Category-specific effects

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1. Introduction

The lexical categories *noun, verb,* and *adjective* are traditionally distinguished by means of distributional (syntactic) and morphological criteria. But in some languages, lexical categories also have distinct phonological behavior. This point has been discussed by Cohen (1964), Postal (1968), Kenstowicz & Kisseberth (1977), Smith (1997, 2001), Myers (2000), and Bobaljik (2008), among others. However, the cross-linguistic typology of phonological differences among lexical categories has not received much systematic investigation.

This chapter surveys category-specific phonological effects, identifying generalizations or patterns where possible. Noun/verb differences are discussed in §2, and the behavior of adjectives is examined in §3. Alternatives to allowing the phonological grammar to refer to category are discussed in §4, but none of them captures all category-specific effects.

2. Nouns versus verbs

This section examines the basic distinction between nouns and verbs. (Adjectives, which seem to pattern as an intermediate category, are discussed in §3.)

The examples are organized according to which category shows greater phonological privilege: nouns (§2.1-2), verbs (§2.3), or neither (§2.4). Here, *phonological privilege* is understood to mean the ability to support a greater array of phonological contrasts, whether this is manifested as a larger number of underlying distinctions, more variety in surface patterns, or a greater resistance to assimilation or other phonological processes (though see §2.2 for additional considerations). Within each section, examples are classified by type of phonological phenomenon. To preview the results (§2.5), noun privilege is the most common pattern, with a few cases each of verb privilege or distinct noun and verb requirements. Prosodic and suprasegmental phenomena are much more common than segmental or featural phenomena.

2.1 Phonological privilege in nouns

In the examples discussed here, nouns show greater phonological privilege than verbs. The phenomena range over suprasegmental and prosodic effects; no straightforward segmental or featural cases of noun privilege have been identified.

2.1.1 Stress, accent, tone

In Spanish (Romance), stress location is contrastive for nouns but not for verbs (Harris 1983; Garrett 1996). Nouns have stress on the antepenultimate, penultimate, or final syllable; near-minimal pairs exemplifying antepenultimate and penultimate stress are shown in (1a). Verbs may appear with penultimate or final stress, but the stress location is determined by the verb's inflectional affix.

(1)   Stress location in Spanish

   (a)   Nouns: contrastive stress (data from Castillo & Bond 1948; Solá 1981)
       Antepenultimate   *Penultimate*
       [sáβana]   'sheet'   [saβána]   'savanna'

       [káskaɾa]   'husk'   [kaskáða]   'waterfall'

       [tóɾtola]   'dove'   [toɾtúɣa]   'turtle'

       [bíspeɾa]   'eve'   [espéɾa]   'wait'

   (b)   Verbs: stress determined by inflection (data from Garrett 1996: 72-73)
       [láβ-o]   'wash-1SG.PRESENT.INDIC'   [laβ-é]   'wash-1SG.PRETERITE.INDIC'

       [láβ-a]   'wash-3SG.PRESENT.INDIC'   [laβ-ó]   'wash-3SG.PRETERITE.INDIC'

Modern Hebrew (Semitic) has a similar pattern; nouns have stress contrasts, but verb stress is predictable (Becker 2003).[1]

   A case resembling Spanish, but for pitch accent, is Tokyo Japanese (Japonic; McCawley 1968). In nouns, accent location is contrastive. Accent, realized as a pitch fall, may appear on any syllable, and there are minimal sets among disyllabic nouns. For verbs, there is a contrast between accented and unaccented stems, but the accent location is determined by the affix category. (The principles governing verb accent location are complex; see McCawley 1968.)

(2)   Pitch-accent location in Tokyo Japanese (data from Hirayama 1960)

   (a)   Nouns: accent location and presence/absence both contrastive
          (*-ga* marks nominative case; included to distinguish final accent from unaccented)

Initial accent		*Final accent*		*Unaccented*	
[háʃi-ga]	'chopsticks'	[haʃí-ga]	'bridge'	[haʃi-ga]	'edge'
[káki-ga]	'oyster'	[kakí-ga]	'fence'	[kaki-ga]	'persimmon'
[kíbi-ga]	'millet'	[kibí-ga]	'sensation'		
		~ [kimí-ga]		[kimi-ga]	'you (INFORMAL)'

   (b)   Verbs: accent presence/absence contrastive, but location determined by affix

Accented stem		*Unaccented stem*	
[kaké-ɾɯ]	'hoist-NONPAST'	[kake-ɾɯ]	'be.lacking-NONPAST'
[káke-te]	'hoist-GERUND'	[kake-te]	'be.lacking-GERUND'
[kake-nágaɾa]	'hoist-while'	[kake-nagaɾa]	'be.lacking-while'

Similar patterns, in which nouns have more contrastive pitch-accent choices than verbs, include other Japanese dialects (Haraguchi 1977), Proto-Korean (isolate?; Whitman 1994), Xibe (Tungusic; Kubo 2008), and Ancient Greek (Greek; Devine & Stephens 1994).

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1   See §3.2 below for further discussion of the Hebrew case, in which adjectives show a pattern intermediate between the noun and verb patterns.

Finally, an analogous pattern can be found for tone. In Mono (Niger-Congo, Banda; Olson 2005), nouns have lexically specified tone shapes. By contrast, verb surface tone patterns are predictable from their inflectional forms, although there is evidence from deverbal derivational forms that even verbs may have underlying tone contrasts.

(3)   Tone in Mono (Olson 2005: 47-49, 51)

(a)   Nouns: any tone shape possible

[gósá]	'type of green'	[kākó]	'leaf'	[bùdú]	'buttocks'
[zúwā]	'flour'	[lēngā]	'slit drum'	[zàjā]	'anvil'
[lóbà]	'clothes'	[jāwò]	'firewood'	[gbàdò]	'grub'

(b)   Verbs: tone determined by inflection

Non-future:	H on first verb syllable; L on any other syllables
Future:	H on syllable preceding verb; L on all verb syllables
Imperative:	L on first verb syllable
Subjunctive:	M on first verb syllable
Stative:	Reduplicate first verb syllable; reduplicant bears HL; verb root bears L
Certainty:	Reduplicant bears HM; M on first verb-root syllable; L on any other syllables

Other languages in which nouns have more tone contrast possibilities than verbs (in complexity of underlying tone, in H tone location contrasts, or in resistance to tonal alternations) include Proto-Bantu and various modern Bantu languages (Kisseberth & Odden 2003) and Gã (Kwa; Paster 2000).

2.1.2 Prosodic shape

In Hebrew (Semitic; Glinert 1988; Bat El 1994), as well as in closely related Arabic (Semitic; Ryding 2005; McCarthy 2005), verbs are subject to a prosodic-shape restriction — they must fit into one of a number of disyllabic templates. Nouns may be templatic, but they need not be, particularly for loanwords. In (4), atemplatic nouns and verbs derived from those nouns are shown; regardless of the noun shape, the verbs are templatic, being bisyllabic and (here) showing the /i e/ of the *piʔel* conjugation.

(4)   Prosodic shape in Hebrew (Bat El 1994: 577-578)

(a)	Nouns: not necessarily disyllabic		(b)	Verbs: must fit disyllabic template	
	[xantariʃ]	'nonsense'		[xintreʃ]	'talk nonsense'
	[télegraf]	'telegraph'		[tilgref]	'telegraph'
	[sinxróni]	'synchronic'		[sinxren]	'synchronize'
	[ksilofon]	'xylophone'		[ksilfen]	'play the xylophone'
	[nostálgia]	'nostalgia'		[nistelg]	'be nostalgic'

A different prosodic-shape effect is found in Mbabaram (Paman; Dixon 1991). Long vowels are relatively rare, but they are found only in nouns, never in verbs.

(5)   Long vowels in Mbabaram nouns (Dixon 1991: 357)

Form with long vowel (noun)   *Minimally contrasting form, for comparison*

[guːɽ]   'nulla nulla'   [guɽ]   'elbow'

[jaːɽ⁽ə⁾]   'spear'   [ja-ɽə]   'give-PAST'

[nɔ́ːmbɨ]   'big red wallaroo'

[gawíːr]   'tomahawk'

[nambúːɽ]   'big brown snake'

2.1.3 Absence of segmental patterns

The cases of noun privilege reviewed above all involve a suprasegmental or prosodic contrast — tone, accent, or stress, or word shape or size. Even the vowel-length case in Mbabaram is prosodic rather than segmental on the view that vowel length is not a segmental feature, but results from the association of one segmental melody to two timing units (Clements & Keyser 1983).

One apparent case of noun privilege that does involve segmental features is found in Nivkh (isolate). However, Shiraishi (2004) demonstrates that apparent noun/verb asymmetries in Nivkh can be analyzed in terms of base identity, since nouns can appear unaffixed in Nivkh but verbs cannot. (See §4.1 below for discussion of this point and, more generally, of the relationship between lexical category effects and the distinction between free and bound stems.)

2.2 Phonological augmentation in nouns

In several languages, only nouns are subject to word-minimality requirements. This might look like verb privilege, as requirements are imposed specifically on nouns. However, there is one circumstance in which phonological privilege correlates with special requirements: positional augmentation (Smith 2005), in which a privileged position is required to have some perceptually salient property. Positional augmentation is technically a type of neutralization, because all instances of position P must have property X — but unlike other types of neutralization, it is a diagnostic for phonological strength.

Word minimality has been analyzed as a requirement for a (morphological) word to be coextensive with a prosodic word (Prince 1980; Broselow 1982; Crowhurst 1992). Content morphemes are often subject to minimality effects in contrast to function morphemes, supporting the classification of minimality effects as positional augmentation. Thus, the noun-specific minimality effects discussed here are compatible with the claim that nouns have greater phonological privilege than verbs.

Chuukese (Micronesian; Muller 1999) is one language in which nouns, but not verbs, are subject to a bimoraic word-size minimum. There is a general requirement, affecting both nouns and verbs, that the expected word-final mora not surface, so underlying final vowels are deleted if short and shortened if long. Crucially, when this truncation process would result in a monomoraic surface form, nouns undergo vowel lengthening. This results in a surface contrast between CVC and CVːC for verbs, but not for nouns, because potential *CVC nouns surface as CVːC.

(6)   Word minimality in Chuukese (final codas do not contribute weight; initial geminates do)

(a)   Nouns: minimally bimoraic (Muller 1999: 395)

		UR	Final mora loss			
CCVC already bimoraic		/ kkeji /	[kkej]	'laugh'		
		/ t͡ʃt͡ʃara /	[t͡ʃt͡ʃar]	'starfish'		
*CVC undergoes lengthening		/ fasa /	[faːs]	'nest'	*[fas]	
		/ fæne /	[fæːn]	'building'	*[fæn]	

(b)   Verbs: no bimoraic minimum (data from Goodenough & Sugita 1980: xiv-xv)

[fan]	'go aground'	[faːn]	'break open'
[mær]	'move, be shifted'	[mæːr]	'grow (plant)'

See also §4.1.2 for a discussion of Chuukese in the context of the morphological free/bound distinction and category-specific phonology.

Other languages in which nouns, but not verbs, have minimality requirements include Chukchee and Koryak (Chukotko-Kamchatkan; Krause 1979).

2.3 Phonological privilege in verbs

The languages in §2.1 are clearly classifiable as cases of noun privilege, since nouns allow more contrasts than verbs. Given that augmentation processes specifically target privileged positions, the cases in §2.2 are also compatible with the view that nouns are privileged compared to verbs. The languages considered in this section, however, present a different pattern; they seem to show greater phonological privilege for verbs than for nouns.

2.3.1 Tone

In Ewe (Kwa; Ansre 1961) nouns, the contrast between H and L tone is neutralized in syllables with voiced obstruent onsets; only L is possible in that context. However, verbs may have H or L tone with any onset type.

(7)   Consonant/tone cooccurrence restrictions in Ewe (Ansre 1961: 27-28, 34-35, 39)

(a)   Nouns: voiced obstruent onset may not cooccur with H tone[2]

Voiceless obstruents:	[ɸú]	'bone'	[ɸù]	'sea'
	[tú]	'gun'	[tè]	'yam'
Sonorants:	[jí]	'cutlass'	[à-jè]	'the trick'
	[ŋɔ́]	'worm'	[à-ŋè]	'the rubber'

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2   Some noun examples are slightly modified from Ansre (1961). Ansre shows these L-tone examples for voiceless obstruents and sonorants with a specifier [lá], glossed 'the' ([ɸū lá] 'the sea'), in order to demonstrate that the L tone has a mid allotone when nonfinal. I have removed the specifier and adjusted the gloss and tone mark, because the distinction between allotones of L is not of concern here.

Voiced obstruents:	(H unattested)			[βù]	'blood'
				[dà]	'snake'

(b) Verbs: onsets, tones cooccur freely

Voiceless obstruents:	[fá]	'is cold'	[fù]	'is white'
	[tú]	'to shut'	[tù]	'to grind'
Sonorants:	[jɔ́]	'to call'	[jɔ̀]	'to hurry'
	[ŋé]	'to break'	[ŋè]	'to groan'
Voiced obstruents:	[bú]	'to be lost'	[bù]	'to respect'
	[vó]	'to rot'	[vò]	'to be free'

Thus, verbs have a greater number of surface tone contrasts than nouns.

2.3.2 Segmental deletion—?

A small number of cases may involve verb privilege in resisting segmental deletion. These are unusual in two ways: noun privilege seems to be much more common than verb privilege, and category-specific phenomena tend to be suprasegmental or prosodic rather than segmental or featural. In fact, the cases discussed here are not unambiguous examples of segmental deletion, and at least one might be reanalyzed as noun augmentation rather than verb privilege.

One apparent example of segmental deletion that affects nouns, but not verbs, is seen in Paamese (Oceanic; Crowley 1997: 243-244). Proto-Paamese */l/ was lost in northern Paamese in a variety of environments, including word-initially, but word-initial */l/ has been preserved in verbs specifically.

(8)   Loss of initial */l/ in northern Paamese does not apply to verbs (Crowley 1997: 243-4)

(a)   Nouns show loss of initial */l/

*leiai	—>	[eiai]	'bush'
*la:la	—>	[a:ia]	'kind of bird'

(b)   Verbs preserve initial */l/

*leheie	—>	[lehei]	'she/he pulled it'
*loho	—>	[loh]	'she/he ran'
*la:po	—>	[la:po]	'she/he fell'

Liquid onsets, being high in sonority, are marked, especially in word-initial position (Smith 2005). Thus, in Paamese we seem to have a case where a marked segment is being tolerated in verbs even though it is not tolerated in nouns. If this is the correct interpretation, Paamese would be a case of greater phonological privilege for verbs. However, the avoidance of high-sonority onsets is arguably another kind of augmentation effect (Smith 2005; see also de Lacy 2001), providing a sharp sonority increase for syllables in prominent positions. Thus, a second interpretation is possible, according to which the avoidance of initial liquids in nouns is evidence for noun privilege after all. Moreover, viewing initial */l/ loss in nouns as driven by sonority (i.e., syllable-structure) requirements would bring Paamese in line with the general observation that category-specific phenomena are prosodic rather than segmental.

Another example that might involve segmental deletion is Mohawk, in which, according to Postal (1968), word-final stops were lost in nouns (except reduplicating animal names), although they were retained in morphologically related verbs. This does appear to be a phonological process affecting specifically nouns and not verbs — a case of verb privilege. However, it is unclear whether segmental deletion is the best characterization of the process. Postal's examples are compatible with the view that the driving force behind the noun deletion was word-final cluster simplification, which again is a matter of syllable structure, not segments per se.

2.4 Distinct restrictions on nouns and verbs

This section presents cases in which neither nouns nor verbs appear to have a greater array of phonological contrasts; both categories are subject to some phonotactic requirement. However, the requirements that hold of nouns and those that hold of verbs are distinct.

2.4.1 Stress assignment

In Lenakel (Oceanic; Lynch 1975, 1978), primary stress is always penultimate, but secondary stress assignment is different for nouns and verbs. In nouns, secondary stresses are assigned on alternating syllables *leftward* from the primary stress, and initial syllables might not bear stress. In verbs, the initial syllable always bears a secondary stress (unless the second syllable has primary stress), and additional secondary stresses are assigned on alternating syllables *rightward* from the initial syllable, subject to the condition that no secondary stress immediately precedes the primary stress.

(9)   Stress assignment in Lenakel (Lynch 1978: 19)

(a)   Nouns: secondary stress assigned rightward from primary-stress syllable
/ kamatoa /   [kà.ma.dó.ɑ]   'kind of taro'
/ nɨmʷakɨlakɨl /   [nɨ.m̀ʷə̀.gə.lá.gəl]   'beach'
/ tupʷalukaluk /   [tu.b̀ʷə̀.lu.gá.lʊkʰ]   'lungs'

(b)   Verbs: secondary stress assigned leftward from initial syllable
/ r-ɨm-olkeikei /   [r̀ɨ.mɔl.géj.gɛj]   'he liked it'
/ n-ɨm-ar-olkeikei /   [nɨ̀.ma.rɔl.géj.gɛj]   'you-PL liked it'
/ n-ɨm-am-ar-olkeikei /   [nɨ̀.ma.mà.rɔl.géj.gɛj]   'you-PL were liking it'
/ t-n-ak-am-ar-olkeikei /   [t̀ɨ.na.gà.ma.rɔl.géj.gɛj]   'you-PL will be liking it'

A similar, although less straightforward, case is English (Germanic; Kelly 1988; see also Chomsky & Halle 1968), which has a preference (not a requirement) for initial/trochaic stress in disyllabic nouns versus final/iambic stress in disyllabic verbs. See §4.3 below.

2.4.2 Tonal patterns

In Lamang (Chadic; Wolff 1983), nouns and verbs each have predictable tone, but different factors determine the surface tones in each case (10). Noun tones are determined by the onset consonant, interacting with phrase-level and assimilatory effects. The basic pattern is that tone is low when the onset is a voiced obstruent (as for nouns in Ewe; see §2.3.1), and tone is high[3] when the onset is a sonorant, a

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3   In some cases a preceding low tone causes this potential high tone to assimilate and become low (Wolff 1983: 67). In addition, there are certain phrase-level dissimilatory effects as well as an "accent" that may boost tone on the

voiceless obstruent, or one of [ɓ] or [ɗ], which Wolff (1983: 28) describes as "laryngealized" but "only…incidentally 'implosive' on some occasions." Verb tones, on the other hand, are entirely determined by inflectional category, except for two exceptional verb roots that pattern like nouns.

(10)   Predictable tone patterns in Lamang (Wolff 1983: 67-8, 77)

(a)   Nouns: L after voiced obstruent, H otherwise
Voiced obstruents (L)   *Voiceless obstruents (H)*   *Sonorants (H)*
[ɣʷà]   'mountain'   [ɬá]   'cow'   [éwé]   'mouth'
[dzɛ̀vò]   'hand'   [útáká]   'country'   [ḿkílí]   'rat (spec.)'

(b)   Verbs: tone determined by inflectional category
[kɛ̀lì]   'I take (CONTINUOUS)'   [kə́lí]   'I take (DURATIVE CONTINUOUS)'
[kàkɛ̀lì]   'I have begun to take (PERFECT II)'   [kákə́lí]   'I have taken (PERFECT I)'
[kɛ̀làjò]   'that I take (SUBJUNCTIVE I)'   [kɛ̀lájó]   'I took (AORIST)'

Lamang is typologically unusual in that, unlike nouns and verbs, function morphemes do have contrastive tones (Wolff 1983: 74). It is more common typologically for lexical morphemes to have greater freedom in phonological contrast than function morphemes have (McCarthy & Prince 1995: §6.2; Beckman 1999). Lamang ideophones, which Wolff calls "expressives," also have contrastive tones.

2.4.3 Prosodic shape

Finally, there are some languages in which prosodic-shape restrictions are found for both nouns and verbs, but the restrictions are different for the two categories.

One example, discussed by McCarthy (2005), is Classical Arabic (Semitic). As mentioned in §2.1.2, all verbs in Arabic are templatic; most nouns are templatic as well. McCarthy (2005) shows that different restrictions on template shape hold for nouns and for verbs. Noun templates may only begin with one consonant, but verb templates may begin with either one or two consonants. On the other hand, verb templates must end with CVC, but noun templates may end with CVC, CV:C, or CVCC.

(11)   Template shape in Arabic (McCarthy 2005: 178, 209)

(a)   Noun templates: no initial CC; may end with CVC, CV:C, or CVCC
Triliteral   *Quadriliteral*
CV CVC   CVC CVC
CV: CVC
CV CV:C   CVC CV:C
CV: CV:C
CVCC

(b)   Verb templates: initial CC allowed; must end with CVC
CV CVC   CVC CVC   CV: CVC
CCV CVC   CCVC CVC   CCV: CVC

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antepenultimate syllable of the phrase. For a summary of predictable tone effects in nouns, see Wolff (1983: 72).

Another language in which prosodic-shape requirements affect nouns and verbs differently is Itelmen (Bobaljik 1998, 2008). In nouns, a 'resonant' consonant (sonorants, plus [z]) must be adjacent to a vowel; otherwise, a preceding schwa is epenthesized. Nouns consequently show schwa-zero alternations, since the environment for epenthesis is met in some morphological forms but not in others. In verbs, resonants likewise never violate this restriction, but there are no schwa-zero alternations. According to Bobaljik's interpretation, schwa epenthesis overapplies in verbs, in that it applies to *all* forms of a verb if its environment is met in *some* form.

(12)   Schwa epenthesis in Itelmen (Bobaljik 2008: 44)

    (a)   Nouns: epenthesis and alternations

        [ɬxəm]   'sable-SG'   [ɬxm-en']   'sable-PL'

        [spəl]   'wind-DIRECT'   [spl-ank]   'wind-LOCATIVE'

        [ʷtχəz-xʔal]   'road-ABLATIVE'   [ʷtχz-enk]   'road-LOCATIVE'

    (b)   Verbs: no alternations; overapplication of epenthesis

        [t-zəl-t͡ʃen]   'I gave it.'   [zəl-en]   'You gave it.'   *[zlen]

        [t-ɬəm-t͡ʃen'] 'I killed them.'   [q-ɬəm-in] 'Kill it!'   *[qɬmin]

        [spəl-qzu-in] 'It was windy.'   [spəl-in]   'It was windy.'   *[splin]

The Itelmen pattern involves a prosodic-shape requirement that affects both nouns and verbs: a syllabification restriction on 'resonants'. However, nouns may show morphological alternations with respect to the schwa epenthesis, whereas verbs may not. Bobaljik's (1998, 2008) formal analysis of this pattern has epenthesis apply cyclically in verbs but noncyclically in nouns; thus, it is only verbs that undergo epenthesis in cases where subsequent affixation would potentially bleed that process. On this approach, it is not immediately clear whether nouns or verbs should be seen to have greater phonological privilege, since both are subject to an epenthesis process. (On the other hand, if the avoidance of alternation is seen as an additional requirement that holds of verbs only, then Itelmen could be a case of noun privilege as in §2.1).

Both Classical Arabic and Itelmen have featured in discussions of base identity as an alternative to category-specific phonology; see §4.1.2 below.

2.4.4 Absence of patterns involving segmental contrasts

As with the examples of noun privilege discussed in §2.1 and §2.2, the languages with distinct predictable patterns for nouns and verbs seem to involve exclusively suprasegmental and prosodic properties such as stress, tone, and syllable structure. One language that has been said to have different segmental inventories in nouns and verbs is Michif (Bakker 1997). However, this difference would probably not strictly speaking be a lexical category effect, as Michif is a mixed language in which nouns and verbs tend to derive from distinct source languages, Canadian French (Romance) and Plains Cree (Algonquian) respectively. Furthermore, Rosen (2007) argues that French/Cree stratification is not synchronically relevant for Michif phonology.

2.5 Summary: Survey of category-specific effects

The category-specific effects reviewed in §2, involving differences in phonological behavior between nouns and verbs, are summarized in Table 1.

Language	Phenomenon	N/V pattern
Spanish Hebrew Japanese Proto-Korean Sibe Ancient Greek Mono Proto-Bantu Hebrew Mbabaram	stress stress accent accent accent accent tone tone prosodic shape prosodic shape	N privilege
Chuukese Chukchee, Koryak	prosodic shape prosodic shape	N augmentation
Paamese	diachronic segment deletion(?)	V privilege?/N augmentation?
Ewe Mohawk	tone diachronic segment deletion(?)	V privilege
Lenakel Lamang Arabic Itelmen	stress tone prosodic shape prosodic shape	Distinct but predictable

Table 1
Noun/verb differences in phonological behavior.

Noun privilege (plus noun augmentation, which is arguably related to noun privilege) appears to be the most common pattern, with fewer cases of verb privilege and distinct predictable patterns for nouns and verbs. Nearly all of these examples of category-specific phonological behavior involve either suprasegmental properties like stress, accent, and tone, or else prosodic shape (word minimality, word or syllable shape, or vowel length). The only cases possibly involving segmental phenomena that have emerged in this survey are the two examples of diachronic segment deletion specific to nouns, and as noted in §2.3.2, these may be reinterpretable as prosodic effects as well.

3. Adjectives

Adjectives are in a sense intermediate between nouns and verbs morphosyntactically, and their phonological behavior reflects this as well. In some languages, adjectives fall together either with nouns or with verbs in terms of their phonology, and the grouping they form often correlates with the nature of adjectival inflectional morphology in the language (§3.1). In other languages, adjectives have "partial privilege" — they lie between nouns and verbs on a continuum of phonological behavior (§3.2).

3.1 Adjectives as a subcase of nouns or verbs

In a language with category-specific phonological patterns, adjectives often pattern with either nouns or verbs in a way that mirrors their categories of inflection.

Language	Phenomenon	N/V pattern	*Adjective behavior*	*Adjective inflection*
(a) Adjectives pattern with nouns				
Spanish Mono Mbabaram Hebrew	stress tone prosodic shape prosodic shape	N privilege	**same as N**	**N-type**
(b) Adjectives pattern with verbs				
Japanese Ewe	accent tone	N privilege V privilege	**same as V**	**V-type**
(c) Pattern is more complicated				
Hebrew	stress	N privilege	**N > A > V**	**N-type**
Mandarin	reduplication	Distinct	**Distinct**	**isolating language**
Lenakel	stress	Distinct	**depends on role?**	**depends on role?**

Table 2
Adjective behavior and inflection type.

When adjectives inflect for N-type morphological categories such as person, gender, number, or case — as in Spanish, Mono, Mbabaram, and Hebrew (a) — they tend to pattern phonologically with nouns. Analogously, when adjectives inflect for V-type categories such as tense, mood, or aspect — as in Japanese and Ewe (b) — they tend to pattern phonologically with verbs.

The languages in (c) present additional complications, however. In Hebrew, adjectives inflect for nominal categories, but their behavior with respect to stress is actually intermediate between that of nouns and verbs. Mandarin (Sino-Tibetan) is a language that does not have much of an inflectional system at all, but here again, adjectives show a pattern that is distinct from both nouns and verbs. These two cases are discussed in §3.2, along with an additional case, Finnish (Finnic), that shows distinct behavior between nouns and adjectives even when they bear the *same* inflectional morphemes. Finally, Lenakel (see §2.4.1 above) appears to show a tight correlation between inflectional morphology and category-specific phonology; this language is discussed further in §4.2 below.

3.2 Adjectives as an intermediate category

Many languages show adjectives patterning together with either nouns or verbs, but Hebrew stress, Mandarin reduplication, and Finnish mutation and deletion are phonological phenomena in which adjectives have their own specific pattern. These cases nevertheless suggest that even when adjectives show distinct behavior, they fall at a point intermediate between nouns and verbs with respect to phonological privilege.

Becker (2003) discusses stress in Hebrew, in which nouns, adjectives, and verbs all show distinct behavior. The default is "mobile" stress, in which stress is attracted to the right edge of the word: mobile stress falls on the final syllable of an unaffixed form, or on the rightmost suffix. All verbs have mobile stress. Adjectives and nouns differ from verbs; they have a phonological contrast between mobile stress and "fixed" stress, a pattern in which stress remains on a particular syllable of the base. But there is a further difference between adjectives and nouns. When adjectives have fixed stress, it always falls on the root-final syllable, whereas the location of fixed stress is contrastive for nouns.

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(13)   Stress contrasts in Hebrew (Becker 2003: 1-2)

    (a)   Nouns: location of fixed stress is contrastive
        Mobile stress

[dikdúk]	'grammar-SG'	[dikduk-ím]	'grammar-PL'

        Fixed stress

[kópirajter]	'copywriter-SG'	[kópirajter-im]	'copywriter-PL'
[diktátor]	'dictator-SG'	[diktátor-im]	'dictator-PL'
[tút]	'strawberry-SG'	[tút-im]	'strawberry-PL'

    (b)   Adjectives: fixed stress is always root-final
        Mobile stress

[tóv]	'good-SG'	[tov-ím]	'good-PL'

        Fixed stress

[maljón]	'rich-SG'	[maljón-im]	'rich-PL'
[fonológ-i]	'phonological-SG'	[fonológ-i-im]	'phonological-PL'

    (c)   Verbs: always mobile stress

[ʃamár]	'keep-SG'	[ʃamr-ú]	'keep-PL'
[bizbéz]	'spend-SG'	[bizbez-ú]	'spend-PL'

As Becker (2003) observes, this means that adjectives have greater phonological freedom than verbs, but not as much as nouns.

    In Mandarin, nouns, adjectives, and verbs show distinct behavior in reduplication (Feng 2003). Disyllabic (AB) adjectives reduplicate as AABB, while disyllabic verbs reduplicate as ABAB. (Disyllabic nouns do not reduplicate, although monosyllabic nouns do.) Some adjective or verb bases reduplicate both ways, in which case the AABB form is an adjective, and the ABAB form is a verb.

(14)   Reduplication in Mandarin (Feng 2003: 2)[4]

    (a)   Adjectives: AB —> AABB

[kán.tɕîŋ]	'clean'	[kán.kán.tɕîŋ.tɕîŋ]	'clean (intensified)'
[mʲĭŋ.pǎi]	'clear'	[mʲĭŋ.mʲĭŋ.pǎi.pǎi]	'clear (intensified)'

    (b)   Verbs: AB —> ABAB

[tɕʰîŋ.tʂʷû]	'celebrate'	[tɕʰîŋ.tʂʷû.tɕʰîŋ.tʂʷû]	'celebrate a little'
[tǎ.sàw]	'clean up'	[tǎ.sàw.tǎ.sàw]	'clean up a little'

    (c)   Shape of reduplicated form determines category

Adjective base	[káw.ɕîŋ]	'happy'
AABB = adjective	[káw.káw.ɕîŋ.ɕîŋ]	'happy (intensified)'
ABAB = verb	[káw.ɕîŋ.káw.ɕîŋ]	'have some fun'

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4   Mandarin tone marks are given in accordance with IPA usage, rather than pinyin usage as in Feng (2003).

Verb base	[ʈʂĭ.tʲɛ̀n]	'suggest'
AABB = adjective	[ʈʂĭ.ʈʂĭ.tʲɛ̀n.tʲɛ̀n]	'critical, bossy'
ABAB = verb	[ʈʂĭ.tʲɛ̀n.ʈʂĭ.tʲɛ̀n]	'comment here and there'

Feng (2003: 7) presents evidence from third-tone sandhi alternations that the morphosyntactic bracketing in the two cases is distinct; namely, [A[AB]B] (adjectives) but [AB][AB] (verbs). She sees this as driving the difference between adjective and verb reduplication; for verbs, it is more important for the edges of morphosyntactic constituents to align with the edges of prosodic constituents (on the assumption that all four-syllable reduplicated forms have the prosodic constituency (σσ)(σσ)), whereas for adjectives, it is more important that the linear sequence AB from the base form not be disrupted. The different structures and their differing priorities are shown in (15).

(15)   Morphosyntactic and prosodic constituents in Mandarin reduplication

	Verbs					*Adjectives*			
	A	B	A	B		A	A	B	B
M-s	[		][		]	[	[	]	]
Pros	(		)(		)	(		)(	)

    ✓ Edges match   * Edges do not match
    * Linear sequence of base not respected   ✓ Linear sequence of base respected

Mandarin differs from Hebrew because here, it is not entirely clear whether it is adjectives or verbs that should be seen as having greater phonological privilege; each category has a predictable reduplication type, even though they differ. However, adjectives do set a higher priority for maintaining the linear sequence of the base. From the viewpoint of Optimality Theory (Prince & Smolensky 2004) under Correspondence Theory (McCarthy & Prince 1995), this suggests higher-ranking faithfulness for adjectives than for verbs, and therefore greater phonological privilege for adjectives.[5]

Finally, Anttila (2002) discusses a category-specific effect in Finnish involving two different phonological alternations: under certain morphological and phonological conditions, a stem-final /a/ either deletes, or changes to /o/ (mutates), when the plural morpheme /-i-/ is added. An examination of a corpus of Finnish shows that, in the absence of phonological factors leading to a preference for one strategy or the other (e.g., a tendency to avoid mutation after labial consonants), the mutation option is preferred by nouns and the deletion option is preferred by adjectives. This difference is seen even when nouns and adjectives are inflected with identical affixes.

(16)   Deletion versus mutation in Finnish (Anttila 2002: 13)

    (a)   Nouns: prefer mutation

/ kihara-i-ssa /	'curl-PLURAL-INESSIVE'	—>	[kiharo-i-ssa]
/ korea-i-ssa /	'Korea-PLURAL-INESSIVE'	—>	[koreo-i-ssa]

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5 Another interesting point related to lexical categories in Mandarin reduplication is that AB verbs actually reduplicate as ABAB only if both the A and B morphemes are verbal; V+object (N) forms reduplicate as AAB (Feng 2003: 3).

(b)   Adjectives: prefer deletion

/ kihara-i-ssa /   'curly-PLURAL-INESSIVE'   —>   [kiharØ-i-ssa]

/ korea-i-ssa /   'beautiful-PLURAL-INESSIVE' —>   [koreØ-i-ssa]

Again, it is somewhat difficult to interpret this pattern in terms of relative phonological privilege, because both mutation and deletion involve a phonological process. However, mutation, the pattern favored by nouns, does preserve all input segments (even though certain feature values are changed), so it is not out of the question to view the correlation between mutation for nouns versus deletion for adjectives as a consequence of greater noun privilege.

3.3 Adjective patterns as scale conflation

The examples in §3 each appear to be compatible with one of the following scales:[6] adjectives fall together with nouns, fall together with verbs, or exhibit a degree of privilege intermediate between that for nouns and verbs.

(17)   Scales of phonological privilege by lexical category

(a) { N ,   A } > V

(b)   N > { A   , V }

(c)   N > A   > V

This pattern is very suggestive of *markedness conflation* (de Lacy 2004), in which there is a universal markedness scale X > Y > Z, but on a language-specific basis, adjacent levels of the scale can be conflated and pattern as a single class with respect to that markedness dimension. So positing a universal scale of phonological privilege for lexical categories, as in (17c), is compatible with the existence of languages that conflate the middle category, A, with N (17a) or V (17b).

4. Attempting non-phonological explanations

The discussion so far has focused on demonstrating that there exist languages with category-specific phonological effects. However, important questions remain. Does the phonological grammar actually need to refer to lexical categories? Or can all category-specific effects be reduced to epiphenomena, simple outcomes of the interaction between phonology and other modules of the grammar such as morphology or syntax? Finally, to the extent that there are category-specific effects in phonology, does this require reference to the same lexical category labels used by the morphosyntax, or should it instead be handled in the same way as cases of exceptional phonological behavior by arbitrary classes of morphemes?

This section considers the distinction between morphologically free and bound forms (§4.1), the relationship between nominal or verbal inflection and category-specific behavior (§4.2), prosodic structure (§4.3), and morpheme-specific effects (§4.4). While some of these factors are relevant some of the time, not all cases of category-specific phonology can be reanalyzed in these terms.

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6   The scales in (17) assume a more basic scale N > V, with greater phonological privilege for nouns than for verbs. As noted in §2.5 above, cases that seem to show greater privilege for verbs than for nouns appear to be few in number and exceptional in pattern; in particular, two out of three of the cases may involve segmental phonology, which category-specific patterns generally do not. Further investigation is needed to determine whether the scale of privilege N > V is truly a typological (near-)universal, but the intermediate behavior of adjectives reviewed in this section could be seen as additional support for this view.

4.1 Free versus bound

As seen in Table 3, there is often overlap between the lexical categories in a language with phonological privilege, and the lexical categories in that language that occur as free forms (without obligatory overt inflection).

Language	Phenomenon	N/A/V privilege	Free/bound
Japanese	accent	N > A,V	N free | A,V bound
Mono	tone	N, A > V	N, A free | V bound
Mbabaram	prosodic shape	N, A > V	N, A free (absolutive case) | V bound
Lenakel	stress	N, (A) ≠ (A), V	N free | A by function | V bound

Table 3
Phonological privilege matches free/bound distinction.

Indeed, some of the apparent category-specific effects discussed in the literature have been shown either to reduce directly to the free/bound distinction, or to exhibit base-identity effects that can be formally modeled with reference to the free/bound distinction. Examples of each type are reviewed in §4.1.1.

As shown in Table 4, however, some cases of category-specific phonological patterns cannot be directly equated with the distinction between free and bound forms. These are discussed in §4.1.2.

Language	Phenomenon	N/A/V privilege	Free/bound
Spanish	stress	N, A > V	N, A free or bound | V bound
Chuukese	prosodic shape	N > V	Both N, V free (modulo truncation)
Mandarin	reduplication	N ≠ A ≠ V	N, A, V can all be free
Hebrew	prosodic shape	N, A > V	N, A free or bound | V bound
	stress	N > A > V	

Table 4
No exact match between phonological privilege and free/bound distinction.

4.1.1 Category-specific effects that reduce to free/bound effects

Some apparent category-specific effects have been argued to reduce to the distinction between free and bound forms, either directly as for word-minimality requirements, or indirectly as for base-identity effects.

In Chuukese (§2.2; see also §4.1.2), minimality requirements truly differentiate between nouns and verbs. However, some cases of apparent category-specific minimality are actually due to the free/bound distinction: if the minimality requirement holds at the level of the word, and (by definition) only free forms can constitute words on their own, then only free forms show minimality effects.

For example, consider Mono (Niger-Congo, Banda). Olson (2005: 75, 79) observes that there are no monosyllabic surface forms of nouns (or adjectives), and proposes a process of Subminimal Root Augmentation (SRA) that epenthesizes a copy vowel into an underlyingly monosyllabic noun: $/CV_1/$ —>

[V1CV1]. However, Olson (2005: 82) explicitly notes that SRA does not apply to verbs because verbs must appear with some inflectional affix, so they never happen to be monosyllabic on the surface even if they have a subminimal root. Moreover, Olson (2005: 89, 94) shows that even /CV/ nouns fail to undergo SRA if they bear a plural affix or form part of a compound. In short, there is no need for a category-specific analysis of minimality in Mono. It is simply the case that *words* must be bisyllabic; for unrelated reasons, only nouns and adjectives may surface unaffixed, so only they are ever in danger of violating the category-free requirement on word size.

There is another, more abstract way in which the free/bound distinction potentially has implications for privilege in maintaining phonological contrast. In some languages, morphologically complex forms show base-identity effects — phonological similarity to some aspect of their morphological base forms. This has been modeled as phonological cyclicity, or in terms of constraints that enforce faithfulness to morphologically related base forms (e.g., Kiparsky 1982, 2000; Kenstowicz 1996; Benua 2000). Schematically, suppose that a language has a base form /X/ and a complex form /X+Y/. In the absence of base-identity effects, the phonological grammar simply applies to the segments in /X+Y/ as they appear there. But if there is a base-identity effect, then some similarity requirement holds between the surface form of [X+Y] and the surface form of its base [X], giving rise to a property of [X+Y] which would not be expected if this form were simply subject to the phonological grammar of the language on its own.

Base-identity effects are relevant in the context of the free/bound distinction because if a root /X/ never appears unaffixed, as *[X], then the nonexistent surface form *[X] will never influence the phonology of the morphologically complex /X+Y/. If nouns and verbs differ precisely in this way, such that [N] is a possible surface form but [V] is not, this could potentially lead to differences in the phonology between [N+affix] and [V+affix] forms: [N+affix] forms might show base-identity effects that [V+affix] forms do not show. Such a pattern would not require crucial use of category-specific phonology, however, because the fundamental distinction would instead be that between free and bound forms.

Precisely this argument has been made by Shiraishi (2004) for Nivkh (isolate), in which noun and verb phonology differs in several ways, involving segmental effects (which, as noted above, are rare among category-specific phonological phenomena). Nivkh has a four-way contrast among obstruents: stops and fricatives contrast with each other, and furthermore aspirated stops and voiceless fricatives (the 'fortis' obstruents) contrast with plain stops and voiced fricatives (the 'lenis' obstruents).

(18)   Nivkh obstruent inventory (Shiraishi 2004: §2.1)[7]

	fortis					*lenis*				
stops	pʰ	tʰ	cʰ	kʰ	qʰ	p	t	c	k	q
fricatives	f	ř	s	x	χ	v	r	z	ɣ	ʁ

Although these sounds are all contrastive, there are contexts in which neutralization processes override these contrasts. One such case involves the neutralization of the stop/fricative contrast in non-phrase-initial position in a morphologically derived environment: following a vowel, glide, or stop, obstruents surface as fricatives, but following a nasal or fricative, obstruents surface as stops (Shiraishi 2004: §2.1).

An apparent difference between categories appears in a systematic exception to this stop/fricative pattern. Nouns resist changing stem-initial fricatives into stops when a pre-stem morpheme is added. The

7   Shiraishi (2004: §2.1) describes /c cʰ/ as (pre-)palatals that are inconsistently characterized in the literature as plosives or affricates. He notes that /r/ and its (partially) devoiced counterpart /ř/ pattern phonologically with fricatives.

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requirements of morphologically derived environment and non-phrase-initial position are met, but the underlying fricatives still surface as fricatives.

(19)   Hardening in Nivkh (Shiraishi 2004: §2.1-2)

    (a)   Nouns: resist hardening

        [tʰulv v̲o]   *[tʰulv b̲o]   'winter' + 'village'

        [cʰŋər v̲ox]   *[cʰŋər b̲ox]   'grass' + 'hill'

        [təf ř̲ə]   *[təf t̲ʰə]   'house' + 'door'

        [tʰeŋ v̲aqi]   *[tʰeŋ b̲aqi]   'coal' + 'box'

    (b)   Verbs: undergo hardening

        [cʰxəf q̲ʰa-]   (< /χa-/)   'bear' + 'shoot'

        [cus t̲ʰa-]   (< /ř̲a-/)   'meat' + 'bake'

        [tux k̲e-]   (< /x̲e-/)   'axe' + 'take'

        [pʰnənx t̲əu-]   (< /r̲əu-/)   'one's sister' + 'teach'

Shiraishi argues that the important difference here is that noun stems can appear in isolation, but verb stems require affixation. Thus, only nouns are potentially subject to base-identity effects. In Shiraishi's (2004: §2.4) analysis, the fricative status of the initial consonant in a derived form must match that of its underived base, and this identity requirement takes priority over the usual process of hardening. For verbs, which have no base to enforce identity, hardening applies unimpeded. No reference to lexical category is needed to account for the noun/verb asymmetry. Shiraishi also presents a similar analysis for a second segmental-phonology difference between lexical categories in Nivkh, a process of stem-final fricative voicing under suffixation from which nouns are, again, exceptionally exempt.

      Base-identity accounts of category-specific patterns have also been developed by Kenstowicz (1996) for cluster simplification in Korean and by Cable (2005) for schwa epenthesis in Itelmen. However, Bobaljik (2008) argues that base identity is not the right way to approach Itelmen; see the discussion in §4.1.2 below. (Also, see Albright 2008, Albright & Kang to appear for a different view of 'base' for Korean nouns and verbs).

      Thus, for languages where a phonological difference between nouns and verbs aligns with the distinction between free and bound roots, it is possible that base identity could be invoked instead of category-specific phonological processes. This is a particularly attractive approach to Nivkh, where the phenomenon involved (segmental alternation) is not one that typically participates in category-specific effects. For a case like Mono, where lexical category is empirically less successful than the free/bound distinction for characterizing the environment where the phonological process applies, it is even more clear that appealing to lexical categories is undesirable. However, for the other languages listed in Table 3 above, either a base-identity account or a category-specific account appears to be feasible; the choice may come down to theory-internal considerations.

      In any case, the free/bound distinction cannot be the source of all category-specific effects. Some languages show category-specific phonology that cannot be handled in terms of differences between morphologically free and bound forms. Examples are discussed in the following section.

4.1.2 Mismatches with the free/bound distinction

The difference between free and bound roots is not always consistent with phonological differences between nouns and verbs. This is true when both nouns and verbs are bound, and when both nouns and verbs are free — or, more generally, when some free forms have more phonological privilege than others.

Spanish (§2.1.1) provides evidence that lexical-category differences in phonology are possible even among bound roots. It is true that verbs are always bound, while nouns and adjectives need not be. Crucially, however, the lexically contrastive antepenultimate stress pattern occurs even on noun and adjective stems that consist of a bound root and a (productive) gender suffix.

(20) Spanish bound roots with antepenultimate stress (data from Castillo & Bond 1948; Solá 1981)

		masculine	*feminine*	
(a)	Nouns:	[náwfɾaɣ-o]	[náwfɾaɣ-a]	'shipwrecked person'
		[bíɣam-o]	[bíɣam-a]	'bigamist'

		masculine	*feminine*	
(b)	Adjectives:	[lóβɾeɣ-o]	[lóβɾeɣ-a]	'murky, dismal'
		[próspeɾ-o]	[próspeɾ-a]	'prosperous, successful'
		[metóðik-o]	[metóðik-a]	'methodic'
		[bénet-o]	[bénet-a]	'Venetian'
		[supérflu-o]	[supérflu-a]	'superfluous'
		[puɾpúɾe-o]	[puɾpúɾe-a]	'purple'
		[simultáne-o]	[simultáne-a]	'simultaneous'

If noun- or adjective-specific contrast in Spanish were dependent on nouns and adjectives being able to appear as unaffixed forms, these antepenultimate examples would not be possible.

Chuukese (§2.2) provides further evidence that category-specific effects are not always due to the free/bound distinction. In this language, both nouns and verbs may appear unaffixed,[8] and yet only nouns are subject to a minimality requirement. Similarly, Mandarin (§3.2) shows a three-way difference between nouns, adjectives, and verbs in reduplication patterns, but this is a language with essentially no inflectional morphology at all.

An interesting case is the category-specific nature of stress in Hebrew (discussed in §3.2). Both nouns and adjectives may be atemplatic, i.e., morphologically free, but verbs may not. Arguably, status as an atemplatic form is precisely what correlates with the ability for a noun or adjective to take the fixed stress pattern (Becker 2003), because even nouns and adjectives predictably have mobile stress if they are templatic. However, the free/bound distinction cannot account for the further difference between free nouns, in which the location of fixed stress is phonologically contrastive, and free adjectives, in which fixed stress always falls on the root-final syllable.

As noted in §2.4.3, McCarthy (2005) describes a noun/verb difference in template shape in Classical Arabic. McCarthy analyzes this pattern using Optimal Paradigms theory, a variation on the base-identity approach (§4.1.1) in which similarity is enforced among members of a paradigm even in the

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8 As seen in §2.2, both categories are also subject to a final-mora truncation process, so roots do not in fact surface unaltered. However, this process does not distinguish between nouns and verbs, so it cannot be the source of the category-specific phonological difference.

absence of a free-standing base form. Bobaljik (2008) calls into question whether McCarthy's approach fully accounts for the Arabic pattern, noting, for example, that it predicts contrasts between noun and verb stem shapes that should be able to emerge under derivation even if not within inflectional paradigms (see Bobaljik 2008: §3.2.2 for detailed discussion). Regardless of the success of a (quasi-)base-identity approach to template shape, however, it is important to note that McCarthy's analysis, which replaces reference to lexical category with reference to facts about affix shape and template shape, does not address *all* category-specific effects in Arabic. As seen in §2.1.2, the fact remains that nouns may be templatic or atemplatic, but verbs must be templatic. In other words, Arabic nouns still allow a greater degree of phonological contrast in their prosodic shape than verbs do, in a way that stands outside the template system and therefore cannot be derived from the differences between affix inventories for templatic nouns and verbs.

Finally, Bobaljik (2008), discussing Itelmen (described in §2.4.3 above), argues specifically against the attempt to recast all category-specific effects in terms of base identity. He shows that some verbs are derived from 'category-neutral' roots, which can also be nouns and therefore have a free base form. Nevertheless, these verbs still follow the general verb pattern of schwa epenthesis. This is similar to Chuukese, where verbs are no less free than nouns, but nouns are phonologically privileged. Conversely, some Itelmen nouns have obligatory singular inflection and are therefore not free, but they nevertheless follow the noun pattern of schwa epenthesis. This is similar to Spanish, where nouns and adjectives have greater phonological freedom even when bound. As Bobaljik argues, these two types of mismatch between noun/verb and free/bound show that, in Itelmen, lexical category predicts phonological patterning more accurately than the free/bound distinction does.

In summary, the fact that nouns often appear phonologically privileged as compared to verbs may well be related at some fundamental level to the fact that nouns are crosslinguistically more likely to be free forms. However, attempts to relate these two asymmetries directly, in frameworks that make crucial use of the bound/free distinction to invoke the existence of a morphological base form that accounts for special aspects of noun phonology — or even frameworks that simply make use of differences in the inventories of inflectional morphemes for the two categories to account for phonological differences — are unable to capture the full range of category-specific phonological effects.

4.2 Inflectional morphology

As noted in §3, whether adjectives pattern phonologically with nouns or verbs shows a striking correlation with whether adjectives inflect for nominal or verbal categories. A particularly interesting case is Lenakel (see §2.4.1), where adjectives take verbal inflection when they are predicates, but not when they modify nouns (Lynch 1975, 1978). The presence or absence of verbal morphology on adjectives probably determines whether they take on the stress pattern of nouns or that of verbs (J. Lynch, p.c.).

However, this *correlation* between inflection type and category-specific phonology is not an *explanation*. For example, in Spanish or Mono, it is true that verb stress or tone is entirely determined by the inflectional paradigm (§2.1.1). However, just because verbs take inflectional suffixes does not preclude the logical possibility that verb roots might have underlying stress or tone contrasts (which might emerge in some particular inflectional form). That this is often not the case is requires explanation; apparently, the phonological grammar does need to enforce the lack of contrast in verbs as a property separate from the fact that individual verbal inflectional morphemes happen to assign stress or tone.

Furthermore, languages like Mandarin, Hebrew, and Finnish (see §3.2) show that adjectives sometimes behave differently from both nouns and verbs — even if they have N-type inflection, as in Hebrew and Finnish.

4.3 Prosodic structure

Some apparent category-specific effects can be attributed to prosodic structure. For example, in Digo (Narrow Bantu; Kisseberth 1984), tones originating with the verb may end up on a following noun. However, Kisseberth shows that this is caused by phrase-level tonal phonology; verb tones surface on syllables within the noun because tone-assignment rules refer to the right edges of phonological phrases.

Kelly (1988) argues that the different stress preferences for disyllabic nouns and verbs in English (§2.4.1) originate in their syntactic and prosodic contexts; nouns prefer initial stress because they are typically preceded by an unstressed determiner, and sequential alternation between stressed and unstressed syllables is desirable. Verbs occur in a distinct syntactic and prosodic context, so they prefer final stress.

While explanations based in prosodic structure may cover some apparent cases of category-specific behavior, however, this approach cannot handle all the diverse cases discussed in §2 and §3.

4.4 Morpheme-specific effects

Whether or not they have category-specific phonology, languages generally have morphemes or morpheme classes that exhibit exceptional behavior (Saciuk 1969). So, are category-specific effects meaningfully distinct from morpheme-specific effects? Is there a qualitative difference between assigning certain morphemes a phonology-relevant feature named "[–native]," and assigning certain morphemes a phonology-relevant feature named "[+noun]"? While "[–native]" and "[+noun]" might participate formally in the phonological grammar in much the same way, there are arguably important differences between the two. First, lexical categories do, obviously, have significance outside the phonology. If items of the same morphosyntactic category also pattern together phonologically, then allowing the phonology to use the morphosyntactic label captures a generalization that would be missed if an arbitrary, phonology-specific feature were invoked instead. Second, to the extent that the privilege scale N > A > V (§2-, §3) is a linguistic (near-)universal, using the morphosyntactic category labels to demarcate phonologically relevant classes predicts their relative ability to support phonological contrast in a way that using arbitrary phonological labels does not.

4.5 Summary: Alternatives to category-specific phonology

While there are instances of category-specific behavior that may be accounted for by morphological, prosodic, or other factors, there remains a core of cases that do appear to require reference to lexical category within the phonology.

5. Conclusions

In this examination of category-specific phonological phenomena, a number of patterns have emerged. Many, although perhaps not all, cases are consistent with a universal scale of phonological privilege, N > A > V. Furthermore, the overwhelming majority of cases involve prosodic and suprasegmental phenomena rather than segmental or featural phenomena. Finally, there appear to be correlations between phonological behavior and type of inflection, seen especially in the case of adjectives. However, purely morphological or prosodic factors do not provide adequate accounts for all instances of category-specific phenomena, indicating that the phonological grammar must be able to refer to lexical categories.

In addition to phonology, there are other ways in which lexical categories show differences beyond morphosyntax, especially in child language acquisition and in psycholinguistics; for recent reviews, see, e.g., Ogura et al. (2006) or D'Odorico & Fasolo (2007) for acquisition, and Rapp & Caramazza (2002) or Mätzig et al. (2009) for psycholinguistic evidence from aphasic speakers. Perhaps future research will uncover ways in which category-specific phonology is related to other sources of differentiated behavior among words of different categories.

The full array of facts about category-specific phonology — including the "intermediate" status of adjectives; the fact that nouns are more likely to be phonologically privileged than verbs, but in some languages, both nouns are verbs are subject to equally predictable but nevertheless distinct requirements; and the fact that category-specific phonological differences often parallel, but do not fully match, other differences between categories such as free-morpheme status — have not yet been captured by any single theoretical approach, including noun faithfulness (Smith 1997, 2001) and the various implementations of base identity or paradigm uniformity (e.g., Shiraishi 2004; McCarthy 2005; Cable 2005; Bobaljik 2008). An intriguing challenge remains for phonological theory.

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