30 Slave (Northern Athapaskan)

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Athapaskan languages are of great interest to the linguist concerned with morphology, presenting numerous intricate and complex problems. As a sketch is limited in space, in-depth discussion of all the morphological problems raised by languages of this family is impossible. My goal here is to focus on a small set of the problems raised for theories of morphology by a single Athapaskan language, Slave.[1] I do not present definitive analyses, but rather outline analyses which, I hope, will provide linguists interested in the problems of languages of this family with direction for further research.

The structure of the Athapaskan word, especially of the verb, is complex, and has received the lion's share of attention from early times (e.g. Golla 1970; Hoijer 1946; F-K. Li 1930, 1946; Morice 1932; Sapir and Hoijer 1969) to more recent times (e.g. Cook 1984, 1989; Hargus 1988, 1991; Kari 1976, 1989, 1990, 1992, 1993; McDonough 1990; Randoja 1989; K. Rice 1989; Speas 1986, 1990, 1991b; Tenenbaum 1977; Wright 1983, 1986). In this sketch, I too focus on the structural properties of words, examining some problems of the noun briefly and some problems of the verb in greater detail.

Athapaskan languages have been analysed as exhibiting a range of quite unusual structural properties, some of which are listed in (1):

(1) (i) A template, or position-class analysis, appears to be required for both the noun and the verb.
(ii) Inflectional morphemes appear to be ordered linearly inside derivational morphemes in both the noun and the verb.
(iii) Phonological rule domains are apparently arbitrary and unrelated to morphosyntactic properties, and must be stipulated in lexical entries.
(iv) Discontinuous dependencies between morphemes exist within the verb.
(v) Two positions for subject markers are found within the verb.

In the following sections, I examine some of these structural properties in nouns (section 1) and verbs (section 2), suggesting ways in which they might be reconciled with theoretical ideas about the nature of morphological structure.

1 Nouns

The noun system of Athapaskan languages has received remarkably little attention in the literature (for some exceptions, see Hargus 1988, K. Rice 1989, Young and Morgan 1987), probably due to the extreme complexity of the verb. However, nouns too are interesting in many ways, and are worthy of brief discussion.

1.1 Background

Nouns in Slave can be divided into a number of categories based on structural properties (see K. Rice 1989). The nouns of concern here are stem nouns and compounds. Stem nouns consist, as their name implies, of a stem alone. These nouns often have related verb stems (2), but need not (3). They are generally monosyllabic (2, 3), although they may have a vocalic suffix -ɛ (4).[2,3]

(2)	dzéh	'gum'	-dzég-é	'be gummy, sticky' (H)
	shį	'song'	d-shį	'sing' (SS, B)
	seh	'saliva'	-seh	'spit'
	t'éh	'charcoal'	-t'éh	'cook (imperfective)'
	tsih	'ochre'	-tsil-e	'be red'
	xáh	'club'	-xáh	'club'

(3)	ʔah	'snowshoe'
	mbeh	'knife' (SS)
	tthah	'carrot' (SS)
	du	'island' (B, H)

(4)	t'er-ɛ	'girl' (B, H)
	ts'al-ɛ	'frog'
	lug-ɛ	'fish' (H)

Compounds of two types exist. The first, which I will term 'possessive compounds', have meanings of the following sorts: belonging to, used by, used for, associated with, consisting of. Some examples are given in (5). The second type of compound, which I term 'non-possessive compounds', have a uniform meaning, N2 made out of N1. This type is exemplified in (6). I have written compounds as two words for ease of distinguishing the morphemes involved.

(5)	ta ghú	'white cap'	ta 'water' + ghu 'tooth' + ɛ́ 'possession'
	tɛh tʼǫ́	'water lily'	tɛh 'water' + tʼǫ́ 'plant'
	dlǫ bɛ́rɛ́	'cheese'	dlǫ 'mouse' + bɛ́r 'food' + ɛ́ 'possession' (H)
	tɬʼá ʔe	'pants'	tɬʼá 'bottom' + ʔe 'clothing'
	mɛ́h dǫ	'food bag in grouse'	bɛ́h 'stomach' + dǫ 'storage area' (SS)
	jíyɛ́ tú	'wine, juice'	jíyɛ́ 'berry' + tu 'water' + 'possession'
	sa dzéɛ́	'watch, clock'	sa 'sun' + dzé 'heart' + ɛ́ 'possession'
	tɬį tɬʼulɛ́	'dog harness'	tɬį 'dog' + tɬʼul 'rope' + ɛ́ 'possession'
(6)	kwe gohkwį	'stone axe'	kwe 'stone' + gohkwį 'axe' (B)
	satsǫ́ xóo	'wire snare'	satsǫ́ 'metal, wire' + xóo 'snare' (SS)
	xa tɛnɛ	'basket'	xa 'root' + tɛn + 'container' + ɛ suffix
	fe shíh	'stone mountain'	fe 'stone' + shíh 'mountain' (H)
	ʔɛ́dhɛ́h thɛ	'leather belt'	ʔɛdhɛ́h 'hide, leather' + thɛ 'belt' (SS)
	dɛchį ɬuh	'wooden spoon'	dɛchį 'wood' + ɬuh 'spoon' (SS)

1.2 A boundaries problem: the distribution of stem-initial fricatives

While the structure of the nouns is generally straightforward and amenable to many theories of morphology, they do present some problems. The one that I address here concerns the distribution of voiced and voiceless fricatives in noun stem-initial position. These fricatives exhibit voicing alternations in this position. Strictly phonological analyses that have been given to account for the voicing alternations (e.g. Cook 1984 on Sarcee, Kari 1976 on Navajo) are empirically inadequate. In this section I follow work by K. Rice 1988, 1991c, in suggesting that voicing alternations in nouns are attributable to the presence of a morph consisting simply of the feature [voice], an autosegment that indicates that a stem is inflectable.[4]

I begin with a survey of the distribution of voiced and voiceless stem-initial fricatives, leaving aside possessed compounds, which are discussed in section 1.3.

It is generally said in the Athapaskan literature that voiceless stem-initial fricatives occur in absolute initial position and following a voiceless segment in Athapaskan languages with voicing alternations; see, for example, Cook 1984 on Sarcee and Kari 1976 on Navajo.

The first of these observations is definitely borne out: alternating fricatives are voiceless word-initially.[5] This can be seen in (7), showing forms which

contrast stem-initial fricatives in absolute initial position with stem-initial fricatives following the possessive prefix *sɛ* 'my.'

(7)

non-possessed		possessed	
*s*eh	'saliva'	sɛ-*z*eg-ɛ́	'my saliva' (H)
*sh*ı̨	'song'	sɛ-*zh*in-ɛ́	'my song' (SS, B)
*th*ɛ	'belt'	sɛ-*dh*ɛ-ɛ́	'my belt' (SS)
ɬuh	'spoon'	sɛ-*ɬ*uz-ɛ́	'my spoon' (SS)
*s*a	'sun, month'	sɛ-*z*a-á	'my sun, month' (SS, B)
*x*ay	'year'	sɛ-*gh*ay-ɛ́	'my year, age' (H)

The second of these observations is not borne out, however: voiced fricatives occur in noun stem-initial position when the noun follows a voiceless segment, as in (8), as well as when it follows a voiced segment, as in (7).[6]

(8)

*sh*ı̨	'song'	sah *zh*in-ɛ́	'bear's song' (SS, B)
sah	'bear'		
*s*o	'frost'	dah *z*o	'frost on tree'
dah	'above'		
*s*ah	'bear'	tɛh *z*a-á	'polar bear' (H)
tɛh	'water'		

Forms such as those in (8) illustrate that voicing alternations are not phonologically transparent in nouns, as a voiced fricative occurs whenever a segment precedes, regardless of whether that segment is voiced or voiceless. These forms indicate that a solution to the problem of the environment for fricative voicing alternations must be sought somewhere other than in the phonology.

Given the surface opacity of voicing alternations in nouns, K. Rice (1988, 1991c, 1992a) proposes that the source of the stem-initial voicing is an autosegment of the form [voice], a morpheme which appears in a branching construction, as a kind of stem joiner. The following examples fully illustrate the distribution of voiced fricatives in Slave nouns.

(9) The initial fricative of a noun is voiced when preceded by a possessor, pronominal or nominal:

*x*ay	'winter, year'	sɛ-*gh*ay-ɛ́	'my age'	dɛnɛ *gh*ay-ɛ́	'the man's age' (H)
*sh*ı̨	'song'	sɛ-*zh*in-ɛ́	'my song'	sah *zh*in-ɛ́	'the bear's song' (SS, B)

(10) The initial fricative of the second noun of a possessive type compound is voiced:

sah *gh*ú	'bear tooth'	cf. *x*u 'tooth' (sah 'bear')
kwí *gh*a	'head hair'	cf. *x*a 'hair' (kwí 'head') (B)
tɛh *z*a-á	'polar bear'	cf. *s*ah 'bear' (tɛh 'water') (H)

(11) The initial fricative of a noun is voiced when preceded by a derivational prefix:

dah zo	'frost on tree'	cf. *so* 'frost' (*dah* 'above')

K. Rice (1988, 1991c) argues on the basis of data such as those in (9)–(11) that a morpheme [voice] is inserted when the construction is branching. While this explanation provides an account of the data illustrated so far, it is problematic in two ways, one of which will be considered immediately, the second of which will be discussed in section 1.3.

First, consider the second compound type, that with the meaning N2 made of N1. Such compounds present a difficulty, because, despite the branching construction, they nevertheless have a voiceless fricative beginning the second noun. Some examples, repeated from (6), are given in (12).

(12) dɛchį ɬuh 'wooden spoon' (SS)
ʔɛdhéh *th*ɛ 'leather belt' (SS)

The phonology of this compound type has received some attention in the literature, with attempts made to provide boundary-type accounts for the failure of voicing. K. Rice (1985a) argues that the compound type is phrasal, and thus escapes the criterion of branching construction. However, evidence for the phrasal nature of the compounds is weak. Hargus (1988) argues that compounds are formed at two levels in the Lexical Phonology of Sekani, another language of the Athapaskan family, with this type of compound created after voicing has ceased to apply; this account is problematic in requiring a loop to account for embedding properties of compounds. These accounts, while providing adequate descriptions, raise theoretical problems associated with boundaries (e.g. Selkirk 1980a) and loops (e.g. Sproat 1985).

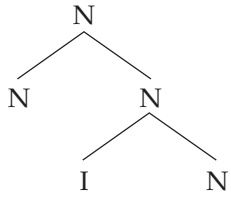
An alternative structural analysis is available, one that appeals to the semantics of the compounds. A systematic semantic difference between the two compound types is found: those of the first type involve a possessive relationship, with N1 being the possessor of N2. This is not true of the second type, which have the meaning N2 made out of N1.

One characteristic often associated with possession is inflection. It is not unreasonable to think that an inflectional element might be involved in possessive constructions, including compounds of the first type. In fact, inflection may be overt in possessive constructions, and can be present in what seem to be compounds rather than phrases. An example is given in (13), where *go*, glossed 'areal', is required in the possessive construction.

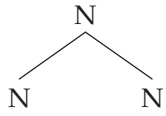
(13) kóɛ̨ gofít'a 'roof' kóɛ̨ 'house' + go- areal agreement + fí 'head' + t'a 'top' (H)

Compounds of the second type do not exhibit a possessive relationship, and no reason exists to think that they involve inflection. For instance, the second noun of such a compound is never inflected. This suggests that compounds of the first type have roughly the structure in (14a), while those of the second type have the structure in (14b), where I = inflection.[7]

(14) (a)



(b)



If this is the case, then the morpheme [voice] can be functionally identified: it must be present when inflection, null or specified, is present. Inflection is required in the possessive construction, and thus voicing is found in compounds of the first type; it is not present in the non-possessive compounds of the second type.

One type of boundary problem, that which arises from the arbitrary assignment of structure to compounds, can be solved if [voice] signals inflection, rather than being inserted in a purely structurally defined environment. The structures for the two types of compound differ, but the difference correlates with meaning differences.

1.3 A structural problem: the marked distribution of fricatives in compounds

In the possessive constructions examined so far, a stem-initial fricative is voiced, leading to the generalization that the voicing is produced by an autosegment which associates to a stem-initial fricative. When a wider range of possessed forms is examined, there is reason to reconsider this hypothesis about the distribution of [voice]. The need for this can be seen by considering the following forms, in which voicing does not occur.

(15) A stem-initial fricative is voiceless when it is the initial consonant of a possessed compound:

ɬéh-t'é	'bread'	sɛ-ɬéh-t'é	'my bread'	*-léz-ɛ́*	'flour'
ɬeh 'flour' + t'é 'charcoal'					(SS)
*s*a-dzé	'clock, watch'	s-*s*adzéɛ́	'my clock'	-za-á	'month'
sa 'sun' + -dzé-ɛ́ 'heart, possessed form'					(SS, B)
sah-dhɛ́h	'bearskin'	sɛ-*s*ah-dhɛ́h	'my bearskin'	-za-á	'bear'
sah 'bear' + thɛ́h 'skin'					(SS)

(16) A stem-initial fricative is voiceless when it is the initial consonant of a possessed deverbal noun:

*sh*ɛ́ts'ɛye sɛ-*sh*ɛ́ts'ɛyé 'meal' (cf. shɛ́ts'ɛye 'one eats') shɛ́ 'food' (incorporate that does not appear independently)

*x*ede sɛ-*x*edé 'word, language' (cf. -de 'talk') (H)

The initial consonants of the noun stems in (15) are subject to voicing, as is shown by the possessed forms in the last column. As the morphemes in the verbs in (16) do not typically appear on their own in an inflected form, it is impossible to know what their patterning would be if they did appear independently of the verb.

The discussion so far would suggest that the stem-initial fricatives should be voiced in the forms in (15) and (16) as the possessive construction is involved.[8] This construction involves inflection, and I have suggested that the presence of [voice] correlates with the presence of inflection in nouns. The absence of [voice] is thus surprising.

When the forms in which the initial fricative of the inflected noun is voiced are compared with those in which it is voiceless, a striking property stands out: when the fricative is voiceless, the word in question is polysyllabic. In the examples in (15) and (16), the word is also at least bimorphemic. However, this need not be the case. Bisyllabic monomorphemic stems, while rare, exist in Slave. When a bisyllabic monomorphemic noun is possessed, a stem-initial fricative fails to voice, as in (17).

(17)	*x*ɛníh	'raft'	sɛ-*x*ɛníh	'my raft'
	*x*ɛwi	'pus'	sɛ-*x*ɛwi	'my pus'
	*x*ali	'small sled'	sɛ-*x*ali	'my small sled' (H)
	*s*úhga	'sugar'	sɛ-*s*úhga	'my sugar'

A generalization is available: voicing fails to affect the initial of a monomorphemic stem of more than one syllable.

While [voice] marks inflection, occasions arise in which this morpheme is disallowed: namely, when the stem is not of the normal monosyllabic shape. This unusual condition makes one suspect that its absence is not random. Instead, it suggests a prosodic condition on the distribution of [voice] in nouns. When the cases in which the stem with the voiced initial fricative appears and those in which the voiceless initial stem appears are compared, a systematic difference is observable: the voiceless initial stem is found whenever more than one syllable is involved, while the voiced initial stem occurs when the inflected item is monosyllabic (save the possessive suffix). In K. Rice 1991c, I argue on phonological and morphological grounds that this two-syllable construction forms a prosodic domain of the minimal word. The distribution of [voice] can be stated as follows:

(18) (a) [Voice] is present when inflection is found with nouns (and postpositions).
(b) [Voice] is present only at a juncture within a minimal word.

In the possessive construction, the possessor and the noun form a single minimal word, and [voice] can be present. In the type-2 compounds, two minimal words are found, and [voice] does not appear between them. In bisyllabic

nouns, the stem itself forms a minimal word, and in the possessed form [voice] cannot be present, as it appears only internally to the minimal word, not at an edge.

[Voice] marks that a stem is inflectable; it is not present under the prosodic conditions that the unit with which it is associated forms a minimal word. It thus occurs at a juncture within a minimal word, but not at the edge of a minimal word.

1.4 An ordering problem: diminutive/augmentative and possession

A claim that is often made is that inflection is ordered outside derivation in word formation. In Slave, a striking counterexample is found in the noun system, with an inflectional suffix that marks a possessive construction appearing linearly inside the diminutive and augmentative morphemes. Slave nouns have diminutive (zha, ah) and augmentative (cho) forms, as in the examples in (19).

(19) ʔah 'snowshoe' ʔah-cho 'hunting snowshoe' (B, SS)
téh 'mat' téh-zha 'small mat'

The diminutive and augmentative morphemes follow the noun stem.

A problem arises when possessed diminutives and augmentatives are considered. These forms include an inflectional possessive marker -ɛ́, which is ordered linearly inside the diminutive and augmentative markers, as in (20).

(20) -ʔah-ɛ́-cho 'hunting snowshoe, possessed form' (SS)
-tél-ɛ́-zha 'small mat, possessed form'

These constructions appear to be highly problematic, since inflection is ordered linearly inside derivation.

Facts indicate that the diminutive/augmentative suffixes are not part of the minimal word. Recall that when a minimal word is possessed, voicing of a stem-initial fricative fails to occur. In possessed diminutive and augmentative forms, voicing is found, as in (21).

(21) non-possessed possessed
*sh*ı̨-ah -*zh*in-ɛ́-ah 'small song, ditty' (SS)
*ɬ*uh-cho -*l*uz-ɛ́-cho 'tablespoon' (SS)

Assuming the conclusion of the previous section, that voicing is prohibited when the stem is a minimal word, the suffixes in question cannot form part of the minimal word.

The minimal word provides an elegant solution to this problem. It appears that the possessive suffix has a bipartite environment. First, it attaches to a

noun that is inflected. This condition, while necessary, is not sufficient, since it would place the suffix on the outside of the diminutive and the augmentative. The prosodic condition corrects this: in addition to attaching to an inflected noun, this suffix must attach to the minimal word. The inflectional suffix then has a well-defined position environment. While it normally appears at a word edge, in those cases where a derivational suffix that is not integrated with the stem into the minimal word occurs, the inflectional suffix appears to be infixed between the stem and the augmentative/diminutive. The infixation is not genuine, however, but merely a consequence of suffixation to the prosodic word.[9]

1.5 Summary

While the noun has not been the object of intensive study, it has properties of interest. First, it indicates that the notion 'inflectable' is important in the language for determining the distribution of a morpheme. Second, it shows that in addition to morphosyntactic conditions on morpheme placement, prosodic conditions may also be required.

2 The verb

2.1 Background

The structure of the Athapaskan verb has been the topic of enormous study (see references in the second paragraph of the chapter). The verb is complex, and presents a myriad of problems for most theories of word structure. In this section I summarize a traditional view of the verb; this serves as a background against which to examine a number of the areas of study.

The Athapaskan verb is traditionally thought to consist of a single word, composed of a stem and a number of prefixes. The stem itself is complex, consisting of a root followed by a suffix that indicates mode and aspect.[10] The order of prefixes is determined by a template, or position-class model. Thus, morphemes occur in a fixed order, and are lexically marked for the position in which they occur. In addition, each morpheme is lexically marked for phonological boundary type. A template for Slave is given in (22). The template includes verb-prefix positions, boundary types and a labelling of the traditional inflection/derivation categorization of morphemes in the position.

(22) preverb#distributive#iterative#incorporate#direct object %deictic
D D D D I I
subject % gender+secondary aspect+primary aspect+subject [voice+stem
D D D/I I

A brief description is in order. Several phonological boundaries are indicated. The symbol '#' represents a strong boundary type, marking what are traditionally called 'disjunct morphemes'.[11] The second symbol, '+', indicates a regular boundary type. It separates what are traditionally called 'conjunct morphemes', a span that includes some items considered to be derivational and others considered to be inflectional. The third symbol '%' is associated with the direct objects and deictic subjects. These morphemes are intermediate in phonological pattering between the disjunct and the conjunct. Finally, the symbol '[' separates the voice morpheme and verb stem from the remainder of the verb.

I will briefly describe the content of each position, beginning at the right edge.

The stem is obligatory, supplying the major event, action or state.

The morpheme labelled 'voice' is traditionally called the classifier. It productively marks voice or valency, but is lexicalized in many cases. For example, while transitivity is often marked by a morpheme *h* (*ɬ) in this position (e.g. ɬánįwɛ 's/he died' (B) with a null voice marker versus O ɬánį*h*whɛ 's/he killed O' (B) with the *h* voice marker), there are transitive verbs that do not include this morpheme (e.g. ráyɛrɛyįtá 's/he kicked him/her' (H), with a null voice marker), and the morpheme may be present in intransitives (e.g. k'ɛ*h*tɬóh 'it (meat, fish) is soft' (SS), whɛ*h*chú 'cloth-like object is located' (B), with *h*).

The subject holds overt morphemes marking person and number: first-person singular, second-person singular, first-person dual/plural, and second-person dual/plural.

Primary aspect indicates the primary aspect of the verb – imperfective, perfective or optative – while secondary aspect marks aspects that combine with the primary aspects; these include inceptive, semelfactive, conative, transitional and others (see Cook 1989 for a similar distinction). What I term 'primary aspect' is often divided into two positions, conjugation and mode (e.g. K. Rice 1985c, Rice and Hargus 1989). Perfective and optative are overtly marked in primary aspect position, while imperfective is unmarked. The morphemes called 'conjugation markers' are found in every verb form (they have overt forms *y, n, w*; a null form is considered present if there is no overt morpheme present). Each verb requires a particular conjugation pattern, or set of conjugation markers, for the imperfective, perfective and optative. Conjugation pattern is determined in two different ways, both of which are linked to semantic properties of the verb. First, verbal lexical entries fall into a range of semantically defined classes called verb theme categories (i.e. categories that unify the verb themes, or underlying lexical entries; see below). If the verb surfaces as an inflected lexical entry, the conjugation pattern is decided by the semantics of the verb theme category. For instance, verbs of motion require the conjugation pattern *n* imperfective, *n* perfective, *n* optative, while those involving sustained actions over time require ∅ imperfective, *y* perfective, ∅ optative. Second, preverbs and secondary aspectual morphemes are

conjugation choosers, and determine the conjugation pattern for a verb. Again, the semantics of the conjugation chooser is linked to the particular choice of conjugation marker. For example, the adverb *dah* 'up on to a horizontal surface' requires *w* imperfective, *w* perfective, *w* optative conjugation marking; the adverb *ká* 'out from inside' requires ∅ imperfective, *y* perfective, ∅ optative conjugation marking; and the secondary aspectual marker *d* 'inceptive' requires ∅ imperfective, *w* perfective, ∅ optative conjugation marking. The iterative and distributive also select conjugation patterns.

The conjugation–primary aspect–subject portion of the verb combines in ways that are not always predictable. For instance, the first-person singular subject has the form *h* except in the perfective of ∅ and *h* voice-element verbs, where it is *i*. While it is possible to assign the morpheme *h* the meaning 'first-person singular subject', the morpheme *i* includes more than one meaning: namely, first-person singular subject/perfective primary aspect. The optative is predictably *u* or *wo-* except when the conjugation marker is *n* or *w*, when it is *'wo* or *wo* (the acute accent indicates that a high tone falls on the vowel of the preceding syllable). Other morphemes show similar patterns. While the second-person singular is regularly nasalization in certain environments, in ∅ and *h* voice-element perfectives it has the form *ne* in these environments. The third person exhibits similar allomorphy, with an unusual form in the perfective of ∅ and *h* voice-element verbs. *n* and *w* conjugation optatives also display unexpected patterns. The non-systematic combinations of conjugation–primary aspect–subject suggest that in at least some cases this stretch of the verb should be treated as a single unit, or portmanteau morph, with complex meaning, as proposed, for instance, by Anderson 1982 for Georgian and by E. Williams 1981b for Latin.

Gender morphemes, generally viewed as derivational prefixes, include *d* 'fire', *d* 'benefactive', *d* 'by mouth', *n* 'mind, feeling', *n* 'water', *y* 'dual subject'. These morphemes marked gender historically. Some are productive; for instance, *d* 'by mouth' occurs in a wide range of verbs having to do with noise; examples include 'whistle', 'snore', 'burp', 'sit', 'bark', 'cough', 'squeak', 'ask', 'whine, fuss', 'argue', 'defend (help with words)', 'walk laughing, crying, etc.', 'joke (tease with words)', 'win with words'. Others occur in restricted circumstances. For example, *n* occurs in verbs meaning 'handle unspecified object (water) on object; wash' and 'handle in water'. Without *n*, the meaning of the verb does not include the concept of water. The prefix *y* is found in certain verbs with a dual subject (e.g. 'dual arrive'); however, it is not generally found even when the stem requires a dual subject. I also include under the rubric of 'gender' morphemes which always occur with a particular verb stem; these are usually termed thematic in the Athapaskan literature, and are part of the underlying representation of the lexical item. For instance, the basic lexical entry for the verb 'handle singular object (uncontrolled)' includes the morpheme *y*, with every derivative based on this lexical entry requiring this morpheme.

While in general, gender precedes secondary aspect, as in (22), the ordering may be overridden by phonological constraints. In Slave, the ordering of these morphemes is *u, y* gender, *d, n, y* secondary aspect, *í*. See Hargus 1988 on Sekani, Kari 1989 on Ahtna, Kari 1993 on several Alaskan languages, K. Rice 1989 on Slave, and Speas 1986, Wright 1986 and McDonough 1990 on Navajo.

The so-called deictic subjects are two in number. The morpheme *ts'* indicates a human subject unspecified for number, while the morpheme *k/g* (the form varies depending on dialect) indicates a human plural.

Direct-object morphemes mark the person and number of the direct object.

The disjunct complex consists of three major categories. Incorporates are of two types: internal arguments, including both objects and subjects (K. Rice 1991a, Rice and Saxon 1994), and some adverbials. The meaning of the verb with an incorporate differs in systematic ways from the meaning of the verb without it; see Axelrod 1990 and K. Rice 1991a for discussion.

Two quantificational adverbs are found in Slave. The distributive can quantify the subject, the object, the location or the event. The iterative quantifies the event or object, indicating that an action is habitual or repeated, depending on other morphemes present within the verb. These are divided into two positions in most Athapaskan literature.

Preverbs, traditionally called incorporated postpositions and adverbs, represent oblique relations and manner. See Kari 1989, 1990, and K. Rice 1991b for details. Typical meanings of preverbs include 'around', 'away', 'up on to', 'out of', 'across', 'to a point', 'into fire', 'into air', in half', 'to pieces', 'excess'. While the meanings of many of these morphemes are transparent, with some the meaning is defined only in combination with the verb stem. Preverbs can be intransitive or transitive, and more than one is possible in a particular verb word.

The minimal lexical entry of a verb is generally considered to be a 'verb theme' rather than a stem (or root). 'Verb theme' is a technical term referring to the stem, a voice element (perhaps null), and whatever other morphemes are required with that stem; these may be preverbs and gender morphemes. Some verb themes are given in (23).

(23) (a) d-dǫ 'drink'
voice–stem

(b) d-l-wɛ́ 'sg. fall' (H)
gender–voice–stem

Word formation involves several distinct stages. In the first stage, a level called the 'verb base' is formed. At this level, derivational affixes are added to the verb theme. These include preverbal, gender and secondary aspectual items. Some sample bases formed on the themes in (23) are given in (24). Verb words are also shown; this is the base plus inflectional items; see the discussion below.[12]

(24)	(a)	verb theme	d-dǫ	'drink (object)'
		verb word	hɛdǫ	's/he drinks (object)'
		verb base	tɛ-d-d-dǫ *preverb – sec. asp. – voice – stem*	'drink to excess'
		verb word	tɛdɛ́hdǫ	's/he drank to excess' (H)
		verb base	n-d-dǫ *sec. asp. – voice – stem*	'get full of (food)'
		verb word	ʔɛnɛ́hdǫ	's/he is full (of food)' (SS)
	(b)	verb theme	d-l-wɛ́ *gender – voice – stem*	'fall'
		verb base	ká-d-d-l-wɛ́ *preverb – gender – asp. – voice – stem*	'fall out'
		verb word	kádɛdɛ́hwɛ́	'she/he/it fell out' (H, B)
		verb base	tɛh-d-l-wɛ́ *preverb – gender – voice – stem*	'fall into water'
		verb word	tɛdɛ́wé	's/he fell into water' (H, B)
		verb base	ch'a-tthí-d-l-dhɛ́ *preverb – 'head' – gender – voice – stem*	'fall and bump on head'
		verb word	zhɛch'atthídɛ́dhé	's/he$_i$ fell and bumped his/her$_i$ head' (SS)

At the final stage of word formation, the verb word is produced. At this level, inflectional affixes are present (e.g. subject, object markers, conjugation and primary aspect[13]), and the formation of the verb word is complete. (See Kari 1979, 1990, 1992, for a far more highly articulated model of word formation in Ahtna, an Athapaskan language of Alaska.)

This traditional model of word formation includes three levels commonly assumed in word formation (although with unusual names in the Athapaskan literature): verb theme (basic lexical entry), verb base (verb minus inflection), and verb word (inflected verb). Such a model of word formation is proposed to account for paradigmatic properties of the Athapaskan verb. It results in making Athapaskan verb formation like word formation in other languages, with derivational morphology preceding inflectional morphology.

Given this model of word formation and the boundaries in (22), it is evident that word formation and phonology do not take place in tandem, as the phonological domains are not defined until the verb word is formed (see Hargus 1986 for comments). Because of this lack of isomorphism between word formation and phonology, the Athapaskan literature recognizes two models of the verb. One (theme, base, word) accounts for morphological structure, allowing for derivation to precede inflection. The second (boundaries) accounts for the phonological structure of the verb. This second type of structure is

coded as boundary symbols (or some other diacritic) on the lexical entry of the affixes.

With this background, I am ready to turn to some of the theoretical problems posed by the Athapaskan verb. The issues that I raise are, I believe, problems that must be dealt with by any theory of morphology. However, the solutions that I frame are basically within a government-binding framework. My basic proposal is that the traditional verb word is a syntactic rather than a lexical unit. If this is the case, then some of the apparently odd properties of the verb given in (1) take on a different complexion, and the verb is far less unusual typologically than it initially appears to be.

2.2 *An ordering problem: the ordering of inflection and derivation*

It is often proposed as a linguistic universal that inflection, defined as what is relevant to the syntax, appears outside derivation (e.g. Anderson 1982, 1988b). Athapaskan languages are often cited as counterexamples, with derivation appearing outside inflection. In this section I examine this problem, suggesting that the concern is misplaced with respect to Slave. When the overall structure of the verb is considered, the generalization can be drawn that clearly inflectional material does occur outside derivational material. In this section I restrict discussion to the traditional conjunct morphemes, ignoring disjunct material (see section 2.6).

To reiterate, the conjunct portion of the verb is generally assigned a structure similar to that in (25). The labels I (inflectional) and D (derivational) represent the word-formation category in which the position class is usually thought to fall.

(25) direct object – deictic subject – gender – secondary aspect –
I I D/I D
primary aspect – subject
D/I I

Given the labels in (25), inflection and derivation appear to be hopelessly intermingled, with apparently no generalizations about their ordering available.

While (25) appears to present an insoluble ordering problem, the criteria used for labelling morphemes as inflectional or derivational are not generally addressed in the Athapaskan literature. Thus, before turning to the details of the Slave verb, I establish criteria to distinguish inflection. Morphemes can be established as inflectional in several ways. First, inflectional items are syntactically active, while lexical items are not.[14] In determining which items are syntactically active, I follow Anderson (1982, 1988b), who argues that syntactically active items show configurational, agreement, inherent (e.g. gender) and phrasal properties. Second, inflectional items are obligatory, or paradigmatic,

being marked each time a category to which they apply appears (Anderson 1982; Bybee 1985: 27). Lexical items, on the other hand, are not obligatory in this sense. Third, inflectional items can combine to form portmanteau morphemes with more than one element of meaning in a single entry. Lexical items do not combine with each other or with inflectional items (see Anderson 1988b). Finally, inflectional classes are normally closed classes, while lexical classes tend to be open.

These criteria can be used to establish the following categories in Slave: the traditional disjunct morphemes are lexical items (I call them this rather than derivational, as I suggest that the verb is a syntactic phrase rather than a lexical word; see section 2.4), and the traditional conjunct morphemes are inflectional items.

In the following discussion, I review the evidence for this categorization.

2.2.1 Pronominal subject agreement Saxon (1986) argues that the pronominal elements of Dogrib, a language closely related to Slave, represent inflection: in particular, agreement between a noun phrase and the clausal element upon which it depends syntactically. The primary evidence for this is that subject marking is obligatory, being present whether a specified noun is present or absent. The evidence adduced by Saxon for pronominal subjects representing agreement in Dogrib is found in Slave: these morphemes are obligatory, and function paradigmatically. In addition, as discussed in section 2.1, the subject markers combine with aspect morphemes to yield portmanteau forms, another diagnostic of their inflectional nature. See also Rice and Saxon 1994 for discussion.

2.2.2 Primary aspect Anderson (1982) points out that tense/aspect play an important role syntactically, so one might expect these morphemes to be of syntactic relevance. There are reasons in Slave to consider primary aspect morphemes as inflectional. First, co-occurrence restrictions exist between primary aspect and aspectual category-assigning morphemes which follow the verb: if the verb stem is optative, then the optative morpheme must be present in primary aspect position, and so on. Second, co-occurrence restrictions exist with other postverbal material. For instance, an imperfective verb combines with the postverbal particle *gha* to yield a future. The optative combines with the postverbal *sáná* to give a prohibitive meaning. If the postverbal particles are higher predicates (K. Rice 1989), it is possible to view this as selection of primary aspect by a higher verb, a configurational property. Third, primary aspect is an obligatory part of the verb, again an indication that it is inflectional. Finally, the subject and primary aspect morphemes combine to form portmanteau morphs, suggesting that each of the components is inflectional.

2.2.3 Conjugation Although I have treated primary aspect and conjugation together, I will briefly discuss the inflectional status of conjugation. Two facts suggest the inflectional nature of these morphemes: first, they are obligatory; second, they combine with primary aspect and subject in unpredictable

ways, suggesting that a single morpheme may include the meaning conjugation, primary aspect and subject. Again, since inflectional morphemes form portmanteaus only with other inflectional items, this suggests that these morphemes must be inflectional.

2.2.4 Secondary aspect These morphemes show co-occurrence restrictions with temporal adverbs that are clearly outside the verb, and they are required in order to yield the particular meaning. For instance, the inceptive, which marks a point in time, does not occur with an adverb indicating a span of time. In addition, some of these morphemes combine in unexpected ways phonologically with the conjugation markers and subject pronouns. These combinations can be treated as portmanteau morphs, providing evidence for their inflectional nature.

2.2.5 Gender The morphemes that I have labelled 'gender' are normally considered to be derivational. These items have some non-local correlates, as discussed in section 2.1, in that dependencies between them and verbal arguments exist. Given this, they appear to be inflectional. In addition, they show the same unpredictable patterns of combination, with subject, conjugation and primary aspect as secondary aspect morphemes. While these morphemes have non-local properties, they are not found with every verb that has a particular item as an argument. The gender morphemes appear to have been productively inflectional historically, showing regular agreement with a verbal argument; however, it is not clear that this is the case synchronically. I consider gender morphemes to be inflectional, understanding that problems exist with this definition.

The two non-disjunct classes yet to be discussed are deictic subject and direct object. I postpone discussion of these until section 2.5. Additionally, there are two disjunct morphemes whose semantics might suggest that they have inflectional properties: the distributive and the iterative. These do not meet the criteria for inflection; see section 2.6. Finally I have not discussed the voice morphemes. In their productive use, these supply argument structure; in their non-productive use, they are listed as part of the lexical entry. As argument structure is determined by the verb, they appear to be part of the lexical entry in this way as well.

If the conclusions of this section are correct, the problem that I began with – that inflection and derivation are intermingled in the conjunct span of the verb – disappears: the morphemes in this portion of the verb all function inflectionally.

2.3 *An ordering problem: the need for a template for the conjunct morphemes*

I have suggested that the conjunct morphemes (with deictic subject and direct object yet to be considered) are inflectional, in that they exhibit configurational

properties, are obligatory, and can enter into portmanteau formations. I now address the ordering of these elements, examining whether it is a language-particular property or follows from more general principles.

Two perspectives have been proposed in the Athapaskan literature on the ordering of the conjunct morphemes, One, elucidated in the greatest depth by Kari (1989, 1990, 1992, 1993), is that the ordering of elements is stipulated by a template. Kari argues that a template accounts for the rigidity of the ordering and the idiosyncrasies of ordering of gender and aspect. He argues that the conjunct morphemes divide into three major zones: a qualifier zone, a conjugation zone and a subject zone. The first two of these zones are complex in structure, containing several positions whose ordering is again stipulated by the template. The second proposal, that of Speas (1991b) and K. Rice (1993, forthcoming) attempts to provide a semantically based account of the ordering of conjunct morphemes for Navajo and Slave, respectively. It is this model that I shall pursue; however, see note 15 for discussion of how the models may be more compatible than originally appears.

If the ordering of morphemes is predictable, there must be a principle that determines the ordering. In this section I assume that the order of morphemes is a reflection of scopal properties (e.g. Baker 1988a, Speas 1991b, K. Rice 1993). I return to discussion of this in more detail in section 2.6.

With this hypothesis in mind, I turn to an examination of the ordering of the inflectional elements in Slave. I use the term 'scope' in the following discussion; by this I mean something similar in nature to Bybee's (1985) term 'relevance to the verb'.

When the position of the verb stem (as well as of direct object and number) is ignored, the following order of conjunct morphemes is found.

(26) gender – secondary aspect – conjugation/primary aspect – subject

The subject morpheme, which occurs on the right edge of the inflectional complex in Slave, can be viewed as being relevant to an entire sentence (e.g. Speas 1991b); if ordering is a consequence of scope, one might expect to find it appearing on an edge. It is also not relevant to the verb (see Bybee 1985), another reason why it might be at an edge away from the verb (see below).

Aspect may be seen as having scope over the verb, being relevant to the verb in a way that the subject generally is not. Properties of the predicate can affect primary aspect and conjugation: for instance, preverbs and quantificational adverbs play a role in conjugation choice; some verb stems include inherent number, which can have an affect on conjugation choice as well.

Primary aspect is required, while secondary aspect is not, and some secondary aspects occur with a restricted range of primary aspects; it thus appears that primary aspect has scope over secondary aspect. Secondary aspect, like primary aspect, has relevance to the verb; for instance, adverbial and preverb types can affect secondary aspect.

Gender generally represents concord with non-agentive thematic roles, or non-subjects, so it is not unreasonable to think of this morpheme as having scope over the direct object, but not over other inflectional material.

Based on these criteria, the overall ordering of the Slave inflectional morphemes appears to be a consequence of their scopal properties.[15] Strikingly, the order of elements found in Slave does not appear to be unique to Slave, or to the Athapaskan family. In work on the ordering of inflectional elements, Speas (1991b) examined six languages (English, French, Modern Greek, Finnish, Basque, Navajo), and found the morpheme order in (27) to be similar across languages.[16]

(27) subject agreement – tense – aspect – object agreement – voice – verb

The languages that Speas discussed do not have gender, so the models are not directly comparable. However, it is notable that the order of Slave inflectional elements may not be unique to this language, but may be found cross-linguistically. If this is true, a language-particular statement of scopal relationships is unnecessary and the order of inflectional items in Slave follows from a theory of ordering that is part of universal grammar.

2.4 *A structural problem: the structure of the inflectional complex*

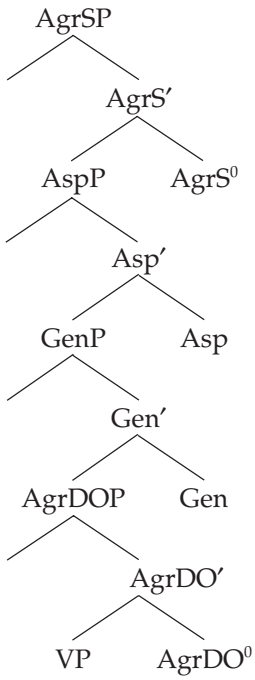
I now turn to the structure of the verb. A controversial question concerns the structure of the inflectional complex and the position of the stem. Speas (1991b) and K. Rice (1993) argue that inflectional categories project phrasally in Navajo and Slave respectively, following work by Chomsky (1988) and Pollock (1989). Their reasoning is that since inflectional morphemes are syntactic in nature, they should be accessible to the syntax; this is achieved by making them syntactic, rather than lexical, objects. Most other Athapaskan linguists (e.g. Hargus 1988; Kari 1990, 1992; McDonough 1990; Randoja 1990) propose that all word formation is lexical. This hypothesis has to deal with the syntactic accessibility issue; access to inflection can be achieved in other ways than through phrasal projections; an alternative involves percolation conventions (see e.g. Lieber 1992).

I adopt a version of the syntactic position. I assume, following, for example, Anderson (1992) and Chomsky (1993), that inflectional items are available to the syntax as features, and, with Anderson (1992), that the morphological form is supplied post-syntactically. Some evidence for this comes from the existence of portmanteau forms. In the aspect–conjugation–mode span of the verb, some morphs consist of a single component of meaning (e.g. first-person singular), while others contain more than one component of meaning (e.g. first-person singular perfective). Portmanteau patterning is suggestive of post-syntactic insertion, as otherwise rules are required to provide just these affixes with their surface form. The fact that there are phonological or templatic criteria that override the basic syntactic/semantic ordering of gender/secondary aspect

also suggests that more than principles of syntax alone are at work. Syntactic ordering tends to be determinable by a set of principles, principles that do not predict the actual orderings of the gender and secondary aspect morphemes that occur.

Given this, the inflectional complex (ignoring for the moment deictic subjects) has the syntactic structure in (28).

(28)

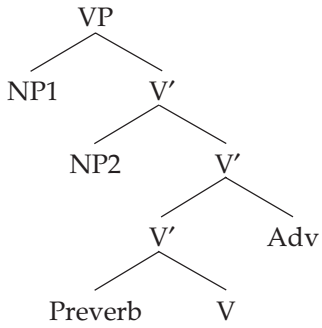


(28) provides full structure; post-syntactically, strictly adjacent positions (e.g. primary aspect–subject, gender–aspect–subject) may be spelled out as a portmanteau form. Portmanteau morphs combine meanings of adjacent positions only, never non-adjacent ones (e.g. secondary aspect–subject when there is an intervening overt primary aspect).[17]

Of interest is the comparison of (28) with the surface order of morphemes in (22). This comparison shows that morpheme order in the verb matches c-command relations in clause structure, with left-to-right ordering reflecting a lower-to-higher hierarchical arrangement.

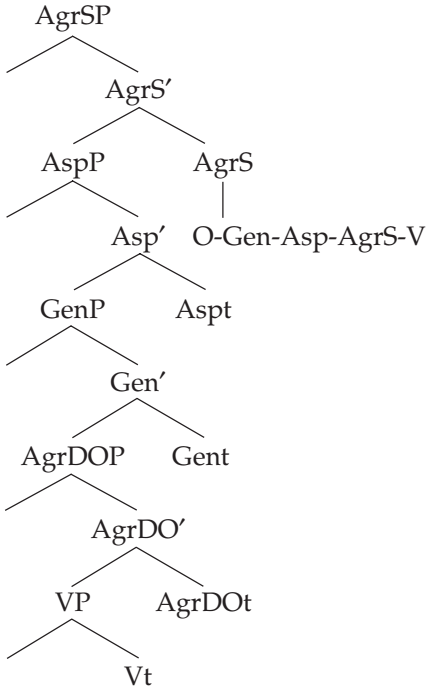
Having examined the internal structure of the inflectional complex, I now focus on VP-internal structure. I suggest, following Rice and Saxon 1994, that a Slave sentence has the structure shown in (29). The two VP-internal NPs represent subject and object arguments; see K. Rice 1993; Rice and Saxon 1991, 1994; and Saxon and Rice 1993 for arguments that all subject NPs originate in a VP-internal subject position in Athapaskan languages. In addition, the VP houses preverbs and quantificational adverbs.

(29)



The major discrepancy between (22) and (28/29) is the position of the verb stem, the syntactic head of VP. This positioning of the verb is appropriate (see K. Rice 1993). While the verb originates within the VP, this is not its surface position: it is in the rightmost position in the verb in the surface form. I take the positioning of the verb to be the major idiosyncrasy of the verb structure in the language, and derive the surface placement of the verb stem by verb raising. I will assume that raising works in the following way.[18] The verb raises from its position in the VP to the lowest functional head, AgrDO. This affixes to the verb by prefixing it. This unit then raises to the next functional head; it then affixes to the left of the verb stem, producing the order AgrDO–Gen–V. Again the unit raises, and again affixation is to the verb stem. In this manner, the tree in (30) results.

(30)



See K. Rice 1993 for additional discussion, and Speas 1991b for further discussion of ordering problems raised by the Navajo verb.

2.5 A duplication problem: two subject positions

So far, I have ignored two morpheme types: direct object and deictic subject. In this section, I attempt to deal with these through an examination of another problem: the need for the two subject positions, labelled 'subject' and 'deictic subject', in (22). I will suggest, following Rice and Saxon 1994, that the content of these positions is actually rather different: the subjects are, as discussed in section 2.1, agreement markers that indicate person and number; the deictic subjects, on the other hand, mark number but not person.

2.5.1 Inflection revisited A major area of debate in the Athapaskan literature concerns whether pronominal elements have the status of agreement, or inflection, or of arguments. Saxon (1986) argues that all pronominals represent agreement, while nouns are arguments. Sandoval and Jelinek (1989) argue that all pronominals are arguments, while nouns are adjuncts. Speas (1990) argues that most pronominal elements are agreement, but that at least one object pronoun is an argument. Tuttle (1993) proposes that object pronominals are arguments; she takes no position on subjects. Rice and Saxon (1994) argue that all subject pronominal elements are inflectional, but differ with respect to the type of inflection that they represent. Thus, a wide range of opinions is represented in the literature.

I follow Rice and Saxon (forthcoming) in the view that the pronominals fall into two inflectional classes: agreement and number. The first- and second-person subjects (section 2.2) and the first- and second-person objects (section 2.6) represent agreement, or AgrS, while the deictic subjects k/g and ts' (this section) and the third-person objects (section 2.6) are categorized as number, or Num.

Before examining the arguments for the division between agreement and number, I consider briefly the semantics of the different subject morphemes. The first- and second-person subjects are marked for features of person and number. In addition, they are human, specific and definite. The third-person subjects are more diverse in nature. In addition to the two deictic subjects, it is generally said that third-person singular in Athapaskan languages is marked by a null morpheme. Rice and Saxon (1994) assign the following features to these forms:

(31)

	k/g	ts'	∅
Number	plural	± plural	± plural
Gender	human	human	± human
Specificity	specific	non-specific	specific
Definiteness	± definite	± definite	± definite

Rice and Saxon (1994) provide several arguments for treating first- and second-person subjects as agreement and third-person subjects as number. As they point out, third person becomes a misnomer for these subjects, as they do not represent person, but are unmarked for person; I continue to use the term 'third person', recognizing that it is not appropriate. In the following discussion, I review some of Rice and Saxon's arguments for treating third-person subjects as a category different from subject agreement.

Rice and Saxon argue that first- and second-person subjects and third-person subjects differ in their paradigmatic properties. First- and second-person subjects are obligatorily overtly marked, and depend on syntactic properties of the clause. This can be seen in the examples in (32), where the subject agreement markers are italicized.

(32) (a) (sı̨) jǫ náhdɛ́ 'I live here' (SS)
1sg. here 1sg.S.live
*(sı̨) jǫ nádɛ́

(b) (nı̨) jǫ nánɛdɛ́ 'you (sg.) live here'
2sg. here 2sg.S.live

(c) (naxı̨) jǫ náídɛ́ 'we live here'
1pl. here 1pl.S.live

(d) (naxı̨) jǫ náahdɛ́ 'you (pl.) live here'
2pl. here 2pl.S.live

The emphatic subject pronouns are optional, as indicated by the parentheses. In the presence of any given pronoun, only a single verb form is possible. It is impossible to impose an interpretation of, for instance, speaker as subject on a verb without first-person singular subject agreement, as is shown in (a).[19] This is a prototypical property of agreement: it represents a relationship between the inflectional item and a noun.

Deictic subjects have different paradigmatic properties: they are not obligatory in the same sense that the first- and second-person subject inflections are. For instance, the three sentences in (33) have approximately the same meaning.

(33) (a) dɛnɛ jǫ nádɛ́ 'people live here' (SS)
people here live

(b) dɛnɛ jǫ nátsʼɛdɛ́ 'people live here'
people here tsʼ.live

(c) dɛnɛ jǫ nágɛdɛ́ 'people live here'
people here g.live

The verb in (33a) contains neither of the number morphemes, but nevertheless can receive a third-person plural interpretation; the verb in (33b) is marked

with the unspecified subject prefix *ts'*, and that in (33c) with the third-person plural human subject prefix *g*. Cook (1996) and Saxon (1993) provide discussion of the semantic and discourse contexts of occurrence of these affixes in closely related languages. Rice and Saxon (1994) suggest that these morphemes, like the subject agreement morphemes, depend on syntactic properties of the clause and are obligatory; the understanding of their semantics and discourse properties is inadequate at this time. The morpheme *ts'* appears to include the speaker, while *k*/*g* indicates that a group, rather than individuals, are important. What is important here is that the third person, unlike the first and second person, does not require an obligatory overt marker.

Further examples illustrate in slightly different ways that *k*/*g* is not required for a third-person plural interpretation. In Slave, some verb stems are found which have inherent in their meaning that the theme of the verb is plural; the verb stem *de* in (34) is one example. When *k*/*g* is present, the subject is necessarily third-person plural and human; in the absence of *k*, a non-human interpretation is also allowed.

(34) rı́*k*ɛrɛ́nı̨de 'they landed (human)' (H)
k.pl.land
rírɛ́nı̨de 'they landed (human, non-human)' (H)
pl.land

The different paradigmatic status of the deictic subjects from the first- and second-person subjects can also be seen in examples from texts where alternations between these morphemes are found. For example, in (35), the first occurrence of the verb 'kill' has the unspecified subject *ts'*, while the second has the plural affix *k*-.

(35) ʔɛyi gots'ę ʔɛkúhnı́ɛ ɬɛ*ts'*ɛgǫ dzá ʔagǫt'ɛ gots'ę
that from then ts'.kill bad it is and
k'áts'ɛlɛht'inɛkɛ sı́i dɛnɛ *k*ɛghǫ
Chipewyan foc. person pl.kill
'In those days, they killed each other and it was bad. The Chipewyan killed people.' (B)

While first- and second-person inflection has strictly syntactic conditions determining its presence, this is not true of inflection for third person: an overt marking may be present, but just which one is determined by semantic and contextual factors.

A second difference between first- and second-person subjects on the one hand and third-person subjects on the other can be seen in conjoined clauses. With first-person subjects, the relationship between the pronominal inflection and its specifier NP is one of agreement; with third-person subjects, the relationship is not one of agreement, but rather of mutual elaboration of semantic properties.

Slave is a pro-drop language, as can be seen in the examples in (32). The use of a pronominal subject is optional, and these subjects, when present, are necessarily interpreted as emphatic or contrastive. These pronouns enter into coordinate constructions in an interesting way. In the examples in (36), the first sentence of each set has a noun phrase consisting of a noun and a pronoun as subject. The second example illustrates that the pronoun can be dropped in this context, just as it is when it is the sole subject. That the subject involves a conjoined phrase is made clear from the presence of the conjunction. The final example of each set illustrates that if the conjunction too is absent, ill-formedness results. If first- and second-person subjects represent agreement, this is not surprising: the verb has plural subject agreement, but the NP with which it agrees is overtly singular. Without the conjunction, the NP is not second person.

(36) (a) Simon hé nį hé juice náahdí 'you and Simon buy juice'
and 2sg.and 2pl.S.buy (B)
Simon hé juice náahdí
*Simon juice náahdí

(b) Ann sɛnį hǫ gok'ɛríʔe lɛ́t'ɛ hít'į 'Ann and I have the same
1sg. and jacket like 1pl.S.have jacket' (H)
Ann hǫ gok'ɛríʔe lɛ́t'ɛ hít'į
*Ann gok'ɛríʔe lɛ́t'ɛ hít'į

The deictic subjects pattern otherwise: in this case, there is no agreement between a subject NP and the verb. In the example in (37), the subject noun phrase necessarily has a real-world singular referent, yet has a verb which contains the plural subject marker k/g. The meaning that obtains is one in which the subject is a group defined by the named individual.

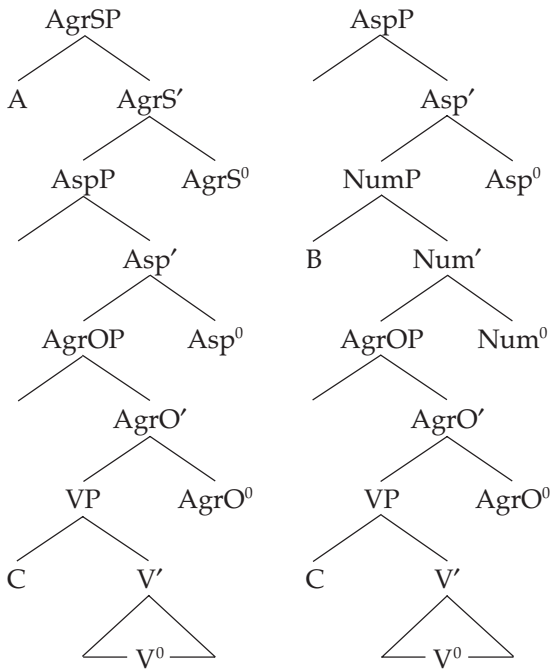
(37) sɛtá názéɬɛkɛdéhtɬa 'my father and he went hunting' (SS)
1sg.father k.dual go hunting

The specifier–head relationship is clearly quite different for agreement and number inflection.

I have argued, following Rice and Saxon 1994, that the two positions traditionally identified as subject inflection are both inflectional, but that two types of inflection are involved, agreement with first- and second-person subjects and number otherwise. I now return to the question first raised in section 2.2: the ordering of subject agreement and number. Ritter (1995), in a study of Hebrew, proposes that two subject categories are required in that language: agreement for first- and second-person subjects and number for the so-called third-person subjects. Ritter argues that these categories are layered with subject agreement above aspect and number below it. The hierarchical ordering of agreement and number relative to each other is thus identical in Hebrew and Slave.

The structures proposed for Slave in (38) summarize the discussion so far.

(38)



In first- and second-person contexts, subject agreement, AgrS, is found, while in 'third person' contexts, number, Num, occurs instead. If this is correct, then the mystery of two subject positions is revealed: the apparent splitting of subject inflection in the Athapaskan verb between two morphological positions is not so unusual, as these two positions house different morphological categories: they do not both represent agreement, as has often been assumed; rather, one is agreement, and the other number. It further appears that the ordering of agreement and number may reflect a universal property. If this is correct, then the ordering of the categories in the Slave verb is not an idiosyncrasy of the language that requires stipulation, but instead represents a cross-linguistic tendency to position number and agreement differently.

2.6 The status of objects

The inflectional nature of object pronouns has yet to be considered. While it is generally assumed that these pronouns are inflectional (e.g. in traditional treatments, Saxon 1986), Tuttle (1993) has argued that they are arguments. I have left these until last amongst the inflectional items, because the insight into subjects helps us to understand some of the properties of objects. I will propose that subjects and objects are parallel in nature: both are inflectional, and both show a split between first and second person on the one hand and third person on the other.

First- and second-person objects are identical in patterning to first- and second-person subjects: they are obligatory; in their absence, a reading of object as first or second person is not possible. These facts are shown by the examples in (39), forms with a first-person singular object. (39a) is a simple sentence with a first-person singular object, *s*. (39b) illustrates how if this morpheme is absent, a reading of object as first-person singular cannot be obtained. (39c) and (39d) differ from (39a) and (39b) in that an overt object, *sɛnį́*, 'first person singular' is present. The pronominal inflection is required, even in the presence of this overt pronoun.

(39) (a) rá*s*ɛrɛyį́ht'u — 's/he punched me' (H)
1sg.O.punched

(b) *rárɛyį́ht'u — (on reading 's/he punched me')

(c) sɛnį́ rá*s*ɛrɛyį́ht'u — 'it's me that s/he punched'
1sg. 1sg.O.punched

(d) *sɛnį́ rárɛyį́ht'u
1sg. punched

Third-person objects differ in their paradigmatic patterning from first- or second-person objects. These must be divided into two different types: anaphors and non-anaphors.

The anaphors fall into two categories: reflexive anaphors and disjoint anaphors (see Saxon 1984, 1986; Rice and Saxon 1991). The anaphors are all specific in reference. The reflexive *ʔɛdɛ* is used when the subject and object are co-referential (see K. Rice 1989 for details). The reflexive clearly does not mark person, as it is used to mark co-referentiality regardless of person of the subject.

A disjoint anaphor (the name is due to Saxon 1984), *zh*/*y*, is used only when the subject is third-person specific and when the object is a non-co-referential third-person-specific form. It occurs only when no object noun is present, as in (40). In the first form of each data set, an object pronoun is present; in the remaining forms a nominal object occurs, and there is no object pronoun. The anaphor is italicized.

(40) (a) Mary ná*zh*ɛnį́tá — 'Mary kicked him/her/it (sg./pl.)' (SS)
Mary John náni̱tá — 'Mary kicked John'
Mary tthe náni̱tá — 'Mary kicked the stone/s'
stone

(b) Mary gá*y*urɛhtę — 'Mary taught him/her' (H)
Mary ts'ǫ́dani gáhurɛhtę — 'Mary taught the child'
child

While the disjoint anaphor is not present when a nominal object appears in the sentences in (40), there is one condition under which a disjoint anaphor and

a nominal object may co-occur: when the nominal object is third-person plural human. The plural disjoint anaphoric form is *go*. Like the subject *k*/*g*, it may or may not be present in a sentence.

(41) ts'ǫ́danikɛ ká*go*denézhú 's/he chased the children out' (B)
child.pl. go.*chased out*
ts'ǫ́danikɛ kádenézhú 's/he chased the children out'

When it is present, it necessarily implies a human object; if it is absent, the object may be human or non-human.

(42) ła*go*nı̨hdé 'they killed them (human)' (B, SS)
łanı̨hdé 'they killed them (human/non-human)'

The object form *go* marks that the object is human, plural, specific and non-co-referential with the subject. The semantics of this morpheme closely parallels that of *k*/*g* except for the anaphoricity, a property that cannot be found in subjects. While *y*/*zh* is simply disjoint anaphoric and specific, *go*, in addition to being a specific disjoint anaphor, includes number and gender in its meaning. The disjoint anaphoric pronouns, then, do not mark person, since they are not obligatorily present in third-person contexts; they instead indicate number, gender and specificity.

Sentences with third-person direct objects and first- and second-person subjects remain to be considered. In this context, a third-person non-human object never has an overt marker (43a); a third-person human object may be marked by *b*/*m*, but need not be (43b). The semantic and discourse conditions under which *b*/*m* is found remain to be explored.

(43) (a) nániita 'I kicked him/her/it' (B)
náɓɛniita 'I kicked him/her'

(b) gáhurɛhtę 'I taught him/her' (H)
gáɓurɛhtę 'I taught him/her'

Third-person plural human specific objects may be marked by *ku*/*ki*/*gi*/*go* (form differs depending on dialect).

(44) (a) ts'ɛ*ku*nı̨wa 'you (sg.) wake them up' (H, B)

(b) t'erɛ ts'ɛ*ku*nı̨wa 'you (sg.) wake the girl up' (H, B)
girl

(c) t'erɛ ts'ɛnı̨wa 'you (sg.) wake the girl up' (H, B)

The form *b*/*m* marks animacy alone when it is an object. *ku*, and its other dialect forms, in addition to indicating gender, also marks plural number; both indicate specificity.

The semantics of the third-person direct objects is summarized in (45). The unspecified object *ʔɛ* is included for completeness.

(45)

	zh/y	go	b/m	ku	ʔɛ
anaphoric	anaphoric	anaphoric	non-anaphoric	non-anaphoric	non-anaphoric
number	± plural	plural	non-plural	plural	± plural
gender	± human	human	human	human	non-human
specificity	specific	specific	specific	specific	non-specific

These pronouns are similar to the third-person subjects. In both cases, the third persons have a different paradigmatic status than do the first and second persons: while the sense of first and second person can be conveyed only by the overt presence of a morpheme, the sense of third-person object does not require the appearance of a morpheme. The object morphemes thus fall into two different categories, agreement and number, just as the subject morphemes do.

Further facts indicate a split between first- and second-person objects and third-person objects, and provide additional evidence for just first and second persons indicating agreement. Just as co-ordination facts differ for subjects, depending upon whether a first or second person or a third person is involved as a conjunct, so they do for objects. This can be seen by comparing the examples in (46) and (47). In (47), with a first person involved in the co-ordination, the pronoun can be dropped (46b), but the conjunction is required (46c); in (47), with a third-person plural reading, the stated NP is overtly singular, and the conjunction is not needed. The object form *raxe* marks both a first-person plural and a second-person plural object.

(46) (a) Mary sɛnį hé ra*rax*ɛrɛyįht'u
1sg. and 3 hit 1pl./2pl.
's/he punched Mary and me/you' (H)

(b) Mary hé ra*rax*ɛrɛyįht'u
and 3 hit 1pl./2pl.
's/he punched Mary and me/you' (H)

(c) *Mary ra*rax*ɛrɛyįht'u
3 hit 1pl./2pl.
(okay as 'Mary punched you (pl.)/us')

(47) sɛtá rá*go*rɛyįht'u
1sg.father 1sg.hit 3pl.
'I punched my father and him/her/them' (H)

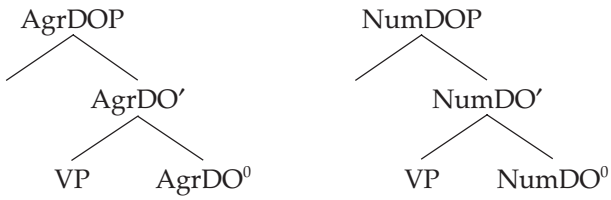
In (46), the conjunction is required to yield the interpretation in (46a, b), while in (47) no conjunction is necessary.

Objects, like subjects, then, are of two types. First and second persons include features of person and number, and exhibit syntactic properties of

agreement. The so-called third persons may be either anaphoric or non-anaphoric; in addition, they are marked for features of number, gender and specificity. The fact that they are not obligatory for third-person interpretation suggests that they are unmarked for person. The syntactic patterning in conjunction of first- or second-person object forms shows properties of agreement, just as with subjects; the patterning of the third-person forms is not one of agreement, but of elaboration.

First- or second-person subjects and third-person subjects clearly appear in two different positions in the verb, being separated by other inflectional material. The evidence discussed in this section suggests that the objects should have structure parallel to that of the subjects, which trees as in (48).

(48) first and second persons 'third' persons



The additional evidence from morpheme ordering that argues for two subject positions is not available for objects, since objects are traditionally thought to occupy only a single position in the verb template.

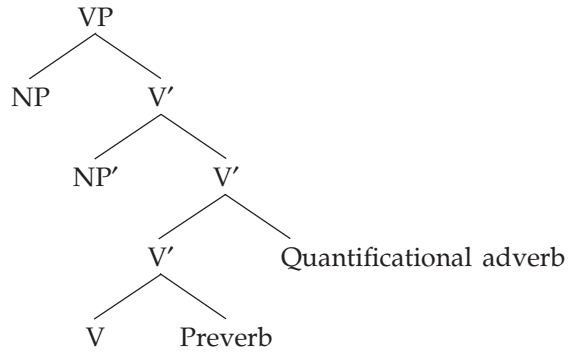
2.7 *An ordering problem: the need for a template for the disjunct morphemes*

So far I have discussed the conjunct complex. I have suggested (i) that the traditional divisions of morphemes into categories of inflection and derivation requires rethinking, with some of the traditional derivation being considered as inflection; (ii) that pronouns do not form a single inflectional category, but non-third-person pronominals represent agreement, while deictic third-person pronominals represent number; (iii) that the verb originates as head of the VP, and moves to provide a host to the inflectional complex. Given this view of the verb, several traditional problems receive an explanation.

In this section I turn to the need for a template within the remaining portion of the verb, the disjunct complex. I suggest that the need for a template is again overstated, and that basic principles of semantics provide a means of predicting the order in which disjunct morphemes appear. I begin by proposing an overall structure for the verb phrase.

The verb phrase has the structure in (49), expanded from (29).

(49)



Some of this structure was introduced in section 2.3. The primary purpose of this section is to discuss the overall ordering of the remaining material.

Before turning to this, however, it is necessary to address briefly two other issues. First, the inflectional/lexical status of VP-internal elements has not been established. The lexical status of all VP-internal material is obvious with the exception of the quantificational adverbs. These elements are aspectual in nature, and one might think that they should be regarded as inflectional. But they fail the test of obligatoriness, as is shown for the iterative in (50) and the distributive in (51).

(50)	nidı́dhah	's/he picked up plural objects' (SS)
	ni*na*dı́dhɛh, nidı́dhɛh	's/he picked up plural objects repeatedly'
(51)	nánɛyihkwa	'I whipped it' (y conjugation) (B)
	náy*á*nɛhkwa, nánɛhkwa	'I whipped each one' (w conjugation)

On the first line of each data set, a form without a quantificational adverb is shown. On the second line, two forms are given, one with the adverb (*na* iterative, *yá* distributive), the other without it, but with the same meaning. In both cases, there are further differences between the forms on the two lines. With the iterative, a different stem form is required, and this is the major signal of iterativity. In the distributive form, the change in conjugation and aspect is the primary signal of distributivity; the distributive morpheme serves only to reinforce this. The morphemes themselves, then, are not paradigmatic.

Second, in (49) the adverbs and preverbs are daughters of V' rather than of V. This syntactic status is clearest for the quantificational adverbs. The iterative quantifies the action with many verbs; for instance, with the stem 'go' it means 'go again'. However, it can also quantify an object. In a predicate such as 'I ate an apple', if the iterative is present, it refers to the apple, specifying that the speaker ate another apple. Thus, depending on the semantics of the predicate, the iterative can refer to material outside the verb word itself. This is different from the semantics of a prefix such as *re-* in English, which refers just to the verb. Arguments are more difficult to establish for the preverbs, but

do exist. Many of the preverbs need not be part of the verb word, but can be independent of it, being included within the verb word when they are strictly subcategorized for. This might suggest that they are phrasal- rather than word-level elements. In addition, preverbs can be transitive. A phrasal structure better allows for this property, perhaps, than a lexical structure would.

Having established these preliminaries, I turn to the ordering of elements within the disjunct portion of the verb. The common analysis of the disjunct complex, like the rest of the verb, proposes that a template orders the morphemes. While templates, or position classes, have been proposed both traditionally (e.g. Lounsbury 1953 on Oneida; Sapir and Hoijer 1967 on Navajo) and recently (e.g. Bessler et al. 1993 and Bonet 1991 on Romance; Kari 1989 on Ahtna and Navajo; Kari 1992 on Ahtna; Kari 1993 on Tanaina; Simpson and Withgott 1986 on Central Australian languages), they have also been the target of criticism (e.g. McDonough 1990 and Speas 1990, 1991b on Navajo; Myers 1987 on Shona; K. Rice 1991b, 1993, on Slave). In this section I suggest that evidence for position classes in the disjunct complex of the Slave verb is weak. Rather, the basic ordering follows from the semantic principle of scope discussed in section 2.3, where morphemes of greater scope appear higher in the tree than morphemes within their scope. While the template is a useful descriptive device, it has little reality beyond this.

Recall that in the Slave verb template, the morphemes of the disjunct complex occur in a fixed order, summarized again in (52).

(52) preverb – quantificational adverb – incorporate

If the morphemes are ordered by a template, one might expect to find random variation in the ordering of the position classes across the languages of a family; one would additionally expect there to be no general principle that orders the morphemes. These predictions are not borne out when the languages of the Athapaskan family are examined. I will concentrate on the evidence that can be garnered from Slave alone (see Rice K. 1991b, forthcoming, for discussion of comparative evidence).

One prediction of a template is that position classes should be rigidly ordered within a language, with no variation allowed, except by phonologically motivated metathesis. Unexpectedly for this hypothesis, some variability in the ordering of position classes is found in several Athapaskan languages (see ibid.). This variability is seen in Slave when the position of the iterative with respect to incorporates is examined. While generally incorporates appear at the right edge of the disjunct complex, this is not invariably the case: there are some verbs in which the position of the iterative is variable, being allowed to the right or the left of the incorporate. Some examples are given in (53). *na* is the iterative; it precedes or follows the incorporate (*dze* 'heart' in (53a) and *ɬa* rope' in (53b)). Forms are from Howard 1990.

(53) (a) dahdze*na*ɬɛ́ts'ɛdɛtthɛ 'start in fright, be startled repeatedly' (SS)
dah*na*dzeɬɛ́ts'ɛdɛtthɛ

(b) nałana?ɛts'ɛdɛtłɛ 'drag, lead (rope, animal on leash)
nanała?ɛts'ɛdɛtłɛ repeatedly' (SS)

The existence of a template presupposes a rigidity of ordering that should not be violable; the examples in (53) show that this absolute ordering is not actually found.

Perhaps a more important reason for rejecting a template is the fact that the ordering both within and between constituents within the disjunct complex appears to correlate with semantic properties of the morphemes involved. In the remainder of this section, I suggest that the major ordering properties of disjunct morphemes need not be stipulated, but are a consequence of semantic properties. I suggest the following principle, a principle alluded to in the discussion of the ordering of inflectional elements in section 2.3.

(54) When one morpheme is in the scope of another, the morpheme of greater scope must be higher in the tree than the morpheme within its scope.

By this, I mean that, given two morphemes that can be construed as being related in some way, the more general one will appear higher in the tree than the more specific one.

While I am making this proposal with respect to ordering in Slave, it is perhaps a particular instantiation of a general principle, that D-structure hierarchical relations are a reflection of scope (cf. Baker 1988a, Brunson 1989, Jackendoff 1972, McCawley 1988, Speas 1984, for discussion of the relationship between scope and word order).

Having set out the basic proposal, I turn to the facts of Slave, beginning with a discussion of the treatment of the preverb-verb as a unit, and then examining higher-level ordering. The preverb–stem unit is often considered to be a lexical entry or a result of an early level of word formation (see e.g. Kari 1979, 1990, 1992; Randoja 1989; Sapir and Hoijer 1967; Speas 1984; and discussion in section 2.1). This is because the preverbs modify the meaning of the stem, providing either a systematic or an idiosyncratic change in meaning to the stem. Consider, for example, the preverb in (55).

(55) kádı̨tła 'you (sg.) go out'
ká 'out' (preverb)
tła 'sg., dual go on land' (stem)

In this example, the preverb restricts the meaning of the verb stem, expressing something about the direction of movement.

Another indication that the preverb-verb forms an integral unit is that modification of the preverb alone is not possible, but the preverbs modify the meaning of the verb stem alone. A parallel argument has been used in English to argue for verb-particles as units in a phrase like 'strike out the batter', where the particle 'out' can be viewed as incorporated into the verb,

as it cannot be modified. When the particle appears after the object, it can be modified, as in 'strike the batter right out'. The difference between Slave and English is that morphemes in preverb position are always incorporated in Slave, while in English incorporation is optional. The fact that the preverb is the closest item to the stem is consistent with its patterning.

Assuming that the preverb and verb form a unit, the ordering of preverbs and quantificational adverbs is predictable: quantificational adverbs are higher than preverbs.

The adverbs modify the preverb–verb complex, not just the stem, as argued for explicitly in Kari 1979, 1990, 1992, and Randoja 1989, and widely assumed in the literature. For instance, consider the Slave iterative form in (56).

(56) kǫdįtɬa 'you (sg.) go back out'

In this example, the iterative morpheme, which surfaces here as nasalization and raising of the vowel of the preverb *ká*, indicates that the entire action of going out is repeated, suggesting that the iterative has scope over the action as a whole, not just over the verb stem. The example in (57) illustrates this with the distributive adverb.

(57) tehɛ̨tɬa 's/he went into water'
teyáhtɬa 's/he went into water over and over'

The entire action of going into water is repeated, not just the going.

The adverbs thus have scope over the preverb-verb, in that they modify the meaning of the complex, not just the meaning of the stem. Given scopal ordering, one expects the adverbs to appear higher than the preverbs.

Combinations of preverbs within a single verb word are possible in Slave, as shown in (58). Numbers following a gloss refer to page numbers in Howard 1990; other data are from K. Rice 1989.

(58)	(a)	tɛkáyįya	's/he got out of water' (tɛh 'water' + ká 'out of') (H)
		-t'áhkáts'ɛdíle	'unharness, take out of harness (e.g. dog team)' (315) (t'áh 'into' + ká 'out of')
		tɛhk'ɛts'ɛnɛtah	'look around in water, feel around in water with stick' (393) (tɛh 'water' + k'ɛ 'on')
	(b)	O k'ɛníndhah	's/he put pl. O back together' (k'e 'on' + ní 'terminative')
		ɬɛ́níts'į?a	'fold' (9) (ɬɛ́ 'in half' + ní 'terminative')
		-k'ɛnídagodɛ́nį?ǫ	's/he accused, blamed' (34) (k'ɛ 'on' + ní 'terminative')

	-dáhká?ɛts'ɛdɛchu	'open (e.g. container)' (67) (dáh 'close' + ká 'open')
	sɛ́ɛ́níɛnits'ı̨hthi	'think over, get straightened out in mind' (148) (sɛ́ɛ́ 'good, right' + ní 'terminative')
	xǫníagots'ı́hthi	'get married, establish home' (182) (xǫ 'spouse' + ní 'terminative')
	łaáníts'ı̨tsɛ́h	'kill with spear' (567) (łáá 'dead' + ní 'terminative')
(c)	kátáhtłah	's/he got out on shore' (ká 'out of' + tá 'to shore') (SS)
	łǫdahɛtłɛ	's/he is dancing in circle' (łǫ 'circle' + dah 'up and down')
	nałǫts'ɛ́d?éh	'turn in circles on water' (42) (na 'continuative' + łǫ 'circle')

Within the preverbs too, the ordering of morphemes appears to be predictable. The forms in (58a) show that preverbs specifying location precede those specifying direction, source and position. For example, *tɛ́h* 'water' is a location and *ká* 'out (of)' specifies a direction; *tɛ́h* specifies the location and *k'ɛ* the location. The relational items share properties with postpositions, following their object.

The forms in (58b) suggest that a more specific preverb precedes a more general preverb. For instance, in 'kill with spear', the second preverb indicates termination of an activity, and the first indicates the manner of termination: namely, death. The same pattern is found in 'think over'; here the second preverb again indicates termination, while the first specifies the type of ending: namely, in something being good or straightened. The example 'accuse, blame' is similar: the verb without *k'ɛ* indicates coming to an end of a verbal action; the preverb *k'ɛ* then indicates the goal of this activity. In these cases, then, the first preverb delimits the domain defined by the second.

Some verbs show somewhat different patterning. In some cases, it is difficult to identify whether one of the preverbs is more general than the other. Examples in (58c) include 'out to shore' and 'circle up and down'. More work on the semantics of such constructions is required. If the preverbs are equivalent in scope or generality, bearing no particular relationship to one another, their ordering properties must be determined by other factors (e.g. is the reverse ordering possible; if so, are the interpretations identical?).

The order of preverbs does not appear to be random, but is a consequence of general semantic properties, where a more specific preverb precedes a more general preverb.

The placement of quantificational adverbs shows the greatest variability across the family. This is perhaps not surprising, given the considerable variation in the placement of adverbs cross-linguistically. For instance, Jackendoff (1972) notes that an English adverb such as 'frequently' may occur in a range

of positions without having discernible effect on the meaning of a sentence. He suggests a possible account of the variable placement of sentential adverbs: such adverbs are transportable, or can be placed in various positions in the sentence. Jackendoff shows that VP adverbs do not show the same privileges of occurrence as sentential adverbs.

This analysis of transportability may provide insight into the position of the iterative. As shown in (44), the iterative exhibits some freedom in its position. In fact, it may even occur more than once in a particular verb, as (59) illustrates.

(59) góhdǫkǫʔɛtsʼɛdetsɛ 'break into, through, repeatedly' (574) (SS)

In this case, the nasalization on *dá* and *ká* are the surface realization of the iterative. The adverb 'sprinkles' itself over the preverbs.

While the iterative is variable in position, it occurs to the right of the preverbs. Perhaps it can be considered to be a transportable adverb, and thus can be found in more than one position within the VP. It is subject to the constraints of scopal ordering, however, meaning that it must be to the right of the preverbs.

Within the adverbs themselves, I have suggested that the ordering is distributive-iterative. I make this suggestion based on forms such as (60), where *yá* distributive precedes *nǫ* iterative.

(60)	ɬɛ́yánǫhtsɛ	'I break each customarily' (B)
	O yánaníhshe	's/he grows plural object again' (B)
	sɛyiyánǫwɛta	's/he kicked me customarily' (H)
	níyánǫgokɛhwhɛ	'they each returned' (B)

In fact, the ordering of the distributive and iterative is not straightforward in Slave. While *na* iterative clearly follows *yá* distributive in the examples in (60), a closer examination indicates that not only the iterative *na* follows the distributive. More generally, any low-toned disjunct morpheme *na* must follow the distributive. This is shown in (61).

(61)	nahkʼá	'I sharpen it' (B, SS)
	yánǫhɛ́hkʼá	'I sharpen each' (B)

Assuming that *na* here is a preverb, not the iterative, any disjunct morpheme of the form *na* follows the distributive, making it difficult to determine if there is a semantically based ordering relationship between the distributive and the iterative. They are clearly adjacent, but their overall ordering is possibly determined by phonological, rather than meaning, factors.

In Slave, incorporated stems occur within the verb, generally at the right edge of the disjunct complex. Saxon and Rice (1993) argue that such stems originate in VP-internal positions (B, C in (38)) and fail to move to A, external subject position. They are then incorporated by head movement.

2.8 Summary

The full structure that I have proposed for the Slave verb ((28)/(29)) is strikingly like that of the template that is generally given, but differs in two ways: first by the placement of the verb stem, and second by the position of the incorporated stems. I have argued that the template provides a convenient descriptive tool; the ordering of the elements is actually largely a consequence of scopal properties and thus follows from principles of universal grammar combined with language particular statements concerning directionality.

2.9 A locality problem: discontinuous constituents

Athapaskan languages illustrate another problem: they are rife with discontinuous constituents. As discussed in section 2.1, the basic lexical entry of a verb obligatorily includes a voice element and a stem. I assume that the voice element combines with the stem lexically, with voice and transitivity alternations determined in the lexicon (see section 2.1). The minimal lexical entry of a verb is thus as in (62).

(62) voice – root $]_v$

More complex lexical entries exist, as illustrated in section 2.1, with other morphemes occurring within a verb theme. In such cases, the meaning is defined on the entry as a whole, not on individual morphemes. For instance, in the theme *n-h-ji* 'scare', it is not possible to assign meanings to the individual elements of the theme. In such structures, the assumption made in the Athapaskan literature has been that these are single words (see e.g. Kari, Randoja, Rice, Speas, Wright and many others). However, an alternative solution is available. Di Sciullo and Williams (1987), in a study of English phrasal idioms, suggest that these idioms are syntactic objects that are listed in the lexicon. The idioms are like words, in that their meanings are non-compositional, but differ from words in being phrasal. I propose that the discontinuous verb themes in Slave entries should be considered as comparable to English phrasal idioms. (63) gives an example.

(63) $[[h]_{voice}\ [ti]]_v\ [zha]_N$ 'preach, bark'

Each morpheme is labelled for category. When this unit is inserted into the larger syntactic structure, the morphemes are correctly placed. No further stipulation of position is required, as it is a consequence of phrasal structure, which itself follows from scopal properties.

Lexical entries can also include gender material and direct objects. For instance, the verb 'scare' has a gender morpheme, and 'tell a lie' a direct

object that must occur with the stem. I have labelled the direct object as a pronoun. The fact that the verb is transitive determines that the pronoun is an object rather than a subject.

(64) $[h]_{voice}$ $[ji]_{v}$ $[n]_{gender}$ 'scare'
$[ts'i]_{v}$ $[go]_{Pro}$ '(tell a) lie'

By treating discontinuous verb themes as idioms, the benefits achieved by the analysis proposed here can be maintained. Slave may be unusual in the number of phrasal idioms it has, but the construct is not in and of itself unexpected. Adverbial material and gender-type classes are often lexicalized. The apparent discontinuous dependencies are, I suggest, historically motivated, but synchronically frozen, with the forms listed as phrasal idioms.

2.10 An isomorphism problem: deriving the phonological structure

So far I have addressed issues of morphosyntactic structure, rather than phonological structure. The interface between these two components is an important one to consider for Athapaskan languages. In most accounts of languages of this family, it is assumed that a boundary is associated with each lexical entry, with the morphosyntactic structure and the phonological structure being autonomous. Kari (1990), for instance, proposes that a boundary is associated with each lexical entry. The entire string of lexical items is formed through processes of derivation and inflection, with morphemes being interdigitated amongst each other. At the end of the morphological derivation, a form that serves as underlying representation is produced. I suggest an alternative: that boundaries are not listed lexically, but rather that the phonological structure can be derived directly from the morphosyntactically given structure (see K. Rice 1993 for a slightly different analysis).

The phonology of Slave divides the verb word into several distinct units, as indicated by the boundaries in (22). Limitations of space prevent me from presenting arguments for the boundaries; see Hargus 1988 on Sekani; Kari 1976 on Navajo; Kari 1975 on Navajo and Tanaina; Kari 1990 on Ahtna; F-K. Li 1946 on Chipewyan; McDonough 1990 on Navajo; Randoja 1989 on Beaver; K. Rice 1989, 1992b, 1993, on Slave; and many others for justification of these domains within the verb word in a number of Athapaskan languages.

The following phonological domains are required.

(65) (a) The traditional verb word is a domain for the purposes of the phonology.
(b) Each lexical item, or morpheme traditionally identified as disjunct, forms a domain.
(c) The traditional conjunct items form a domain.

(d) The direct object and deictics are intermediate in patterning, sometimes patterning with conjunct morphemes, sometimes with disjunct morphemes, and sometimes on their own.

I will characterize these domains in an informal way. Recall the structure of the verb that results from verb raising, repeated in (66).

(66) [[[Pre] [Adv] [Inc]]$_{VP}$ [[AgrDO Num Asp2 Asp1 AgrS] [V]]]

The output of the syntax defines certain domains directly. First, the largest domain, the traditional verb word, is the maximal functional projection, in this case AgrSP. Within this, the VP-internal material forms a domain, as does the remainder of the material. Second, each major category lexical item (noun, verb, preverb, adverb) forms a unit on its own; in addition, the inflectional component is a unit. These phonological units thus parallel directly the syntactic structure. Within the inflectional word, AgrDO and Num are intermediate in their phonological patterning: these, I suggest, form words in this component, and are uniquely recognizable as the pronominal forms. The phonological domains are summarized in (67).

(67) $X^{max.}$ (X is a functional head)
phrasal units within $X^{max.}$
word-level units
pronominals

Consider, for instance, a verb with a preverb, AgrDO, Asp2, Asp1, AgrS and V. This unit has the derived syntactic structure in (68).

(68) [[Pre]$_{VP}$ [[[AgrDO] [Asp2] [Asp1] [AgrS]] [V]]]

The only discrepancy between the structure defined by the syntax and the domains required for the phonology comes within the inflectional component, where Asp2, Asp1 and AgrS form a single span.

While this discussion of the phonology is brief, the approach to the phonological domains is one that promises to be revealing, leading, if successful, to the elimination of boundary type as part of the underlying entry of a Slave word. It appears that while the lexically stipulated boundary types are a useful descriptive device, they have no linguistic reality.

3 Summary

In this sketch I have touched briefly on a range of problems introduced by the noun and the verb in Slave. I have suggested that in both cases, analyses that

are more in keeping with those of other languages may be more appropriate than has often been believed to be the case. In the noun, the apparent ordering paradox of inflection inside derivation disappears when prosodic information as well as morphosyntactic information is allowed as part of a lexical entry. In the verb, the major ordering of constituents can be determined through an appeal to a principle that derives ordering through scopal relations between morphemes. I have also suggested that the apparently anomalous two subject positions in the Slave verb are not arbitrary, but are a consequence of the fact that they represent two different inflectional categories. Finally, I have suggested that the frequently proposed lack of isomorphism between the model required for word formation and that required for the phonology is an artefact of the analysis rather than a true fact of the language; the phonological domains derive in a straightforward way from the morphosyntactic structure, referring only to information that is independently required for the morphology and the syntax.

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NOTES

1 Languages of the Athapaskan family are found in three discontinuous groups: Apachean, spoken in the South-west of the United States; Pacific Coast Apachean, consisting of a number of languages (many now extinct) spoken on the Pacific coast of the United States; and northern Athapaskan, consisting of a number of languages spoken in Canada and Alaska. The spelling 'Athapaskan' is the official spelling of the language family adopted by the Canadian government, while the spelling 'Athabaskan' is suggested by the Alaska Native Language Centre. The word Slave is pronounced [slévi]. This language is composed of a dialect complex, with the major dialects being Alberta Slavey, South Slavey, Bearlake, Hare and Mountain. Data in this paper are drawn from South Slavey (SS), Bearlake (B) and Hare (H) ([hær]), and are, where appropriate, labelled as to dialect when the particular phonological form represents a single dialect. The major dialect differences are phonological; the facts discussed here are the same across the dialects. See K. Rice 1989 for discussion of dialect differences. An updated and more in-depth study of the issues raised in this chapter is to be found in Rice, forthcoming.

2 I use the standard orthography for Slave with one exception. I use <e> to represent [e] and <ɛ> to represent [ɛ]; the orthography employs <ə> and <e> respectively. The following correspondences should be noted: sh = [ʃ], zh = [ʒ], gh = [ɣ], th = [θ], dh = [ð], wh = [w̥]. An acute accent marks high tone; absence of an accent indicates low tone. A hook under a vowel represents nasalization. The symbols d, dz, dl, g, etc. represent voiceless unaspirated stops and t, ts, tɬ, k, etc. represent voiceless aspirated stops, following Athapaskan tradition. C' is an ejective consonant. The laterals pattern with the fricatives in Slave. The symbol ɬ is thus a voiceless lateral fricative, and l a voiced lateral fricative.

3 A small number of bisyllabic monomorphemic nouns exists; see section 1.3.

4 See Cook 1984 on Sarcee; Cook 1989 on Chilcotin; Hargus 1988 on Sekani; Kari 1976 on Navajo; Kari 1990 on Ahtna; Krauss 1965, 1969 on proto-Athapaskan; Leer 1979 on proto-Athapaskan; K. Rice 1988, 1991c, 1992a on Slave for various perspectives on voicing alternations.

5 There are some stems with non-alternating voiced fricatives: for example, zhah 'snow', la 'work', zo 'marten' (H), zǫ 'only'.

6 In Slave verbs, stem-initial fricatives *are* voiceless following a voiceless segment and voiced following a voiced segment, hence showing phonological transparency.

7 Some comments are in order. First, I ignore the possessive agreement suffix illustrated in many of the forms in (7)–(10). There is some evidence, largely phonological, that it is outside possessive structure. Whether it is a head or not requires further investigation. Second, as the structures in question are compounds, I assume that they are lexically formed. This suggests that the structure which houses the [voice] autosegment, labelled I in (14a), is available lexically. This is turn suggests that this inflectional item can have lexical as well as syntactic properties. The consequence of this is that the strict identification of inflection as syntactic must be weakened, although the configurational properties that identify an item as inflectional are present.

8 In some Athapaskan languages (e.g. Carrier, Koyukon), noun-stem-initial fricatives are voiced in possessed compounds as well as in the other environments in which the voiced alternant occurs in Slave.

9 In some forms, a diminutive or augmentative has become lexicalized and forms part of the minimal word with the stem. This can be seen in two ways. First, the inflectional suffix is on the right edge rather than internal, and second, the voiceless form of a noun-stem-initial fricative occurs. These effects can be seen in the following forms: tɬı̨ 'dog', -l̨ı́ 'dog, possessed form'. The uninflected stem historically began with a voiceless lateral fricative. While restructuring to a lateral affricate has occurred, the possessive form reflects the old alternation. In possessed compound forms, the initial of this stem fails to voice: thus -tɬı̨tɬ'ulé 'dog harness, possessed form'. An augmentative form of this word exists which has not the expected meaning of 'large dog', but rather an idiosyncratic meaning: 'horse'. In this form, the inflectional suffix is exterior to the augmentative, and the affricate,

rather than the voiced fricative, appears: for example, tłįcho 'horse', -tłįchoɛ́ 'horse, possessed form'.

10 These terms are used idiosyncratically in the Athapaskan literature, and should not be equated with the usual definitions. 'Mode' refers to morphemes which mark aspectual categories of imperfective and perfective, the modal category of optative, and the tense category of future. 'Aspect' also refers to what is traditionally thought of as aspect: morphemes marking concepts such as inceptive, terminative, semelfactive and conative.

11 The template in (22) is somewhat different from that proposed by Kari 1976, 1990. Kari places a single disjunct boundary between the incorporate and the direct object as part of the template, and uses + boundary between the disjunct morphemes themselves.

12 It is claimed that themes can include disjunct as well as conjunct morphemes (e.g. K. Rice 1989 on Slave). However, a search of the South Slavey verb lexicon (Howard 1990) fails to reveal any real cases of this. A commonly cited example is the form *ya-ti* 'preach, bark'. However, *ya*, an incorporate meaning 'word', does not appear in all bases involving this root, suggesting that the theme does not include this morpheme.

13 There is dispute about where conjugation and primary aspect are added.

14 See n. 7, however, where it is pointed out that not all inflectional items can be considered to be syntactic. The possessive agreement marker discussed in section 2 has configurational properties, but in compounds these are lexical rather than syntactic.

15 As discussed in section 2.1, phonological properties also enter into the ordering of gender and secondary aspect. Interestingly, there may be less of a difference between the two hypotheses for ordering of conjunct elements than initially appears. Under both hypotheses, the ordering qualifier (gender/secondary aspect) – conjugation (primary aspect) – subject is found. This overall order, I have argued, is established by semantics. The difference between the hypotheses comes in the subordering within the qualifier zone, where Kari argues that the ordering is strictly by template, while I have suggested that the ordering is a combination of semantics factors with a template. It thus seems that a hypothesis that combines features of the two hypotheses, with semantics providing first-degree ordering and a template providing second-degree ordering, would be in order.

16 This ordering is similar to that found by Bybee (1985) in her survey of morpheme ordering in fifty languages; however, Bybee's survey is based on surface morpheme order and Speas's on a more abstract underlying order, so they are not directly comparable.

17 McDonough (1990) proposes for Navajo that the conjunct component is formed in the lexicon and forms an inflectional stem. Specifically, she argues that subject and primary aspect form a portmanteau; the positions that I have labelled 'secondary aspect' and 'gender' (and also deictic subject and direct object) are prefixed to this unit. The inflectional stem and verb stem compound in the lexicon, forming a verb word. Her hypothesis is overly restrictive in forcing regular as well

as irregular morphology to be considered as single morphs, and faces several phonological problems in that predicted phonological characteristics are not always found and non-predicted ones are.

18 Thank you to Lisa Travis for this suggestion.

19 The so-called direct discourse verbs (K. Rice 1989, Saxon 1986) allow for an interpretation where a first-person singular subject marks that the subject of a lower clause is co-referential with the subject of the higher clause.