contested by Lass (1977), who claims that internal reconstruction, which differs only in its goals from internal reconstruction, does not yield reliable results because it fails to discover intermediate stages in a series of sound shifts as well as sound shifts which are canceled by their reversals.

³³ This view has a tradition in Russian linguistics, as noted in Belošapkova 1981:270.

no early Slavic speaker ever perceived tranquillity in multiple manifestations, which would have called for plural forms of the noun /tixost/. But a plurality of male siblings has always been a common occurrence, so it is hard to understand why in early Slavic the noun /bratr/ seems not to have had plural forms, why singular forms literally meaning ‘brotherhood’—*bratrija*, *bratrijo* , *bratrije*, etc.—were used instead. Also hard to understand is why /kamen/ ‘stone’, which is clearly a count noun, e.g., in *otъvali kamenъ ot dvъrii groba* ‘(he) rolled back the stone from the door of the tomb’, did not have count plural forms, singular collective forms like *kamenije* being used instead, for example in *rъci kamenъju semu da bo do tъ xlъbi* ‘command these stones to become loaves of bread’. *Bratija* and *kamenije* show homophonous [-COUNT] /ij/ suffixes; the former is specified DC-A and derives a feminine stem from masculine DC-O /bratr/, the latter bears the [NEUT] feature and derives a neuter DC-O stem from masculine /kamen/. Conversely, early Slavic had nouns which denoted a plurality of referents and had only plural forms, e.g., /graždan/ ‘citizenry’; when referring to an individual drawn from this plurality the suffix /in/ was introduced (*graždaninъ*). The occurrence of /bratr/ or /kamen/ in a [+PLURAL] NP or of /graždan/ in a [-PLURAL] NP was ungrammatical, and speakers resorted to suppletion to compensate for the nonoccurring forms. They expanded N to [_N NN] and lexicalized the latter as /ij/ or /in/. This is not inflection but derivation, which is discussed in more detail below.

As Unbegaun (1935: ch. 5) has shown, this system of singular nouns suppleted by morphologically singular collectives and collective plurals suppleted by singulative singulars was fully productive in sixteenth-century Russian, where, for example, singular *gvozd* ‘nail’ was matched in plural environments by collective *gvozd’e* and the syntactically plural but morphologically singular *litva* ‘Lithuanians’ in singular environments was matched by singulative *litvin*.

The modern-day reflexes of these constructions pose problems. The plural of ‘brother’ in most Slavic languages reflects the collective suffix /ij/. Where it has undergone contraction, as in Po. *bracia* and Bg. *bratja*, the palatalization of stem-final /t/ could plausibly be subsumed under phonology (the A → B portion of the sound change involves phonological features even if the C is purely grammatical). But in *brát’ja*, *brát’ev*, etc., the /ij/ suffix (elided to [j]) cannot readily be subsumed under phonology. It is not only a matter of constraining phonology from introducing phonemes, but this suffix

is productive in kinship terms, as seen in *synov'já* 'sons', *zjat'já* 'sons-in-law', *kumov'já* 'godfathers', *djad'já* 'uncles', also *knjaz'já*, etc. The fact that these are plural forms selecting plural endings shows that the original collective meaning of /ij/ has been diluted. Nevertheless, it appears that Russian speakers conceptualize male kinfolk as sets. Note the meaning difference between *djad'já* 'uncles' and *djádi* 'adult males'.

As for the modern Russian reflexes of the *kamenije* constructions, there are a number of nouns which in the plural occur both with and without the /ij/ suffix. They include /kol/ 'stake', /klin/ 'wedge', /klok/ 'tuft', /krük/ 'hook', /list/ 'leaf', /prut/ 'twig, bar', /suk/ 'bough', and /zub/ 'tooth'. Russian grammars and dictionaries treat /ij/ (elided to [j]) as a "stem increment", subsuming it under phonology.³⁴ And since the forms with /ij/ in many cases have idiomatic senses, e.g., *zúby* 'teeth' (human or animal) vs. *zub'já* 'teeth' (machine), these sources posit distinct nouns with homophonous singular forms. But idiomaticity in a N+/ij/ construction does not negate the contribution of the collective suffix, diluted though it is by plurality. The semantic contribution of /ij/ is often systematic: *list'ja* and *prút'ja* denote leaves and twigs as undifferentiated masses in their natural state, whereas *listý* and *prutý* denote man-made, discrete objects (pages of a book, rods). Therefore it seems wrong to list /ij/ forms and /ij/-less forms simply as alternate plurals, considering both *súč'ja*, *súč'ev*, etc. and *sukí*, *sukóv*, etc. to be inflectional forms of /suk/ 'bough', while regarding the collective singular *suč'ě* as a separate, derivationally related noun. True, there are nouns like /stul/ 'chair', which are always accompanied by /ij/ in plural environments (*stúl'ja*, *stúl'ev*, etc.), where /ij/ is semantically depleted. But a morpheme which undergoes semantic depletion in the environment of some other morpheme does not cease being that morpheme.

Short forms of adjectives. In early Slavic, adjective forms in some sentence environments were followed by enclitic pronouns inflected with the same number, case, and gender features. Thus next to *dobra* 'good' (sg. masc. gen.) we find also *dobrajego* and next to *novo* 'new' (sg. acc. fem.) we find also *novo jo*.³⁵ However, already in earliest attested Slavic, sound changes make it difficult to separate the adjective from the

³⁴ Or morphophonology. The difference is immaterial: if $A \rightarrow B$ is storable in features, I consider it phonology, whether or not the C is morphological (syntactic).

³⁵ See Lunt 1974, Epilogue 22.5. The pronoun form *jego* is spelled *ego* in glagolitic manuscripts. I transliterate the cyrillic spelling because it better represents morphological structure.

pronominal clitic. In modern Russian it comes down as a matter of inflection: two sets of endings, a larger set of longer endings for adjectives used attributively and a smaller set of shorter endings for adjectives used predicatively. We could account for their distribution as follows. A phrase-structure rule assigns a feature [PREDICATIVE] to adjective phrases occurring as complements of copulative verbs, thus $VP \rightarrow V_{\text{COPULA}} AP_{\text{PRED}}$. This feature is passed down by subsequent expansions of the predicate adjective phrase, so that when A_{PRED} undergoes ending segmentation the result is E_{PRED} , which serves as input to lexical rules that introduce the predicative endings /a/, /o/, and /y/.³⁶ Another phrase-structure rule assigns a feature [ATTRIBUTIVE] to adjective phrases included in noun phrases, thus $NP \rightarrow AP_{\text{ATTRIB}} NP$.³⁷ This feature is likewise inherited by the adjective and segmented out to the adjective ending, so that lexical rules applying to E_{ATTRIB} introduce the endings /oj/, /ovo/, /aja/, /uju/, etc. To account for the predicative use of long adjective forms, as in *Olja umnaja* ‘Olga is a smart woman’, we must represent the predicate complement as a noun phrase headed by an unlexicalized N specified [FEM].

Inflection for mood. Verbs in Slavic are inflected for the feature [\pm REAL]. We disregard the analytic constructions which Jakobson (1957: ¶3.4) calls conditional, which employ inflected or frozen forms of /by/ and lie beyond the scope of verbal inflection, and focus on the forms he calls injunctive. They signal the narrated event as imposed on the participant, either as a direct appeal, e.g., *piši!* ‘write!’, or “transposed into a declarative statement”, e.g., *piši oná stixí...* ‘should she write poetry...’. Because this form is most frequently used in the imperative function—in most Slavic languages it is so used exclusively³⁸—it is commonly called the imperative. In early Slavic it selected the secondary endings that occur in aorist forms and preceded them with theme vowels that differed from those occurring in indicative forms. Thus inflection is not exclusively a matter of endings; it can also involve theme vowels, as is also the case with inflection for

³⁶ The [-PLUR, MASC] $E_{\text{A-PRED}}$ ending is null, i.e., there is no such ending in the lexicon. Let me reiterate that the lexicon as conceived here contains only sound-meaning pairings; it does not list meanings unassociated with phonemes. However, it is possible that word-final []’s in some cases may not be lexical but the result of sound change,

³⁷ Since there are only two sets of adjective endings, instead of designating them [PREDICATIVE] and [ATTRIBUTIVE] we could make do with a single binary feature, [\pm PREDICATIVE].

³⁸ Polish has the frozen expressions *Bóg zapłać* ‘may God reward you’ and *szczęść Boże* ‘Godspeed’.

[±PERFECTIVE]. To some extent the theme-vowel opposition is still reflected in Czech, where, for example, in the singular we find *řekni* ‘say!’ and in the plural *řekněme* ‘let’s say’ and *řekněte* ‘say!’, with the latter two forms differing from indicative *řekneme* and *řeknete*. In Russian the theme vowel has been restructured as an ending and the 2pl. ending as a clitic, e.g., *idí, idíte, iděmte* ‘let’s go’.

Inflection for tense. Verbs in Slavic may be inflected also for tense. A verb occurring in a predicate specified by the base rules [+PAST], having person and number features assigned to it by agreement transformations, undergoes ending segmentation resulting in the structure [V V E]. In early Slavic an E specified with these three features was lexicalized as 1sg. /ъ/, 2sg. /t/, 3sg. /t/, 1du. /vě/, 2du. /ta/, 3du. /te/, 1pl. /mъ/, 2pl. /te/, or 3pl. /nt/. The unmarked past tense is the aorist; there is also the imperfect tense, which presents the action or state as coordinated with some other action or state in the past (Lunt 2001:155). So early Slavic predicates that are specified [+PAST] are in addition specified [±COORDINATED]. Aorist and imperfect forms share the set of [+PAST] endings, but aorist forms differ among themselves and with imperfect forms in their thematization. For example, /sěd/ ‘sit’ has the following forms with the minimal thematization, which was unproductive: 1sg. *sědъ*, 2sg. *sěde*, 3sg. *sěde*, 1du. *sědově*, 2du. *sědeta*, 3du. *sědete*, 1pl. *sědomъ*, 2pl. *sědete*, 3pl. *sědo* , which show thematic /e/ before dentals and thematic /o/ before labials (word-final obstruents are deleted, as generally). Other verbs, e.g., /ved/ ‘lead’ and /rek/ ‘say’, precede thematic /e/ and /o/ with thematic /s/, which sometimes shifts to /x/ (and /š/), e.g., 1sg. *věsъ*, *rěxъ* and 3pl. *věse*, *rěše*. The productive aorist pattern introduced thematic /o/ between the stem consonant and thematic /s/; thus /id/ ‘go’³⁹ in addition to the /s/-less forms 1sg. *idъ* and 3pl. *ido* , has 1sg. *idoxъ* and 3pl. *idoše*. In [+PAST] predicates that are [+COORDINATED], verbs are additionally thematized with the string /ěax/.⁴⁰

³⁹ In view of the infinitive *iti*, the lexical representation of this verb; the /d/ is thematic.

⁴⁰ See Lunt 2001:§§ 9, 10 for details. What I am calling themes Lunt categorizes differently. For example, he says the termination of *idoxъ* shows the “desinence” *-(o)xъ*, but the *-x-* is termed a “past-marker” (2001:102) (in the 1974 edition of this work (87) *-(o)xъ* is termed a “suffix”). My assumption is that an inflected word form consists of a stem and an ending, and that if *idъ*, *idoxъ*, and *iděaxъ* are all [+PAST] inflected forms of this verb they are all structured [V V E] and the phonemes separating these two morphemes are themes introduced by tense-sensitive readjustment rules. In other words, *idoxъ* and *iděaxъ* are not derived from /id/ (or rather /ei/) with /ox/ and /ěax/ suffixes (or “markers”) and then inflected with

In the modern Slavic languages which retained the aorist and imperfect tenses, the aorist has lost the “strong” / ”weak” contrast, seen in 1sg. *idь/idoxь* and 3pl. *ido /idoše*, which enable us to isolate the endings listed above, and as a result (the reflex of) thematic /s/ was reanalyzed as (part of) the ending. For Serbo-Croatian the aorist endings are 1sg. /h/, 2sg. /Ø/, 3sg. /Ø/, 1pl. /sme/, 2pl. /ste/, 3pl. /še/; for Bulgarian they are 1sg. /x/, 2sg. /Ø/, 3sg. /Ø/, 1pl. /xme/, 2pl. /xte/, 3pl. /xa/. After consonantal stems the 2sg. and 3sg. forms are thematized with /e/ and the other forms with /o/. The North Slavic languages mostly lost the aorist and imperfect tenses and hence do not have inflected past-tense forms (see below).

There is no inflected future tense in Slavic. For referring to actions expected to take place subsequent to the moment of utterance, early Slavic used a variety of modal verbs meaning ‘want’, ‘be’, ‘have’, and ‘take’ (Lunt 2001: §21.11). For this purpose the modern Slavic languages employ some of these verbs, sometimes in frozen or cliticized form, e.g., *búdet čítát’*, Bg. *šte čete*, Ukr. *čytatyme* ‘will read’.⁴¹ These constructions fall outside the scope of verbal inflection.⁴²

Nonfinite verb forms. Inflected, or finite, verb forms are structured [_V V E] with an ending expressing person. Forms where V is followed by a suffix instead of an ending are nonfinite. They are not verb forms: if the suffix is a noun suffix they are nouns (noun stems, [_N V N]), and if it is an adjective suffix they are adjectives (adjective stems, [_A V A]).⁴³ However, certain noun and adjective suffixes occurring with verbs play such a prominent role in syntax that for those who define inflection as syntactically relevant

the ending /ь/; they are inflected for /ь/ and then thematized (optionally in the aorist, obligatorily in the imperfect).

⁴¹ The prefix /po/ that in Czech is used with verbs of motion (broadly construed), e.g., *ponese* ‘will carry’, *poletí* ‘will fly’, *potáhne* ‘will pull’, has more in common with *búdet* and *šte* than with inflection.

⁴² This limitation of verbal inflection to forms structured [_V V E] is vigorously rebutted by Vinogradov (1972:342): “The verb unites a wealth and variety of meanings with a wealth and variety of forms. All the person, number, tense, and mood forms of a verb (*stroju, stroim, ja stroil, my stroili, ja stroil by, strojte*, etc.) are conjugated forms of a single word. Even when the forms sharply differ phonetically (*ja leg – ljagu – ljažem – ljag; ja sel – sjadu – sjad’; poju – ja pel – poj; p’ju – ja pil – pej; ja mjal – mny – mni; ja vzjal – voz’mu – budu brat’; idu – ja šel*, and so on) there can be no doubt that these are grammatical forms of one and the same verb.”

⁴³ To say that a verb when followed by a noun or adjective suffix and included in a noun or adjective form is recategorized as a noun or adjective is wrong. It remains a verb, just as an NP included in a VP remains an NP and a VP included in a TP remains a VP.

morphology⁴⁴ their distribution is arguably a matter of inflection. Another argument, although a weaker one, for considering them inflectional is their productivity, their occurring with virtually any verb.⁴⁵ Attempting to distinguish between [N V N] and [A V A] structures that are syntactic, in that sense inflectional, and those which are not, we may say that in the former case suffixation results from a transformational rule, e.g., a raising rule, whereas in the latter case it is base-generated.

Infinitives. Two noun suffixes that occur with verbs in Slavic are the infinitive suffix /ti/ and its modern reflexes and the supine suffix /tь/.⁴⁶ They are frozen case forms of nouns with the suffix /t/ which occurs productively in feminine DC-I nouns such as *zabytʹ* ‘oblivion’. In this noun, which is structured [N [V [P /za/] [V /by/]] [N /t/]], suffixation is due to the base rule N → V N (followed by the expansion of V to P V) and the lexicalization N → /t/. Compare the infinitive *zabyti* ‘to forget’, as in *ne imamʹ zabyti slovesʹ tvoixʹ* ‘I will not forget thy words’. The complement of *imamʹ* may be represented approximately as [NP [N /ti/] [VP [V [P /za/] [V /by/]] [NP /slovʹ /tvojʹ]]]. The suffix /ti/ is structured similarly as the infinitive marker *to* in English (whether as a complementizer or the Tense constituent is a question for syntax). The verb raises to /ti/, which is suffixed to it.

Participles. The adjective suffixes that occur with verbs in Slavic are /l/, /ntj/, /bšʹ/, /m/, /n/, and /t/. The forms headed by these suffixes are morphological adjectives because they assume the gender of an associated NP rather than having fixed gender like forms headed by /ti/. When they head phrases which have complements and thus clausal structure, they are termed participles. Participles differ from adjectives employing the same suffixes in that suffixation is transformational for the former but base-generated for

⁴⁴ Anderson 1982:587: “Inflectional morphology is what is relevant to the syntax.”

⁴⁵ Similarly in English, all (nonmodal) verbs can be followed by *-ing* and a participial suffix, and for this reason the nonfinite forms *taking* and *taken*, for example, are sometimes included in the paradigm of this verb on a par with finite *takes* and *took*. Jespersen (1929:87), however, writes: “The sentence-building power is found in all those forms which are often called ‘finite’ verb forms, but not in such forms as *barking* or *eaten* (participles), nor in infinitives like *to bark*, *to eat*. Participles are really a kind of adjectives formed from verbs, and infinitives have something in common with substantives, though syntactically both participles and infinitives retain many of the characteristics of a verb.”

⁴⁶ The supine was on the way out already in early Slavic (Meillet 1934:242, Lunt 2001:160) and will not be discussed further.

the latter.⁴⁷

L-forms. The syntactic relevance of adjectives suffixed with /l/ is that they occur in the perfect tenses, e.g., in *kъde i esi položilъ* ‘where have you laid him’. In perfect-tense constructions the predicate’s head constituent, the functional category Tense, is lexicalized with a form of the copula *byti*, as a result of which the V constituent is recategorized $V \rightarrow A(\text{djective})$, A is expanded as $[_A V A]$, and A is lexicalized with /l/. In early Slavic the [-PAST] feature of the copula was meaningful, denoting the present relevance of a past action, and the present perfect tense was opposed to several past perfect tenses, e.g., *kъde i běaše položilъ* ‘where had you laid him’. In the West Slavic languages, which use the present-tense copula almost exclusively, e.g., Cz. *pracoval jsem* ‘I worked’, Po. *pracowałem* ‘idem’, the time-of-utterance reference has been lost (with actional verbs if not with stative verbs). Thus in *včera jsem pracoval* ‘yesterday I worked’ the past reference of *včera* does not conflict with what otherwise is the present reference of *jsem*, as is the case in **yesterday I have worked*.

In the East Slavic languages, which lost the copula along with the other clitics, the *l*-participle, as in *ja rabótal* ‘I worked’, is routinely described in grammars as an inflected past-tense form. Formal evidence against this analysis is the fact that this form shares the suffix /l/ with fem. sg. *rabótala*, neut. sg. *rabótalo*, and plur. *rabótali*. If these forms contain a suffix they are derived from the verb /rabot/,⁴⁸ not its inflected forms. Semantic evidence against the analysis is the fact that /l/-suffixed forms lack past-tense reference when they occur with the frozen copula *by*, e.g., in *čtoby ja rabótal* ‘that I work’. To say that *by* conditions the use of the past-tense form of the verb may be a convenient classroom mnemonic but has no place in a linguistic description.

With stative verbs like /pux/ ‘swell’ and /usta/ ‘tire’,⁴⁹ the claim that *ja rabótal* ‘I worked’, *eě ščěki púxli* ‘her cheeks swelled’, and so on employ adjective forms is challenged by a possible opposition between these constructions and constructions with the short (predicative) forms of what are claimed to be truly derived adjectives, thus

⁴⁷ Deciding which derivation is applicable is often difficult. Participle/adjectives with /l/ are discussed by Bethin (1985) for Russian and by Cetnarowska (2000) for Polish.

⁴⁸ /rabot/, a noun, is a verb by virtue of the recategorization $V \rightarrow N$, resulting in $[_V [_N /rabot/]]$.

⁴⁹ More exactly, the P-V compound $[_V [_P /u/]] [_V /sta/]$, as discussed below.

between the just-cited ‘her cheeks swelled’ and a possible copula-plus-adjective sentence *eě ščěki (byli) púxly* ‘her cheeks are (were) swollen’. Russian grammars and dictionaries cite formal differences between the past-tense forms of *púxnut* ‘to swell’, viz., masc. *pux*, fem. *púxla*, plur. *púxli*, and what they list as short forms corresponding to *púxlyj* ‘swollen’, viz., masc. *puxl*,⁵⁰ fem. *puxlá*, plur. *púxly*. While the currency of *púxlyj* in attributive (long-form) uses is unquestionable, e.g., *púxlye ščěki* ‘swollen cheeks’, this cannot be said of its predicative (short) forms. The 17-volume Academy dictionary under *púxlyj* gives 14 literary citations with long forms but not one with short forms. A Google search for short forms like *puxl*, *puxlá*, and *púxly* for a number of stative verbs turns up no examples. Zaliznjak (1977:75) writes: “Combinations of the type *ón ustál*, *oná ustála*, *onó ustálo* [‘he, she, it is tired] (which are strictly speaking ambiguous) are perceived in a neutral context as containing finite verb forms”. Note also that the plural long form *ustálye* has no corresponding short form **ustály*. If, as I propose, the stems of these forms are all structured [A V [A /l/]], there is no ambiguity.⁵¹

Other participles. Other adjective suffixes commonly occurring with verbs are /ntj/, /ʙš/, /m/, /n/, and /t/. With /ntj/ we find *člověku zīzdo ,štu xramino , na kamene* ‘a man who builds his house on rock’; with /ʙš/ there is *člověku sʙzʙdavʙšu xramino , bez osnovanʙja* ‘a man who built his house without foundation’. These phrases are equivalent to the relative clauses *iže zīzdetʙ xramino , na kamene* and *iže sʙzʙda xramino , bez osnovanʙja*, and /ntj/ and /ʙš/ are in complementary distribution with the subject *iže*. The subject position of *iže* may therefore be proposed as the underlying position of /ntj/ and /ʙš/, and the raising of the verb results in /ntj/ being suffixed to [V/zid/] and /ʙš/ to [V [P/sʙ/] [V/zʙd/]], with thematization. On this basis *zīzdo ,štu* and *sʙzʙdavʙšu* are considered active participles.

The suffix /m/ occurs in *mo ,žʙ gonimʙ byvaaše běsomʙ* ‘the man was driven by

⁵⁰ Contrasts like *pux* / *puxl* are cited as evidence that the absence of the /l/ in the masculine form, a fact of all consonant-final verbs except those in /t/ and /d/, thus also in *mog* ‘could’, *něs* ‘carried’, etc., is not phonological, the result of /l/ devoicing in the environment C__#. But treating it as morphology is unsatisfactory, entailing the assignment of consonant-final verbs (except those in /t/ and /d/) to a conjugation class which selects /Ø/ rather than /l/ in masculine environments, when membership in this class is entirely predictable from the phonological shape of the verb.

⁵¹ The short form in *ona smelá* ‘she is bold’ is to be explained by the adjective /smel/ having lost its connection with the verb /sme/ ‘dare’, as in *ona ne sméla dumat*, *čto...* ‘she didn’t dare think that...’.

the demon' and /n/ occurs in *pogybъšii bo , detъ sъrasenъ otъ sna čska* 'the lost one will be saved by the Son of Man' (both suffixes are preceded by theme vowels). Observing the Uniform Theta Assignment Hypothesis, according to which "passive subjects must originate in the same position as active complements" (Radford 1997:342), we may view /m/ and /n/ as replacements of the raised complements /mo , ž/ and /pogybъš/. Positioned to the right of the verbs, these suffixes are also suffixed to them. The recategorization of [_V/gon/] and [_V [_P/sъ/] [_V/pas/]] as adjectives calls for a copula at the head of the predicate phrase and the underlying subjects occurring as adjuncts in the verb phrase. How these constituents come to be distributed in these positions is a question for syntax. On the basis of these transformations, *gonimъ* and *sъrasenъ* are considered passive participles.

There are other occurrences of these adjective suffixes which are base-generated. In Russian, some base-generated [_A V [_A/ntj/]] forms differ phonologically from participles with this suffix, e.g., *mogúčij* 'mighty' and *živúčij* 'hardy' vs. *mogúščij* 'being able' and *živúščij* 'living', although others, e.g., *kričáščij* 'blatant' and *vedúščij* 'leading', do not.⁵² Forms structured [_A V [_A/n/]] are also said to show a contrast between base-generated adjectives, as in *oná molčalíva i sostredotóčenna* 'she is quiet and concentrated', and participles, as in *oná sosredotóčena na svoéj rabóte* 'she is concentrated on her work'.⁵³

Word-based word-formation. As should be clear by now, I understand word-formation (derivation) to be morpheme-based: morphemes are combined in the sentence as the result of lexical insertions applying to category symbols generated by sublexical phrase-structure rules. On the other hand, in word-based word-formation morphemes are said to combine into words (stems) in the lexicon, which means that the task remaining for word-formation is to reduce the redundancy of a lexicon which lists the same morpheme in numerous combinations. This involves a version of what Jackendoff (1975) calls the Impoverished Lexical Entry, as follows. A simple (monomorphemic) word has a tripartite lexical entry: a string of phonemes, a grammatical characterization, and a semantic characterization. For example, the entry for the verb *zъdati* would consist

⁵² Russian forms with -šč- are discussed in Jones and Levine 2002.

⁵³ Examples from *Orfoèpičeskij slovar'*; other examples and discussion in Gladney 1991.

of the phoneme string /zʲd/, information regarding its part of speech, valence, and thematization, and the semantic characterization ‘build’. The complex (polymorphemic) noun *zʲdateljʲ* on the other hand has a sparser entry: the phoneme string /zʲdatelj/ and the grammatical characterization [N, MASC, DC-O]; but in place of the semantic characterization ‘one who builds’ it is coded with a reference to a word-formation rule which says that a lexical entry terminating in the phoneme string /telj/ means ‘one who does...’ what is denoted by the lexical entry matching this one minus /telj/.⁵⁴ Redundancy in the lexicon is thus reduced in that the meaning ‘build’ is paired with /zʲd/ only in the lexical entry for this phoneme string, not also in the entry for /zʲdatelj/. The statement that *zʲdateljʲ* is “derived from” *zʲdati* is dispreferred by Slavic grammarians because of its diachronic reading, i.e., that Slavic speakers at one stage had only *zʲdati* and at a later stage employed a suffix to coin *zʲdateljʲ*. Instead one says that *zʲdateljʲ* is “motivated by” *zʲdati*.⁵⁵

In word-based descriptions of word-formation, a word is derived from (motivated by) another word only if the latter exists, by which is meant occurs as a word form. This was discussed several decades ago in connection with the noun *aggression*: whether it can be considered a deverbal noun if no one says *X aggresses against Y*. Word-based word-formation, if generative, calls for truncation. For example, if we recognize the verb /educ/ which is common to the verb form *educate* and the adjective form *educable*, then the latter is simply a matter of suffixation. But deriving *educable* from *educate* requires truncation.⁵⁶

In Slavic this issue is raised by *jarʲmʲnikʲ* ‘beast of burden’. OCS texts do not attest an adjective form with the stem *jarʲmʲn-*, e.g., no *jarʲmʲnyi velʲbo dʲ* ‘pack camel’. This leads morphologists who observe the above distributional criterion to deny that *jarʲmʲn-* is a constituent of *jarʲmʲnikʲ* and to analyze this noun as denominal, motivated by the noun *jarʲm-* ‘yoke’ via the compound suffix *-ʲnik-*, thus

⁵⁴ This is set forth in more detail in Gladney 1984.

⁵⁵ The need to distinguish synchronic motivation from derivation, in the diachronic, etymological sense, is emphasized by Vinokur (1946/1959).

⁵⁶ Aronoff (1976:89) derives *nominee* from *nominate* with the truncation of *-ate*. Isačenko (1972) makes extensive use of truncation, e.g., the truncation of the adjective suffix /#n/ in the derivation of *uspokóit* ‘to calm’ from *spokójnyj* ‘calm’ (104).

[_N [_N /jarɨm/] [_N /ɨnik/]]. But if we consider an adjective to be an adjective even if it occurs only within a noun, we will analyze *jarɨtnik* as [_N [_A [_N /jarɨm/] [_A /ɨn/]] [_N /ik/]], a noun containing an adjective containing a noun. AG80 (231–236) is strict in applying motivation by words. For example, it claims *zaréč'e* ‘area across the river’ is derived from the noun *reka* ‘river’ by simultaneous prefixation and suffixation, rejecting a derivation from the phrase *za rekoj* because a phrase is not a word. The Polish Academy Grammar (392–396) is more liberal here: it recognizes dephrasal nouns, e.g., *przedmieście* ‘suburb’ (cf. *przed miastem*) and *bezdroże* ‘wilderness’ (cf. *bez drogi*).

Branching rules and conversions. The sublexical phrase-structure rules that generate suffixed words have the form $X \rightarrow Y X$ with X and Y standing for N, A, or V. The rightmost stem constituent is understood to be a noun, adjective, or verb suffix, not a noun, adjective, or verb, because only suffixed words are being considered here, ignoring word compounds like *milosrɨdyi* ‘merciful’. The words so generated are all right-headed. The rule schema generates nine possible word structures: denominal nouns ([_N N N]), deadjectival nouns ([_N A N]), deverbal nouns ([_N V N]), denominal adjectives ([_A N A]), deadjectival adjectives [_A A A], deverbal adjectives ([_A V A]), denominal verbs ([_V N V]), deadjectival verbs ([_V A V]), and deverbal verbs ([_V V V]). In addition to branching rules there are conversions, which have the form $X \rightarrow Y$. Possible conversions are $N \rightarrow A$, $N \rightarrow V$, $A \rightarrow N$, $A \rightarrow V$, $V \rightarrow N$, and $V \rightarrow A$, which generate deadjectival nouns ([_N A]), deverbal nouns ([_N V]), denominal adjectives ([_A N]), deverbal adjectives ([_A V]), denominal verbs ([_V N]), and deadjectival verbs ([_V A]). Not all these word structures necessarily occur in Slavic. There are also branching rules involving P (preposition / prefix), discussed below. Branching words in which Y and X are the same category are problematical because it is not obvious on the surface which one is head. So let us look first at [_X Y X] words where Y and X are different categories.

Deadjectival nouns include *istina* ‘truth’, *xromɨcɨ* ‘lame man’, *junica* ‘heifer’, *veličɨstvo* ‘greatness’, Bg. *vdovica* ‘widow’ and *vdovec* ‘widower’,⁵⁷ and *žénščina* ‘woman’. This last noun contains the adjective *žensk-*, which in turn contains a noun

⁵⁷ *Vdová* ‘widow’ is likewise deadjectival but is formed by conversion (below).

žen-, and is structured $[_N [_A [_N /žen/] [_A /#sk/]] [_N /in/]]$.⁵⁸ But AG80 (284) and Tixonov (1985:I, 343) analyze *ženščina* as morphemically simple, while *ženskij* for them is ‘womanish’, i.e., *ženščin-* plus *-sk-*, with *-ščin-* undergoing truncation. Their analysis is semantically based, on an unwillingness to have *ženskij* motivated by *žena* in the archaic sense ‘woman’. But semantic narrowing, as when ‘woman’ evolves to ‘X’s woman’, i.e., ‘wife’, is a common occurrence. In several Slavic languages it created the need for a new designation for ‘woman’. Polish found a different noun, *kobieta*, while Czech (*ženská*) and Serbo-Croatian (*ženska*) like Russian resort to the suffix */#sk/*. Russian makes it unambiguously a noun by adding the suffix */in/*.⁵⁹

Deverbal nouns. Deverbal nouns may be illustrated by *tolčók* ‘shove’, Po. *jeździec* ‘rider’, Slk. *mazuľa* ‘dirty-faced girl’. In *сѣpletъкъ* (*slovesъ*) ‘weaving (of words)’ and Po. *pobijak* ‘mallet’ the V constituent has been expanded to P V.

There is a large and productive class of nouns headed by the neuter DC-O suffix */ij/* preceded by */n/* or */t/*. Having classified */n/* and */t/* as adjective suffixes which occur in passive participles, it would follow that we analyze *сѣпасениѣ*, as in *izvoli vѣplotiti sje sѣpaseniѣ radi člověčьska* ‘deigned to become incarnate for the sake of human salvation’, as deadjectival, as well as forms like *padenije* ‘fall’, *pospěšenija* ‘assistance’, and *ętije* ‘seizing’, which abound in OCS texts. But *сѣпасениѣ* here is active in meaning, not passive as in *bo ,detъ сѣпасенъ* ‘will be saved’.⁶⁰ Semantically, *сѣпасениѣ* appears to be motivated by *сѣpas-* rather than by *сѣpasen-*. But even bereft of meaning, *-en-* must be accounted for. Rather than say the nominalization of a verb with the suffix */ij/* requires that it first be included in an adjective, we may prefer to analyze *сѣпасениj-* simply as the result of $N \rightarrow V N$, thus $[_N [_V [_P /sѣ/] [_V /pas/]] [_N /ij/]]$, and regard */n/* the preceding */e/*

⁵⁸ I employ the */#/* representation of the fleeting vowel because of its familiarity, even though I believe lexical representations should consist only of segments which can be represented as bundles of phonetic features.

⁵⁹ A comparable development is seen in *pórox* ‘gunpowder’, where semantic narrowing (‘powder’ → ‘gunpowder’) created the need for a noun with the meaning ‘powder’—*porošók*. For Tixonov these two nouns are unrelated, and Russian interpretive dictionaries consistently define *pórox* as an ‘explosive substance’ (*vzryvčatoe veščestvo*), careful not to use the noun *porošók* and concede that *pórox* is after all a specific kind of *porošók*. Clearly, however, ‘gunpowder’ is structured $[_N /porox/ /#k/]$. This is an idiomatic morpheme combination: */#k/* with */porox/* does not mean ‘little’, it means ‘not gun-’.

⁶⁰ We are reminded of *-ing*, which in *the shooting of the deer* lacks the active meaning it has in *the shooting of the hunters*.

as the result of thematization.

But there are /ij/ nouns occurring in phrases that look like transforms of clauses, e.g., the last two words in *věstb bo ocь vašb ixže trěbuete přžde prošeniě vašego* ‘for your father knows what you need before you ask’. In Polish, *-nie/-cie* nouns (/ij/ is lost by contraction) are so common as the heads of clause equivalents that some grammarians⁶¹ include them in the paradigm of the verb.⁶² They show the [±PERFECTIVE] opposition and occur both with and without the *się* intransitive marker; thus ‘changing’ can be *zmienienie, zmienianie, zmienienie się*, and *zmienianie się*. Reflecting their noun property, they take genitive complements, not accusative. Polish constructions with *do* ‘to’ expressing a goal may be regarded as a new analytic infinitive, e.g., *zmusili go do oddania pieniędzy ~ oddać pieniądze* ‘they forced him into surrendering the money ~ to surrender the money’, although the grammaticalization of *do* is not as complete as that of *to* in English. As to how a phrase headed by a *-nije/-tije* (or *-nie/-cie*) noun might be represented as a clause, the noun suffix /ij/ would presumably be the head, like the infinitive suffix /ti/. The disposition and movement of the other constituents is a matter for syntax.

Denominal adjectives. Denominal adjectives include *львовъ* ‘lion’s’, *zmiinb* ‘snake’s’, *roganьskb* ‘pagan’, *gadьnb* ‘repulsive’, and *kъnežb* ‘ruler’s’. In this last form, which I analyze as $[_A [_N /kъnež/] [_A /j/]]$, AG80 (304) and the Polish Academy Grammar (431) do not recognize an adjective suffix but subsume the occurrence of root-final [ž] under morphophonemics. Sharing an adjective suffix with *zmiinb* is the adjective *svinb* ‘porcine’, which contains the noun /su/ ‘pig’. Owing to its exceptional CV form, this noun in early Slavic did not occur in unsuffixed noun forms. Instead, pigs were referred to with the deadjectival noun *svinija*, structured $[_N [_A [_N /su/] [_A /in/]] [_N /ij/]]$. In most modern Slavic languages, which lack an adjective /svin/ (i.e., lack adjective forms with the stem *svin-*), these two morphemes have coalesced into the noun /svin/ ‘pig’, which occurs in the adjectives like Po. *świński* ‘swinish’ and nouns like Bg. *svinar* ‘swineherd’,

⁶¹ Thus Jan Tokarski in Doroszewski (I.lxiv–lxxiii) but not in the Polish Academy Grammar (177).

⁶² In Gladney 1983a:134 I suggest that the productivity of *-nie/-cie* nouns is limited by its functions being pre-empted by verbal nouns lacking this suffix, e.g., *budowa* ‘construction’ and *prośba* ‘request’ in place of *budowanie* and *proszenie*. A Google search shows that the eight supposedly pre-empted *-nie* nouns that I list are all amply attested in current usage.

but does not occur in noun forms except with the suffix /ij/ (sometimes contracted). Russian, however, has the adjective forms *svinój*, *svinógo*, etc. Tixonov (1985:2.80) analyses them as denominal, via truncation from *svinijá*, but having rejected truncation we must recognize them as forms of the adjective /svin/.

Russian has a fair number of adjectives in *-skij* which share a root with a river name, e.g., *toból'skij* ~ *reká Toból*, *ómskij* ~ *reká Om*, or with a city name, e.g., *kúrskij* ~ *Kursk*, *novorossíjskij* ~ *Novorossíjsk*. In AG80 (141) *kúrskij* is said to be derived from (motivated by) *Kursk*, this being an instance of morpheme “superimposition” (*sovmeščenie*), where the /sk/ of *Kursk* and the /sk/ of *kúrskij* “coincide in one sound string”. This strikes me as the inability to decide whether the /sk/ belongs to *Kursk*, in which case *kúrskij* is structured [_A [_N /kursk/]] and is an instance of A → N conversion (see below), or belongs to *-skij*, in which case *kúrskij* is structured [_A [_N /kursk/]][_A /sk/] with the first /sk/ truncated by the second. But the /sk/ of *kúrskij* is an adjective suffix selecting adjective endings, while the /sk/ of *Kursk* is a noun suffix selecting noun endings. Nominal /sk/ derives historically from adjectival /sk/ in connection with the latter's ceasing to occur with short (predicative) endings. It has come to mean ‘city’, functioning like *-ton* (*Newton*, *Charlston*, *Edmonton*, etc.) and like *City* (*Kansas City*, *Jefferson City*, *Carson City*, etc.). In adjectives, the roots denoting these cities occur without /sk/. The city name occurs without /sk/ also in *kurjáne* ‘Kurskers’. In rejecting truncation as a phonological rule, I am not doubting the ability of speakers to coin shorter versions of words, e.g., *zav* for *zavédujuščij* ‘manager’, *memo* for *memorandum*, and so on.⁶³

Deverbal adjectives. Those with the suffixes /ntj/, /bš/, /l/, /m/, /n/, and /t/ are discussed above. The suffixes /bš/ and /l/ have in common their nonoccurrence in passive constructions. With stative verbs they sometimes produce synonymous forms; thus *pályj* ‘fallen’ and *ustarélyj* ‘obsolete’ are synonymous with *pávšij* and *ustarévšij*. In West Slavic /bš/ has fallen into disuse, and with stative (more broadly, intransitive) verbs /l/ has taken over its function. Corresponding to *minúvšij* ‘past’, *bývšij* ‘former’, *uvjádšij* ‘wilted’ we find Cz. *minulý*, Po. *były*, and Po. *uwiędły*. The disuse of active /bš/ in West

⁶³ The forms *dostoevskie (čtenija)* ‘(conference devoted to) Dostoevskij’ and *lèrmonovéd* ‘Lermontov expert’ contain shortened versions of the writers’ names.

Slavic has led to the use of /n/ and /t/ suffixes in active meanings. Polish has *spóźniony* ‘late’ corresponding to active *spóźnić się* ‘be late’, and Czech has *ochnutý* in the same meaning as *ochnulý* ‘stiff’.

Denominal Verbs. Verbs structured [V N V] are judged to be more numerous or less depending to whether or not the phonemes separating the noun from the verb ending are considered to be suffixes. In AG80 (333) the infinitive *boronít* ‘to harrow’ is said to be motivated by the noun *boroná* ‘harrow’ via the suffix /i/, which alternates with /Ø/ in present-tense forms. But viewing the /i/ following the root as thematic, we see these verb forms as instances of V → N conversion (see below). But /iz/ and /ir/ are suffixes. Not attested in early Slavic,⁶⁴ they were borrowed from the languages of Western European and continue to be highly productive for forming verb forms containing nouns, e.g., *bazíruet* ‘base’, Po. *etymologizuje* ‘etymologize’, S-Cr. *glazira* ‘glaze’. In Russian and Polish these suffixes are lexically specified for thematic /u/, which entails thematic /j/ in present-tense forms and thematic /a/ in past-tense forms, where it breaks into /ov/.⁶⁵ Descriptions of verbal inflection which do not recognize thematization classify /ova/ ~ /uj/ as a suffix.

Deadjectival Verbs. What was said about denominal verbs applies also to deadjectival verbs. Some, e.g., *realizúet* ‘realize’ and *aktivizíruet* ‘activate’, contain verbal suffixes. Others, e.g., *sladitʹ* ‘sweeten’, are suffixless conversions. In cases where the borrowed morphemes that precede /iz/ and /ir/ do not occur except before these suffixes, categorizing them as N, A, or V is based on meaning.

Denominal nouns. We turn next to [X Y X] words in which X and Y are the same category. Nouns of the form [N N N] are right-headed when the suffix expresses the semantic and grammatical features of the noun and the root supplies a specific characterization.⁶⁶ Thus in *rybarjʹ* ‘fisherman’ the suffix /arj/ makes this a masculine

⁶⁴ Neither Sadnik and Aizetmüller 1955 nor Obreška-Jabłońska 1968 list verbs ending in *-izovati* or *-irovati*.

⁶⁵ Or perhaps it is a thematic /ou/ which monophthongizes when tautosyllabic.

⁶⁶ Dokulil (1962:29–49) offers a thorough discussion of what he calls onomasiological categories. He writes: “The structure of onomasiological categories is basically binary. As a rule, the phenomenon to be conceptualized is first assigned to a definite conceptual class, which in a given language has its categorial expression, and then within this class is determined by a definite characteristic; the conceptual class enters into the onomasiological structure of the concept as the determined constituent, the onomasiological base,

DC-O noun meaning ‘one who’ and /ryb/ specifies it with a reference to fish. In *bratřstvo* ‘brotherhood’ the suffix /břstv/ makes this an abstract neuter DC-O noun and /bratr/ pins down its reference to brothers. The Polish Academy Grammar (pp. 320, 363) calls such nouns transpositional or mutational derivatives, since the suffixes in these examples transpose ‘fish’ to ‘one who’ and ‘brother’ to ‘-hood’. These noun structures, which are clearly right-headed, are contrasted in structure and in meaning with so-called modificational nouns, such as *děvica* ‘little girl’ and *graděcě* ‘town’, in which the root appears to be the head. I touch on nouns with this structure below.

Several types of denominal nouns commonly classified as modificational appear to be mutational (right-headed). Both AG80 and the Polish Academy Grammar classify as modificational nouns denoting the young of the species, e.g., *orlěnok* ‘eaglet’, Po. *kocię* ‘kitten’, and nouns denoting women, e.g., *učitel’nica* ‘teacher’, Po. *mówczyni* ‘speaker’. As regards reference, it is true that *orlěnok* refers to an eagle, *kocię* to a cat, *učitel’nica* to a teacher’, and *mówczyni* to a speaker’ (and I would not suggest that a female teacher or speaker is first and foremost a woman and only secondarily a teacher or speaker). But with regard to form, the suffix in each of these nouns determines its gender and/or declension class. Formal considerations likewise lead us to reject AG80’s classification of collectives like *mužič’ě* ‘peasants’ (cf. *mužik*) and singulatives like *goróšina* ‘a pea’ (cf. *goróx*) as modificational.

Another noun claimed to be modificational is *němka* ‘German (female)’. AG80 (200) and Tixonov (1985:I, 662) derive it from *němec* ‘German (male)’, which would assign it the structure $[_N[_N/nem\#c/]][_N/\#k/]$ with /#c/ undergoing truncation. I reject this analysis, as my phonology does not eliminate phoneme strings once they have been introduced into the sentence.⁶⁷ I view *němka* and *němec* as parallel in structure,

while the characteristic is the determining constituent, the onomasiological characteristic” (p. 29). AG80 (183) assigns nouns with this structure the meaning “bearer of an object-related characteristic”.

⁶⁷ In defense of truncation, Darden (1988) argues that since nouns in *-ec* denoting inhabitants of places show the same stress as adjectives in *-skij* referring to those places, not the stress of the base nouns that denote those places, the *-ec* nouns should be derived from the *-skij* adjectives via the truncation of the *-sk-* suffix. For example, *górec* ‘mountain dweller’ shows the stress of *górskej* ‘mountainous’, not that of *gorá* ‘mountain’. He writes (93): “The most natural way to account for the shift to presuffixal stress is to assume that the adjective, for which the shift is normal, is derivationally intermediate between the place name and the derivation in /-(e)c-/. He envisions “a metarule which creates derivational stems for nouns which are identical to those [for] the adjectives” (94), thus $[_N[_A/gor/\#sk/]][_N/\#c/]$ (as I would represent it). After /#sk/ conditions the placement of stress on /gór/, it is truncated. It is true that with many base nouns—Darden cites also *Tabúný*, *tabúnskij*, *tabúneć*; *Litvá*, *litóvskij*, *litóveć*; and other triplets—/#c/ has the same

[_N [_N /nem/] [_N /#c/]] and [_N [_N /nem/] [_N /#k/]]. For me they are structured the same as *kitáec*, *kitájka* ‘Chinese’, *irá nec*, *irá nka* ‘Iranian’, *evropéec*, *evropéjka* ‘European’. I thus categorize /nem/ as a noun, which is synonymous with the /german/ that occurs in *Germánija* and *germán skij*. It is related to the adjective /nem/ ‘mute’ only historically. Of course a noun /nem/ is not recognized in word-based morphology because it does not occur as the stem of noun forms.

Deadjectival adjectives. Deadjectival adjectives are possibly exemplified by *skvrъnavъ* ‘unclean’ (cf. *skvrъnъ* ‘idem’), *slabovátjy* ‘somewhat weak’ (cf. *slábyj*), *blizěxon’kij* ‘quite close’ (cf. *blíz kij*), *vysočájšij* ‘most high’ (cf. *vysókij*) (see AG80, 299–302), Po. *grubiutki* ‘chubby’ (cf. *gruby* ‘fat’), and others. All of these forms are root-headed, i.e., modificational, which makes them exceptions to right-headedness. In addition, adjectives like /bliz/ ‘near’, which occurs in both *blíz kij* and the comparative *blíže*, and /vys/ ‘high’, which occurs in both *vysókij* and in the comparative *vyše*, pose the problem, addressed below, of how to account for post-root /#k/ and /ok/.

Deverbal Verbs. AG80 (350) analyzes imperfectives like *opísyvát’* ‘describe’ as derived with the suffix -yva- from perfectives like *opísát’*. But many, although not all, Slavists regard *opíšu*, *opíšeš*, etc. and *opísyvaju*, *opísyvaeš*, etc. as inflected forms of the same verbal compound,⁶⁸ and as I have argued on a number of occasions,⁶⁹ the presence of a suffix in imperfective forms that is absent from perfective forms is incompatible with their being forms of the same [_V P V] compound and [±PERFECTIVE] being inflectional in Slavic. Deverbal verbs are discussed below under prefixation.

Conversion. Conversion is recategorization of the form $X \rightarrow Y$, whereby a lexical word of category Y occurs under a preterminal symbol of category X with no suffix.⁷⁰ For example, $N \rightarrow A$ makes it possible for an adjective to occur without a suffix

accentual affect on the noun root as /#sk/. But I think this fact should be associated with /#c/ directly. I see no need for interposing a suffix with the same accentual affect as /#c/, assigning the accent, and then truncating that suffix.

⁶⁸On the other hand, few Slavists would claim this of [_V V] ~ [_V P V] pairs, e.g., that in *napišet* ‘will write’ /na/ makes its appearance before /pis/ as a consequence of its occurring in a predicate phrase specified [+PERFECTIVE].

⁶⁹Most recently in Gladney 2001 (2004).

⁷⁰My syntactic conversions differ in direction from what Spencer (1991:105–19) calls morphological conversions. My $N \rightarrow A$ applies to a sentence structure [_S ... [_{NP} N] ...] to yield the sentence structure [_S ... [_{NP} [_N A]] ...]. Then a lexical rule, e.g., $A \rightarrow$ /tvъd/, applies, and thus the adjective /tvъd/ occurs in

in a noun form, e.g., *tvrьdbь* ‘strength’, *zelen’* ‘green’, and Po. *mlódz* ‘youth’. Noun forms like *tvrьdbь*, *tvrьdi*, *tvrьdbjo*, etc., pose the problem of how a noun consisting of a lexical adjective comes to be feminine and select DC-I noun endings. With a suffixed noun like *čьstь* ‘honor’, which is structured $[_N[_V/čьt/]] [_N/t/]$, these features can be associated in the lexicon with the noun suffix /t/. But in the absence of a suffix the features [FEM] and [DC-I] must be accounted for some other way. Perhaps as follows: the sentence constituent $[_N[_A/tvrьd/]]$ bearing the syntactic features [-PLUR] and [GEN] undergoes an ending segmentation transformation which creates the stem-ending structure $[_N[_A/tvrьd/]]E$. This transformation must be formulated to assign to E not only the features [-PLUR] and [GEN] but also [FEM] and [DC-I]. The adjective category of /tvrьd/ is crucial for the operation of this rule, because when the word within the noun is a verb, as in *xodь* ‘movement’, *сьль* ‘messenger’, *prilogь* ‘addition’, *сьвоць* ‘fetter’, etc., the segmentation transformation creates an ending constituent with the features [MASC] and [DC-O].⁷¹

The rules just proposed make suffixless deadjectival nouns [FEM, DC-I] and suffixless deverbal nouns [MASC, DC-O]. There are exceptions, e.g., *poxóda* ‘walk’, which is structured $[_N[_V P V]]$ the same as *prilogь* and *сьвоць* but is [FEM, DC-A]. Nevertheless, a dozen and a half [FEM, DC-I] nouns in Russian are accounted for, such as *dal’* ‘distance’, *tiš’* ‘quiet’, *žut’* ‘terror’, and *glub’* ‘depth’. The nearest thing to an exception is *dliná* ‘length’ (*dlin’* is dialectal). There is also the problematic *vdová* ‘widow’, next to the adjective *vdóvyj* ‘widowed’. Tixonov (1985:I, 143) claims that the

the noun form *tvrьdbь*. Morphological conversion employs a lexical process $A \rightarrow N$, which converts the adjective /tvrьd/ to the [FEM, DC-I] noun /tvrьd/, which thus becomes available for insertion in the sentence environment $[_S \dots [_{NP} N] \dots]$.

A variant account discussed by Spencer (184–85) analyzes lexically converted deadjectival nouns like /tvrьd+Ø/, with the grammatical features [FEM] and [DC-I] associated with the zero suffix. Zero suffixes plus constituent structure figure in Spencer’s explanation (185) for why *grandstanded*, a verb derived from a noun derived from a verb, shows the weak past-tense inflection, although *withstood* shows the strong-verb inflection. In *grandstanded* the ending is separated from the stem by suffixal Ø’s and the constituent structure which they mark. A Slavic parallel is provided by *navóžu* ‘I fertilize’. This denominal verb shows fixed A accent, while the related verbs, impfv. *navožú*, *navóžit* and pfv. *navezú*, *navezět* ‘bring (a quantity of)’ show B and C accent respectively. I think both the weak conjugation of *grandstanded* and the A accent of *navóžu* can be explained by the $[_V[_N[_V V]]]$ bracketing created by recategorization, without positing zeroes. Zeroes are employed also by Isačenko (1972).

⁷¹ In individual cases ablaut is also involved, e.g., $[_N[_V/vez/]]$ surfacing idiomatically as *vozь* ‘wagon’. Also involved is reaccentuation, for example when $[_N[_V bred/]]$, which contains an unaccented (C) verb (cf. *bredú*, *breděš’*), surfaces as an accented (A) noun: *bred*, *bréda* ‘delerium’.

latter is a denominal adjective, structured $[_A [_N /vdov/]] [_A \emptyset]$. Foregoing the use of ghost suffixes, we must rather see the noun as deadjectival, thus $[_N [_A /vdov/]]$, with the gender a feature of the N under which it occurs and declension class predictable from the gender.

$A \rightarrow N$ conversion is rare. It occurs in *žerěbaja* (*kobýla*) ‘(mare) in foal’, which contains the noun /žereb/, occurring also in the suffixed noun form *žereběnok* ‘foal’ and in the verb form *žerebilas* ‘foaled’. It also occurs in *porósaja* (*svin’já*) ‘gestating (sow)’. Next to these structurally rare adjectives we find also *suporósaja* ‘idem’ and *sujágnaja* (*ovcá*) ‘gestating (ewe)’, which have a prepositional phrase in the root position (see below). Whether $A \rightarrow N$ is involved in *zlata* (*struja*) ‘golden (stream)’ is unclear: /zlat/ could be a lexical adjective and the noun form *zlato* ‘gold’ could be a case of $N \rightarrow A$, like *dobro* ‘good’ and *zlo* ‘evil’. As for $A \rightarrow V$, I am not aware of any unsuffixed adjective forms in Slavic containing lexical verbs. Perhaps *pokátj* ‘sloping’.

$V \rightarrow N$ and $V \rightarrow A$ conversions are common. The former applies in *běditь* ‘coerces’, structured $[_V [_N /běd/]]$, and the latter in *gladitь* ‘smooths’, structured $[_V [_A /glad/]]$. However, not every $[_V N E]$ and $[_V A E]$ verb form shows thematic /i/ between root and ending. We also find verb forms like *glasujetь* ‘calls’ and *opravьdajetь* ‘will justify’, which are similarly structured $[_V [_N /glas/]]$ and $[_V [P /ob/]] [_N /pravьd/]$ respectively but which are thematized differently. The situation is complicated by the fact that the same noun occurring in a verb form may call for various thematizations; for example, we also find *glasitь* and *opravьditь*. But not every thematization is equally productive for denominal verbs in every Slavic language. Thus /a/ thematization is unproductive and the nouns calling for it can be reduced to a list. But both the /i/ and the /u/ thematizations are productive, so either some syntactic or semantic criteria for their distribution in the various Slavic languages must be found or, in the worst case, individual nouns and adjectives have to be specified in the lexicon for what thematization they take when occurring in verb forms.

Early texts attest a verb form *věrьstvujemь* ‘we believe’, which appears to be an instance of $V \rightarrow N$ conversion containing the suffixed noun $[_N [_N /věr/]] [_N /ьstv/]$, although it is not attested in a noun form. *Věrьstvujemь* is synonymous with *věrimь*, which suggests that the abstract suffix /ьstv/ is semantically depleted. I incline toward the view that a morpheme which undergoes semantic depletion in certain environments is

still that morpheme. But some would argue that a meaningless /ʎstv/ which moreover does not form a noun stem is not a morpheme, and that therefore *věrvstvujemʎ* and its ilk are formed with the compound verbal suffix /ʎstvova/.⁷²

Russian, besides hundreds of sets of verb forms like *registrátorstvuet* ‘work as a registrar’ (in the absence of **registrátorstvo* ‘registrardom’), has an equal number like *bezdél’ničacet* ‘loaf’. For *bezdél’ničacet*, which shows the thematic elements /a/,⁷³ /j/, and /e/, exceptionally all of the constituents occur as word forms: *bezdél’nik* ‘loafer’, *bezdél’nyj* ‘idle’, and *bez del* ‘without anything to do’. More often they do not. In *lakejničacet*, the [N_[A/#n/]][N_[ik/]] constituent is semantically depleted, since this form means ‘behave like a lackey’, not ‘behave like one who has to do with lackeys (**lakejnik*)’. *Bábničacet* has readings both with and without the semantic depletion of [N_[A/#n/]][N_[ik/]], since it means both ‘behave like a woman (*baba*)’ and ‘behave like a womanizer (*babnik*)’.

Intranominal conversion. There are nouns in Slavic that vary in animacy. In Russian, for example, we find (*otesát’*) *bolván* ‘(shape) a stump’ next to (*obmanút’*) *bolvána* ‘(deceive) a blockhead’, where the difference in animacy explains the application or nonapplication of the Genitive–Accusative Rule (which switches [ACC] to [GEN] when it combines under the same sentence node with certain other features of the noun). This variation is especially common with nouns having suffixes denoting either agents or instruments, e.g., *rezák* ‘one who or that which cuts’, *podbórščik* ‘one who or that which sorts’, and so on. The lexical (also lexicographical) way of handling this variation is to recognize grammatical homonyms, pairs of [MASC] nouns differing by the feature [±ANIM]. To avoid this lexical proliferation, we might make [±ANIM] available to the phrase-structure rule that introduces the category N. A lexical noun inserted under an N specified [+ANIM] acquires this feature and in [ACC] environments is inflected accordingly. With a [DC-A] noun, as in (*pomnili gorodskogo*) *golovú* ‘(they remembered) the mayor’, the [+ANIM] feature of the noun is reflected not in the noun

⁷² AG70 (755–759) offers a useful reverse-alphabetized index of suffixes, including *-stvova(t’)* and *-ničac(t’)*.

⁷³ More abstractly, /ě/, with a -back, +low vowel. But we are not concerned here with phonology.

ending but in the agreeing adjective.⁷⁴

Under a [+ANIM, +HUMAN] N, nouns may occur which are sometimes masculine, sometimes feminine. The early Slavic lexicon contains the [+ANIM, +HUMAN] noun /rab/ ‘slave’ which occurs as the [MASC, DC-O] noun forms *rabъ*, *raba*, *rabu*, *rabi*, *raběxъ*, etc. and also as the [FEM, DC-A] noun forms *raba*, *rabu*, *raboxъ*, etc. This is true also of Ru. /suprug/ ‘spouse’ and Slk. /sused/ ‘neighbor’.⁷⁵ If we held fast to the principle that lexical gender is an inalienable property of nouns, distinguishing them from adjectives, we would need to recognize grammatical homonyms, i.e., include in the lexicon a [FEM] /rab/ which selects [DC-A] endings in addition to a [MASC] /rab/ which selects [DC-O] endings. This takes care of the mechanics of inflection but at the cost of much redundancy in the lexicon. The redundancy is greatly increased in the modern Slavic languages, for example, in the many cases where the forms of women’s last names differ in regular ways from those of their male relatives, e.g., in the case of a Ms. Borodina and a Mr. Borodin. The alternative is to make the features [FEM] and [MASC] (or a feature [±FEM]) available to the phrase-structure rules which introduce the category N, when it is specified [+ANIM] and [+HUMAN]. Making [±FEM] available to the phrase-structure rules would provide a syntax-internal way of differentiating between *ty uměn* ‘you are smart’ (said to a male) and *ty umná* ‘idem’ (said to a female). It is also needed to account for *Olja umnaja* ‘Olga is an intelligent woman’ (mentioned above), where the occurrence of the attributive ending *-aja* is conditioned by an unlexicalized [+FEM] predicate N.

Prefixation. The most common prefixation is verbal, when a sublexical phrase-structure rule expands V to [_v P V] and the P is lexicalized. Prefixes are grammatically simpler than suffixes because they do not affect the category of the morpheme they

⁷⁴ Citing facts like these, Mel’čuk (1980) argues that adjectives agree with their nouns heads not only for case, number, and gender but also for animacy. This was pointed out earlier by Zaliznjak (1977:6).

Beard (1995:72) proposes replacing the [ANIM] feature with what he calls (Natural) Gender, which has something to do with the referent having sex organs and is defined by the features [±Masculine] and [±Feminine], with a special interpretation of “±”. I cannot claim a full understanding of Beard’s proposal, but I do not see how he can account for the genitive accusative form in (*oná izučáet nasekómyx* ‘(she studies) insects’ without the [+ANIM] feature.

⁷⁵ In Spanish, /tih/ can occur both in masculine noun forms meaning ‘uncle’ and feminine noun forms meaning ‘aunt’. In Modern Greek /adelf/ can occur both in masculine noun forms meaning ‘brother’ and in feminine noun forms meaning ‘sister’.

precede. A $[_X P X]$ is always an X, and in a $[_V P V]$ construction the verb has the same thematization as it does in $[_V V]$. It is important for aspect morphology that prefixed verbs have the articulated structure $[_V P V]$, because in a [-PERFECTIVE] sentence environment a $[_V P V]$ compound undergoes imperfectivizing thematization while a simple $[_V V]$ does not. Aspectually regular verb compounds like $[_V [P/o/] [_V /pis/]]$ must be so structured to distinguish aspectually regular /pis/ from verbs like /da/ ‘give’, /bros/ ‘throw’, and /liš/ ‘deprive’, which are aspectually exceptional in being able to occur in [+PERFECTIVE] sentence environments without a prefix.⁷⁶

The structure of prefixes. A bimorphemic word can be structured only one way— $[_W A B]$ —the only question being whether A or B is the head. But a word comprising three morphemes can be structured either $[_X A B] C$, the result of X being expanded as A B, or $A [_Y B C]$, the result of Y being expanded as B C. For example, a verb with two prefixes can be structured either $[_V [P P P] V]$, as the result of a $[_V P V]$ compound being expanded $P \rightarrow P P$, or it can be structured $[_V P [_V P V]]$, as the result of $[_V P V]$ being expanded $V \rightarrow P V$. An example of a $[_V [P P P] V]$ verb form is *priotkróet / priotkryváet* ‘open slightly’, where the compound prefix $[_P [P/pri/] [_P /ot/]]$ functions aspectually the same as the simple /ot/ in *otkróet / otkryváet* ‘open’. An example of a $[_V P [_V P V]]$ verb form is *pootkryváet* ‘open (several things one after another)’, where /po/ has the same aspectual function vis-à-vis $[_V [P/ot/] [_V /kry/]]$ as /ot/ has in *otkróet*.

Prepositional phrases. Prepositional phrases (PPs) may occur as the roots of suffixed nouns and adjectives as the result of the base rules $N \rightarrow PP N$ and $A \rightarrow PP A$. Sublexical PPs are generated by the base rule $PP \rightarrow P N$ (contrasting with the supralexic rule $PP \rightarrow P NP$). Examples are *besmr̂tije* ‘immortality’, which is structured $[_N [PP [P/bez/] [_N /smr̂t/]] [_N /ij/]]$, and *besmr̂tʹnʹ* ‘immortal’, which is structured $[_A [PP [P/bez/] [_N /smr̂t/]] [_A /ʹn/]]$. Russian examples are *perelésok* ‘coppice’, structured $[_N [PP [P/pere/] [_N /les/]] [_N /#k/]]$ (/pere/ is an example of a preposition that occurs sublexically but not supralexically), and *sverxsróčnyj* ‘beyond the set term’, which is structured $[_A [PP [P/sverx/] [_N /srok/]] [_A /#n/]]$. Other PP-rooted

⁷⁶ The [-PERFECTIVE] thematization of $[_V P V]$ compounds may pose a problem for Scalise’s (1988:575) Atom Condition, which predicts that “the attachment of an inflectional morpheme never depends on the presence of a prefix”, although imperfective thematization does not involve a morpheme.

adjectives are *obnoštʹnʹ* ‘all-night’, *predmájskij* ‘leading up to May 1’, and Slk. *podnožný* ‘foot’.

Prepositional phrases (PPs) may occur as the roots of suffixless nouns and adjectives as the result of the conversions $N \rightarrow PP$ and $A \rightarrow PP$. Examples of nouns structured $[_N PP]$ are *otʹjadʹ* ‘antidote’, *bezʹdna* ‘abyss’, and *Pribáltika* ‘Baltic republics’. The gender and declension class of such suffixless nouns are often that of the noun root. Examples of adjectives structured $[_A PP]$ are ORu. *bezrukii* ‘one-armed’ and Po. *bezbrody* ‘beardless’. I hesitate to assign this structure to *ubogʹ* ‘poor’ and *sugúbnyj* ‘twofold’ because this may be crossing the border between synchronic structure and diachronic etymology (which border, however, is not clearly marked).

Not every P-initial noun and adjective structures the P as a preposition. *Perenósica* ‘bridge of the nose’ does, since /pere/ and /nos/ constitute a PP (this noun means ‘that (-ic-) which stretches across (pere-) the nose (-nos-)’). But *perešéjka* ‘isthmus’ does not; it does not mean ‘something (-k-) which stretches across (pere-) the neck (-šej-), but rather ‘a neck (-šej-) of land, comparatively small (-k-), which stretches across (pere-)’. Since /pere/ has no complement, it may be classed as an adverb. Adv(erb) has as good a claim to being the fourth part of speech as P, since it differs from P only distributionally, an adverb being a preposition without a complement, a preposition an adverb with one. An adjective in which the P is adverbial is *sverxsróčnyj* in the sense ‘very urgent’.⁷⁷ Although /bez/ occurs supralexically only as a preposition, it is adverbial in *bezčelověčnyj*, which is structured $[_A [_P /bez/] [_A [_N /čelovek/]] [_A /#n/]]$ meaning ‘inhuman’, not $[_A [_PP [_P /bez/] [_N /čelovek/]]] [_A /#n/]]$ meaning ‘lacking a human being’.⁷⁸

Likewise with suffixless P-initial nouns and adjectives, some have PP roots and are thus exocentric, while in others the P is adverbial and the stem is endocentric with respect to the noun or adjective root. Clearly endocentric are *razvesělyj* ‘very cheerful’ and Po. *przysłaby* ‘somewhat weak’, which are structured $[_A P A]$, and *praotʹcʹ* ‘forefather’, *prízvuk* ‘additional sound’, *podvíd* ‘subspecies’, *podotdél* ‘subsection’, and

⁷⁷ Comparable preposition/adverb contrasts occur in English, e.g., in *supersensible* ‘above that which is apparent to the senses’ vs. *supersensitive* ‘extremely sensitive’.

⁷⁸ For more discussion of three-morpheme stems in Russian and how they are analyzed in Tixonov 1985, see Gladney 1986.

Bg. *pódkum* ‘groomsman’ which are structured [N P N]. Some forms are structurally and semantically ambiguous: is *prigorod* dephrasal (exocentric) meaning ‘settlement located near a city’, or is it endocentric with regard to the noun root?⁷⁹

In early Slavic, dephrasal nouns with the [-COUNT] suffix /ij/ are abstract, e.g. *besramije* ‘shamelessness’; those with the [+COUNT] suffix /ьk/ are concrete, e.g., *besramьkь* ‘shameless person’. This is mostly true also in Russian, where *bezúmie* ‘madness’ and *pričástie* ‘communion’ are [-COUNT] and *mežeúmok* ‘something hard to classify’ and *učástok* ‘parcel’ are [+COUNT]. This semantic opposition may be discerned also in the nouns *podlés’e* and *podlésok*, both of which refer to a stand of small trees adjacent (*pod*) to a forest (*les*). But the fact that /#k/ occurs stem-finally in many diminutive masculine nouns opens the door to semantic contamination. The 17-volume Academy dictionary gives a second definition of *podlésok*, which is ‘sparse stand of short trees (*lesók*), usually adjacent to a forest (*k lesu*)’. If small size has replaced adjacency to a forest as criterial in the meaning of *podlésok*, this noun may have been semantically restructured, from dephrasal [N [PP [P /pod/] [N /les/]] [N /#k/]] to endocentric [N [P /pod/] [N [N /les/]] [N /#k/]]].⁸⁰ However, the structure of a putative [N [N /les/]] [N /#k/]] constituent, as well as of the noun *lesók* (note difference in stress), calls for some discussion (next section).

Items vs. processes in word formation. I have assumed that words in Slavic are right-headed with the suffix determining the category of the word and organizing its semantic structure. This is clearly the case with nouns in which the suffix denotes the bearer of the characteristic denoted by the root, e.g., *rybarjь*, which means ‘one (-arj-) who is defined by his relationship to fish (*ryb-*)’. It is clearly not the case with *rybica*, which denotes a fish, not a something (-ic-) which has to do with fish. Nouns like *rybica* suggest either that suffixed nouns in Slavic is not always right-headed or else that the phonemes that occur between the (morphemes constituting the) root of a word and the ending do not always represent a suffix. In the latter case, there is reason to question the assumption that has underlain my discussion of word-formation so far, namely, that

⁷⁹ Likewise in English, while *at-home* is clearly exocentric, denoting a reception, not a home, *undershirt* is less clear in structure: is it exocentric, denoting something (unspecified) that a gentleman wears under his shirt, or is it endocentric, denoting a kind of shirt?

⁸⁰ These issues are discussed in Gladney 1973.

words, as one writer puts it, “consist of (phonological) pieces organized in hierarchical tree structures, like syntactic structures” (Marantz 1992:413), and we might entertain that writer’s alternative, namely, that words are “built via phonological operations of word formation on stems marked with syntactic, semantic, and morphological features”. The discussion so far has recognized both items (morphemes arranged in tree structures) and processes (thematizations). Thematizations introduce phonemes between morphemes, so they are not phonological operations in the strict sense of phonetic-feature changes. But neither are they morphological operations in the sense of lexical insertion of morphemes.

The distinction between thematic elements and morphemes in Slavic is not clear-cut and subject to diachronic change. The shifting status of phoneme strings separating root from ending may be illustrated with adjective forms terminating in the sg. masc. nom. form in *-ькѣ*. On the one hand we have *plъzъkѣ* ‘slippery’ and *vratъkѣ* ‘fickle’. They have verb roots (cf. *plъzati* ‘to crawl’, *vratiti se* ‘to turn’), which allows us to analyze them as [_A V A], headed by the adjective suffix /ѣk/. In Russian, verb-rooted adjective forms headed by the suffix /#k/ are a productive formation. On the other hand the adjectives /glad/ ‘smooth’, /slad/, ‘sweet’, and /o_z/ ‘narrow’ likewise show terminal *-ькѣ* in sg. masc. environments (*gladъkѣ*, *sladъkѣ*, *o_zъkѣ*). These forms, however, appear to be headed by their adjective roots, as /ѣk/ lacks the recategorizing function it has in *plъzъkѣ* and *vratъkѣ*. Since most of the polymorphemic words we have examined so far are right-headed, it is difficult in such cases to give /ѣk/ morpheme status. Moreover, /ѣk/ does not occur in other syntactic environments, e.g., in *gladitъ* ‘smoother’, *slazde* ‘sweeter’, and *úzost’* ‘narrowness’. AG80’s approach is to regard (the Russian counterparts of) /gladъk/, /sladъk/, and /o_zъk/ as lexical, with the last two phonemes truncated in some environments, something my phonology does not allow. I think our task is to account for /ѣ/ and /k/ where they occur, not for their absence where they don’t.

Comparative evidence shows that in pre-Slavic /glad/, /slad/, and /o_z/ were so-called *u*-stem adjectives, which means there were thematized for /u/ (= Slavic /ѣ/) in the environment [_A /glad/ __ E] (cf. Lith. sg. masc. nom. *glodùs* ‘close-fitting’). Declension Class U for adjectives was unproductive, and at some stage in pre-Slavic *u*-stem adjectives were regularized, switched to Declension Class O (for masculine and neuter),

with the intercalation of /k/.⁸¹ Recognizing this fact, Slavists traditionally segment forms like *gladъкъ* as *gladъ-kъ-(s)*, not as *glad-ъk-ъ*, showing post-root *ъ* (< **u*) to be the thematization of /glad/ (except of course in verb forms like *gladitъ* or comparative forms like *glažde*), whereas pre-desinential *ъ* (< **o*) is the productive thematization conditioned by /k/. How the pre-Slavic sg. masc. nom. form [_A [_A /glad/] /u/ /k/ /o/ [_E /s/]] is generated, by what sequence of thematizations, is not clear. Perhaps first for the productive theme /o/, then for the /k/ which conditions it, then for the lexically conditioned /u/. In any case it is clear that the phonemes separating the adjective from its ending did not constitute a morpheme. And likewise in modern Slavic, e.g., in *blízkiĭ* ‘close’, *gládkij* ‘smooth’, *korótkij* ‘short’, *nízkiĭ* ‘low’, *rédkiĭ* ‘rare’, *sládkij* ‘sweet’, *tónkiĭ* ‘thin’, *úzkij* ‘narrow’, and *žídkij* ‘watery’, where /#k/ is not reflected in the comparative form, it appears that /#/ and /k/ do not constitute a morpheme. Perhaps they are introduced by thematization rules. Note that where /#k/ is present also in the comparative, e.g., *zvónko* ‘ringing’ ~ *zvonče*, it is a morpheme and the head.

Lexical gender, the defining feature of nouns, gives us a criterion for distinguishing between noun suffixes, which are morphemes, and sequences of phonemes which could be introduced into noun forms by readjustment rules (thematizations). In deverbal *ostanъкъ* ‘remainder’, deadjectival *četrъtъкъ* ‘Thursday’, and dephrasal *besramъкъ* ‘shameless person’, /ъk/ is a masculine DC-O suffix. Similarly in *némka* ‘German (woman)’ and in deverbal *pryžók* ‘a jump’ /#k/ is, respectively, a feminine DC-A and a masculine DC-O suffix. But in modern Slavic diminutive noun forms stem-final /#k/ lacks fixed gender; thus diminutive *kusók* ‘little piece’ is masculine the same as *kus*, *óblačko* ‘little cloud’ is neuter the same as *óblako*, and *šéjka* ‘little neck’ is feminine the same as *šéja*. This is true also of stem-final /#c/: *brátec* ‘(dear) little brother’ is masculine the same as *brat*, *vincó* ‘(nice) little wine’ is neuter the same as *vinó*, and *dvercá* ‘little door’ is feminine the same as *dver*. The prospect of handling diminutive forms like these with thematization rules, which insert one phoneme at a time, is improved when we view /#k/ and /#c/ as sharing a /k/ and differing only by the /#/, which in the case of palatalized -c- would be represented less abstractly as a +high, -back vowel.

⁸¹ The switch of *u*-declension adjectives to the productive *o*-declension through the introduction of thematic /k/ parallels the switch of the athematic verb /ei/ ‘go’ to the thematic conjugation through the introduction of thematic /d/; compare athematic Gk. *eîmi* ‘I (will) go’ with *ido* ‘idem’.

Representing /#/ as an actual vowel, which when -back palatalizes both fore and aft, might explain why as diminutives for ‘brother’ Russian has *bratók* but no **bratěk*, *brátec* but no **brátek*. However, longer phoneme strings occurring in diminutive noun forms, e.g., *izb-úšk-a* ‘little hut’, could be more recalcitrant to a thematization approach.

Then there are the diminutive adjective forms that were mentioned earlier: *slabovátyj* ‘somewhat weak’, *blizěxon’kij* ‘quite close’, Po. *grubiutki* ‘chubby’, and others. These forms are root-headed, so that to maintain that polymorphic words in Slavic are all right-headed we may consider denying morpheme status to the phoneme strings spelled *-ovát-*, *-ěxon’-* and *-iut-*. If this proves to be defensible, we will have established parallel thematizations in all three major word classes, realizing diminution in nouns (*kus* ~ *kusók*) and adjectives (*slábyj* ~ *slabovátyj*) and imperfectivization in verbs (*opisála* ~ *opisyvala*).

In conclusion, the facts of Slavic morphology can for the most part be accounted for with the familiar devices of phrase-structure rules, applying also sublexically, and lexical insertions. All combining of morphemes may be seen as taking place in the sentence, with nothing happening in the lexicon. Morphemes are lexical sound-meaning pairings, their abstractness only phonological. Inflection differs from word-formation in involving segmentation rules which adjoin ending categories to words. Thematizations, readjustment rules that introduce phonemes between morphemes, play a major role in Slavic morphology, a role not yet fully delimited.

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