Nuu-chah-nulth Denominal Verbs

by

Ryan James Waldie
B.A., University of Victoria, 2001

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

MASTER OF ARTS

in the Department of Linguistics

Supervisor: Dr. Thomas E. Hukari

Abstract

Nuu-chah-nulth denominal verbs (DNVs) are created by attaching one of many DNV suffixes to the first word of a noun phrase.

In the framework of Head-driven Phrase Structure Grammar (HPSG), constraints on phrases can apply to items in the lexicon. Word-order domains allow constraints on linear order, such as one that requires words with DNV suffixes to be first in their domain.

Evidence suggests that the incorporated nominal is not counted towards the transitivity of the DNV. On the other hand, DNVs formed on several grammatical stems treat the corresponding unincorporated nominal as a full argument.

The properties of DNV suffixes in three other languages are compared with those in Nuu-chah-nulth and one general and three DNV-specific properties can account for all the behaviour noted.

Other analyses of DNVs in Eskimo-Aleut languages and in Nuu-chah-nulth are shown to be inadequate for the full range of properties associated with Nuu-chah-nulth DNVs.

Table of Contents

List of Abbreviations

BEN	benefactive
CAUS	causative
DEF	definite
DIM	diminutive
DUR	durative aspect
IMP	imperative mood
INAL.POSS	inalienable possessive
IND	indicative mood
INDEF	indefinite mood
INT	interrogative mood
MOM	momentaneous aspect
PASS	passive
PAST	past tense
PL	plural
POSS	possessive
REFL	reflexive stem
REL	relative mood
REL.DEF	definite relative stem
REL.INDEF	indefinite relative stem
SG	singular
TRANS	transitive stem

Acknowledgements

First, I would like to thank Katie Fraser, my primary consultant, for teaching me about her language. I always looked forward to our sessions together, and without her I could not have written this thesis.

My committee members have been wonderful and very accommodating, and deserve many thanks. Tom Hukari's input has been invaluable. As my supervisor, he has kept me on track and pointed me in the right directions throughout my research. Leslie Saxon and Su Urbanczyk, my departmental members, have been enthusiastic and have given me excellent feedback and suggestions, as has my external examiner, John Tucker.

I would also like to thank my fellow Wakashanists, past and present, whose work has been inspirational. I am particularly grateful for the discussion and help I received from Barry Carlson, Henry Kammler, Rachel Wojdak and Florence Woo.

Everyone in the Department of Linguistics has, in some way or another, helped, encouraged and influenced me over the past several years. Thank you all.

I am grateful for the financial support from various sources. The University of Victoria provided me with a Master's Fellowship and the BC Advanced Systems Institute awarded me an ASI Graduate Scholarship. My fieldwork was funded under a grant from Social Sciences and Humanities Research Council of Canada given to Tom Hukari and Donna Gerdts. The Department of Linguistics provided me with a Teaching Assistantship and the Lacandón Cultural Heritage Project employed me as a Research Assistant.

Finally, I would like to thank my family and friends, who have had to compete with the demands of graduate student life. And a lifetime of thanks to Linda, who has had to deal with me in "finals mode" and then in "thesis mode" for so long, and has always encouraged me to keep going.

Chapter 1
Introduction

In this thesis I examine the denominal verb (DNV) suffixes in Nuu-chah-nulth.[1] These suffixes can attach to nouns, the result looking much like noun incorporation, where a noun stem and a verb stem are compounded resulting in a verb. In (1), the suffix *-'i·c* "ingest" has changed the noun *ċisqmis* "meat" into *ċisqmisʔic* "eat meat".

(1) ċisqmisʔicʔiš ʕiniiƛʔi
ċisqmis-'i·c-ʔi·š ʕini:ƛ-ʔi·
meat-ingest-3.IND dog-DEF
"The dog is eating meat." (FW 66)[2]

What is truly remarkable about these suffixes is that they can also attach to the *modifier* of their object. So in (2) it is the modifier *ʕič* "rotten" that acts as the stem for the DNV suffix, not the noun *ċisqmis* "meat".

(2) ʕič'iicʔiš ċisqmis ʕiniiƛʔi
ʕič-'i·c-ʔi·š ċisqmis ʕini:ƛ-ʔi·
rotten-ingest-3.IND meat dog-DEF
"The dog is eating rotten meat." (FW 24)

The Nuu-chah-nulth data in this thesis are in the Ahousaht dialect, and were elicited from Katie Fraser. In addition to providing grammatical sentences which I elicited by asking for the Ahousaht translation of an English sentence, she also provided grammaticality judgements on Ahousaht sentences that I presented to her. Thus, some of the examples in this thesis are ungrammatical and marked as such with an asterix (*).

I present an analysis in Head-driven Phrase Structure Grammar (HPSG) (Pollard and Sag 1994, see) in which I do not treat DNV suffixes as signs. Instead, I treat them as morphological processes which are applied to a morphological stem. The differences between DNVs formed from nominals and those formed from certain grammatical stems (see §2.6) suits such an analysis.

In the remainder of this chapter I discuss the genetic relationships of Nuu-chah-nulth and the Ahousaht dialect (1.1) and review the previous scholarship on Wakashan

[1] Nuu-chah-nulth was formerly known as Nootka.

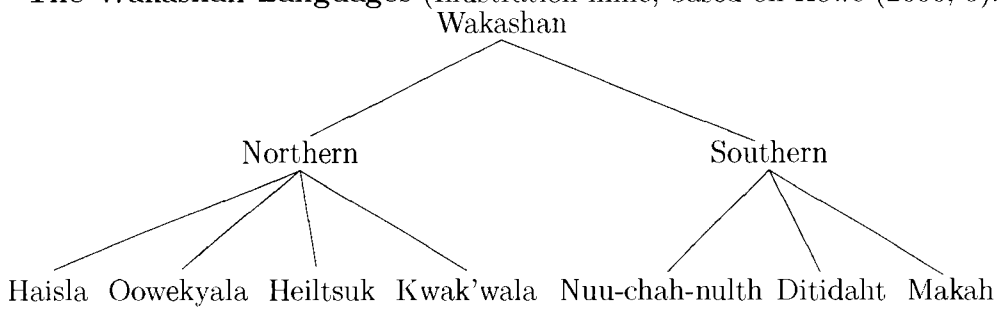
[2] The majority of the examples in this thesis come from my own fieldwork (2003–4), and are cited as FW followed by the line number in my notebook.

languages (1.2). After giving a short description of Nuu-chah-nulth grammar (§1.3), I present more facts about Nuu-chah-nulth DNV suffixes in (§1.4). As my analysis is couched in the theoretical framework of HPSG, I give a brief introduction to the basic principles of HPSG, along with my theoretical assumptions regarding morphology in §1.5. Finally, in §1.6 I outline the remainder of this thesis.

1.1 The Nuu-chah-nulth Language

Nuu-chah-nulth is a language spoken on the west coast of Vancouver Island. According to the 1996 Canadian census, there are 590 speakers (Norris 1998). Along with Ditidaht and Makah, it is a member of the southern branch of the Wakashan language stock. The northern branch consists of Kwak'wala, Heiltsuk, Oowekyala[3] and Haisla.

(3) **The Wakashan Languages** (Illustration mine, based on Howe (2000, 6).)



1.1.1 Ahousaht

More than twelve[4] dialects make up Nuu-chah-nulth, stretching from Cape Cook at the north to Barkley Sound in the south. The Ahousaht (*ʕaaḥuusʔatḥ*) dialect, spoken on Flores Island, is the focus of this study.

1.2 Previous Scholarship on Wakashan Languages

Scholars have been studying Wakashan languages for over a hundred years, producing a body of literature which is still growing. In the sections below I discuss

[3]Some researchers (e.g., Jacobsen (1979b)) consider Heiltsuk and Oowekyala dialects of the same language. I follow Howe (2000) in my classification.

[4]Researchers have given many different estimates on how many dialects there are. Howe (2000) lists twelve, but Rose (1981) lists sixteen, and Nuuchahnulth Tribal Council (1991), eleven. A proper dialect study is needed to clarify the situation.

the contributions made by these people since the late 19th Century. As the focus of this thesis is the Nuu-chah-nulth language, I give the most consideration to the work published on it, but first, I review the literature on the rest of the Wakashan languages. I discuss the comparative work on Wakashan in §1.2.1, then I give a summary of the published material on the northern languages (§1.2.2) and Ditidaht and Makah (§1.2.3) before looking at the work on Nuu-chah-nulth in §1.2.4. Finally, in §1.2.5 I discuss what other scholars have said about the DNV suffixes in Nuu-chah-nulth.

1.2.1 Comparative Studies in Wakashan

Boas (1890a,b) first notes the similarities between Nuu-chah-nulth and the northern Wakashan languages Kwak'wala and Heiltsuk, postulating that they are related. Building on Boas' work, Sapir (1911b) compares the two branches and proposes several regular sound correspondences between them. Haas (1969, 1972), Jacobsen (1969), Kinkade (1969), and Gamble (1978) have published some comparative and reconstructive work on the southern branch, and more recently, Davidson (2002) compares the grammars of Nuu-chah-nulth and Makah. Apart from those of Boas and Sapir, most of the comparisons between the northern and southern branches of Wakashan have come out of Morris Swadesh's attempt to link Wakashan to Salish and Chemakuan (see Swadesh 1948, Swadesh 1953a and Swadesh 1953b).

1.2.2 Northern Wakashan

Linguistic work on the northern Wakashan languages began in earnest in the late 19th Century. Franz Boas published a vocabulary (Boas 1893) several grammatical descriptions of the Kwak'wala language (Boas 1890b, 1900, 1911), and after his death, an additional grammar was published (Boas 1947). More recently, Grubb (1977) published a dictionary of Kwak'wala, and Levine published a text (1977) and two articles on the passive (1980, 1981). Anderson (1984) presents a treatment of Kwak'wala syntax in the Government and Binding theory of Chomsky (1981) and others, and Kalmar (2003) examines reduplication in Kwak'wala.

Since Boas treated Heiltsuk as a dialect of Kwak'wala, his remarks on its grammar and vocabulary are contained in his works on Kwak'wala (see in particular Boas 1890b and 1947). The 1981 dictionary by Rath includes an excellent grammatical

sketch of the language. Rath also published a paper on the language-specific word classes in Heiltsuk, Oowekyala and Haisla (1984), and a phonological description of Heiltsuk (1977).

Hilton and Rath (1982) present a collection of Oowekyala texts told by Chief Simon Walkus Sr., and translated by Evelyn Walkus Windsor. More recently, Howe's (2000) dissertation examines the phonology of Oowekyala using Optimality Theory.

The literature on Haisla, the northern-most Wakashan language, includes a phonology (Vink 1978), a dictionary with a phonological description (Lincoln and Rath 1986), and a text (Lincoln et al. 1990). Bach has also studied Haisla, including material from it in several articles (e.g., Bach 1996).

1.2.3 Southern Wakashan – Ditidaht and Makah

Aside from the works that I mentioned above, work on Makah includes a dissertation on the syntax of the sentence (Renker 1987), and introductory textbook (Jacobsen 1979, 1995), as well as several articles on the morphology (Jacobsen 1973), phonology (Jacobsen 1971) and syntax and other aspects of the language (Jacobsen 1978, 1986). There is more literature on Ditidaht. Gamble (1978) discusses diachronic change in the language, Haas-Swadesh and Swadesh (1933) and Touchie (1977) provide two Ditidaht texts, and Hess (1990) discusses numerals in Ditidaht. Thomas and Hess (1981) provide an introduction to the Ditidaht language and Carlson and Thomas (1979) discuss inferentials. Klokeid (1978a) examines restrictions on clitics in Ditidaht. Klokeid has written many more papers which are published in the proceedings of the International Conference on Salish and Neighbouring Languages. I refer the reader to the bibliography for a list of Klokeid's publications.

1.2.4 Nuu-chah-nulth

Since Boas' (1890a) short description of Nuu-chah-nulth, several researchers have worked on various dialects of Nuu-chah-nulth. Below, I review the publications on Nuu-chah-nulth in a variety of linguistic fields.

1.2.4.1 Texts

The first published Nuu-chah-nulth text was collected by Sapir (1924), and the remainder also originate from him and his Nuu-chah-nulth collaborator, Alex

Thomas, and are published in four collections (Sapir and Swadesh 1939, 1955, Sapir et al. 2000, 2004). Only five of the 126 published texts contain morphemic analyses. Nakayama edited two volumes of Ahousaht texts by George Louie and Caroline Little (Louie 2003, Little 2003).

1.2.4.2 Grammars

There are three comprehensive grammars of different dialects of Nuu-chah-nulth. Rose (1981) describes the Kyuquot dialect, and Nakayama (2001) the Ahousaht dialect. Davidson (2002) presents a comparative grammar of Makah and the Tseshaht dialect based on the texts published by Sapir and Swadesh.

1.2.4.3 Dictionaries

One dictionary of Nuu-chah-nulth has been published (Nuuchahnulth Tribal Council 1991). Put out by the Nuu-chah-nulth Tribal Council, it has a separate entry for each of the dialects of Nuu-chah-nulth and includes Ditidaht.

1.2.4.4 Phonology

The phonology of Nuu-chah-nulth has been studied fairly extensively, beginning with Sapir's (1938) study of glottalized continuants. Paik (1968) provides a more complete study of the Clayoquot dialect. More recently, Stonham (1999) presents a description of the phonology of the Tseshaht dialect. Rose (1979) examines some morphophonological alternations in Kyuquot,[5] and gives a summary of the phonological traits of Kyuquot in her 1981 grammar. Carlson et al. (2001) present an overview of the phonology and phonetics of Ahousaht. The pharyngeal phonemes of Nuu-chah-nulth and Ditidaht have been studied by Colarusso (1985), Shank and Wilson (2000), and Carlson and Esling (2003). Kim (2000, 2001) looks at glottalization, Hofmann (1984) at intonation, Werle (2002) and Stonham (1994) at prosody, and Kim and Wojdak (2002) and Stonham (2003) at reduplication patterns.

1.2.4.5 Morphology

Swadesh's (1933) dissertation on the morphology of the Tseshaht dialect, a reduced version of which was published as Swadesh 1939, is the first major work on

[5]These alternations are present in other dialects, including Ahousaht.

morphology in Nuu-chah-nulth. Stonham (1990) also discusses Tseshaht morphology. Apart from those works on the more phonological aspect of morphology mentioned above, more recent publications include Yiu and Stonham's (2002) work on classifiers, and Nakayama's (1993) description of the clitic-like behaviour of affixes in Nuu-chah-nulth. One particular morpheme, *-'at*, has received a fair amount of attention. It has been described as "passive," (Sapir and Swadesh 1939, Rose and Carlson 1984, Emanatian 1988) "inverse," (Whistler 1985) and "perspective shifting" (Nakayama 1997, 2001). Braithwaite (2003) looks at the possessive suffix, which can appear as either nominal or verbal inflection.

1.2.4.6 Syntax

Work on the syntax of Nuu-chah-nulth is fairly limited, as the fascinating qualities of the morphology have somewhat overshadowed it. Jacobsen (1979a) argues against the claim (originating from Sapir and Swadesh (1939)) that Nuu-chah-nulth makes no distinction between word classes. Rose (1981) and Wojdak (2001) also argue against it, though from different angles. Jacobsen (1993) looks at subordination and Davis and Sawai (2001) at wh-movement.

1.2.5 DNV Suffixes in the Wakashan Literature

First a word on terminology. What I am calling DNV suffixes are a subclass of Nuu-chah-nulth's "lexical suffixes". The term "lexical suffix" has been used in the Nuu-chah-nulth literature for many years, having an origin in the study of Salishan languages, where it is used to describe a set of suffixes which have noun-like meanings (see Carlson 1990). But, as Davidson (2002, 179) notes, in the terminology of Northwest Coast linguistics it is used for suffixes that "have meanings more typical cross-linguistically of open-class lexical morphemes than closed-class grammatical morphemes," a usage which covers both the Salish noun-like suffixes as well as the Wakashan verb-like ones.

Nakayama (1993) makes the claim (based on Rose's (1981) grammar of the Kyuquot dialect of Nuu-chah-nulth) that multi-word units can act as hosts for affixes. This claim is very similar to Anderson's (1992) claim that special clitics are affixes that apply at the phrase-level rather than word-level. In the same volume Anderson also discusses the properties of Kwak'wala DNV suffixes, whose similarity to those

in Nuu-chah-nulth is unquestionable, though certain differences are apparent (e.g., Kwak'wala allows doubling of the "incorporated" noun, while Nuu-chah-nulth forbids it).

In his grammar of the Ahousaht dialect Nakayama's (2001) compares the DNV suffixes with Zwicky and Pullum's (1983) criteria for clitics and concludes that Nuu-chah-nulth DNV suffixes are not clitics. Instead he notes that the suffixes attach to the word in the noun phrase which has the most scope, which always happens to be the first word.

As Davis and Sawai (2001) point out, WH-words are bound stems which obligatorily take the DNV suffixes. When no DNV suffix is present, a kind of do-support is used, where an auxiliary DNV suffix attaches to the WH-word. Davis and Sawai make the case that Nuu-chah-nulth DNV suffixes do not have the same semantics as those in West Greenlandic. With regard to the semantics of DNV suffixes, they show that Van Geenhoven's (1998b)[6] semantic analysis for West Greenlandic does not fit the data in Nuu-chah-nulth. I discuss the semantics of WH-words with respect to DNVs in §2.2.1.2.

Another work of particular interest is the study of DNV suffixes by Wojdak (2003b). She analyzes them within the frameworks of the Minimalist Program and Distributed Morphology. Her claim is that the incorporated stem is moved at phonological form (PF) to its position as the host of the DNV suffix, which is a normal verb in logical form (LF). DNV suffixes are equivalent to full verbs in their syntax and semantics, differing only in their suffixal nature. I discuss Wojdak's analysis in detail in §3.2.

1.3 Grammatical Sketch of Nuu-chah-nulth

1.3.1 Phonemic Inventory

Nuu-chah-nulth has a large inventory of consonants and a small vowel inventory. There are 35 consonants, including a plain (voiceless) and a glottalized series of stops. Resonants (glides and nasals) also have glottalized forms.

[6]Davis and Sawai cite Van Geenhoven's 1996 dissertation, which was then published as Van Geenhoven (1998b).

(4) **Nuu-chah-nulth Consonants** (based on Nakayama (2001, 7))

		labial	alveolar	palatal	lateral	velar		uvular		pharyngeal	glottal
						unrounded	rounded	unrounded	rounded		
stops	plain	p	t			k	k^w	q	q^w	ʕ	ʔ
	glottalized	p̓	t̓			k̓	$k̓^w$		$(q̓^w)$		
fricatives			s	š	ɬ	x	x^w	(x̣)	$(x̣^w)$	ḥ	h
affricates	plain		c	č	ƛ						
	glottalized		c̓	č̓	ƛ̓						
nasals	plain	m	n								
	glottalized	m̓	n̓								
glides	plain			y			w				
	glottalized			y̓			w̓				

In most words the proto-language's uvular fricatives (*$x̣$ and *$x̣^w$) have become pharyngeal *ḥ* (neutralizing the contrast in rounding), and the glottalized uvulars (*$q̓$ and *$q̓^w$) have become pharyngeal ʕ, but a few words still retain the original phonemes. For example, the word *ƛ̓iicx̣ʷik* "blond" (FW 33) retains the rounded uvular fricative.

The glottal fricative *h* is also a rare sound, but the reason for its rarity differs from that of the uvulars mentioned above. It only appears word-initially (with the possible exception of reduplication).

The vowel system of Nuu-chah-nulth is deceptively simple on the surface. Nuu-chah-nulth has only three vowels, but length is distinctive. In addition to long and short vowels, Nuu-chah-nulth also has phonemic variable-length vowels (more on these below). The surface and underlying vowels are shown in (5). In my notation of the different vowel types I follow Nakayama (2001), whose system is very similar to that of Rose (1981). Double vowels represent a long vowel on the surface, regardless of its underlying value (e.g., *aa*), a colon following a vowel represent an underlying long vowel (e.g., *a:*), and one dot following a vowel represents an underlying variable-length vowel (e.g., *a·*). Short vowels, both surface and underlying, are represented by

[6]Nakayama does not include a rounded uvular fricative in his catalogue of consonant phonemes, but I have an example of a word which contains that phoneme, which I present in the paragraph following the chart.

a single vowel.

(5) **Nuu-chah-nulth Vowels** (based on Nakayama's (2001) analysis)

Surface		Underlying	
i ii	u uu	i iˑ i:	u uˑ u:
a aa		a aˑ a:	

As first noted by Sapir and Swadesh (1939), Nuu-chah-nulth has a set of vowel phonemes called variable-length vowels (a term due to Sapir and Swadesh) which appear long when they are in the first or second syllable of a word, otherwise they appear short. The morpheme *-ʔiˑšˑ* "3.IND", which contains a variable-length vowel, has a surface form with a long vowel when the base is monosyllabic (e.g., in (6)), and with a short vowel when the base is polysyllabic (e.g., in (7)).

(6) sačkʔiiš čʾiima
sačk-ʔiˑš čʾiːma
sharp-3.IND knife
"The knife is sharp." (FW 5)

(7) čʾušukʔiš
čʾuš-uk-ʔiˑš
new-DUR-3.IND
"It is new." (FW 197)

1.3.2 Constituent Order and Inflection

The relative ordering of constituents in Nuu-chah-nulth plays an important role in my analysis, so I will now give an overview to the order of constituents in clauses and noun phrases, including the interaction between word order and inflection.

Basic clausal word order in Nuu-chah-nulth is verb-subject-object (VSO). Subject agreement appears on the verb, and nouns can optionally be marked for definiteness.

(8) kʾʷayʾaapʔiš Kim ƛiisyʾakʔi
kʾʷayʾaˑp-ʔiˑš Kim ƛiːsyʾak-ʔiˑ
break-3.IND Kim pencil-DEF
"Kim broke the pencil." (FW 200)

Nuu-chah-nulth differs from English in that tense is not obligatorily. Tense can be interpreted from context, but in elicited examples there is no context, so I

generally use the past tense in the English translations.

Although VSO is the unmarked order, VOS is possible, particularly when it is clear from context who is the subject and who the object. For example, it is usually animate objects that take inanimate things, not the other way around: thus, *ciyapuxs* "hat" would be an unusual subject of the verb *suk^{w}iƛ* "take", and so VOS order is possible, as shown in (10), in addition to the unmarked VSO order in (9).

(9) suk^{w}iƛʔiš čakupʔi ciyapuxsʔi
su-ši(ƛ)-ʔi·š čakup-ʔi· ciyapuxs-ʔi·
take-MOM-3.IND man-DEF hat-DEF
"The man took the hat." (FW 305)

(10) suk^{w}iƛʔiš ciyapuxsʔi čakupʔi
su-ši(ƛ)-ʔi·š ciyapuxs-ʔi· čakup-ʔi·
take-MOM-3.IND hat-DEF man-DEF
"The man took the hat." (FW 304)

Modifiers appear before the head, with a few exceptions (see Rose (1981)). Note that the definite marker appears on the modifier in (11) rather than the head noun. Such behaviour is far from being unusual—Nakayama (1993) shows that there is a general tendency in Nuu-chah-nulth for a suffix to attach to the first word in the domain it has scope over.

(11) ḵ̓^{w}aẏaaps ċušukʔi ƛiisẏak
ḵ̓^{w}a-sa·p-s ċuš-uk-ʔi· ƛiisẏak
break-MOM.CAUS-1SG new-DUR-DEF pencil
"I broke the new pencil." (FW 206)

Adverbials appear before verbs, and clausal inflection attaches to the adverbs, as in (12). Nakayama (2001) analyzes (at least some) adverb–verb sequences as serialization, which he proposes for other more typical serial verb constructions.This analysis is quite likely correct given the fact that nearly every word, including those with adverbial meaning, can act as the main predicate of a sentence. But note that the verbal morphology (the tense and the subject[7] markers) appear on the adverbial even though they refer to the main verb. This is particularly clear for the subject marker, as it is the subject of the verb *yaacšiƛ* "leave" which is marked on the adverbial *huʔak* "early".

[7]What has been called "mood" in the Nuu-chah-nulth literature is really a combination of aspectual and modal categories. See Nakayama (2001) for discussion.

(12) huʔakitʔiš yaacšiƛ
huʔak-(m)it-ʔiˑš yaːc-ši(ƛ)
early-PAST-3.IND walk-MOM
"He left early." (FW 83)

Both alienable and inalienable possessors follow the possessed noun. Note that it is the head noun that is marked for possession, not the possessor. It is common (though not necessary) for the definite marker to follow the possession marker

(13) maakukʔiš John maḥtʼiiʔakʔi Kim
maːkuk-ʔiˑš John maḥtʼiːaˑkˑ-ʔi Kim
buy-3.IND John house-POSS-DEF Kim
"John bought Kim's house." (FW 340)

(14) sitʼaatʔi ʕiniiƛʔi
sitʼa-ʔat-ʔiˑ ʕiniːƛ-ʔiˑ
tail-INAL.POSS-DEF dog-DEF
"the dog's tail" (FW 52)

To sum up, the basic clausal word order is VSO, although VOS is also possible, and modifiers precede their heads, but possessors follow. Inflectional suffixes typically attach to the first word in the domain with which they are associated.

1.3.3 Morphology

An interesting property of Nuu-chah-nulth is its aversion to prefixes. Though there is some infixation and reduplication[8] and vowel length change, suffixation is the primary form of morphology. Indeed, infixes, reduplication and vowel length changes are almost exclusively triggered by certain suffixes. The suffix *-ʔiḥ[R]* "hunt for" is such a suffix, triggering a reduplication of the first CV of the base. Reduplication is represented by [R] in the morphemic line in the examples.

(15) ʔiʔickʷinʔiḥʔiš piišpišʔi
ʔickʷin-ʔiḥ[R]-ʔiš piːšpiš-ʔiˑ
mouse-hunt.for-3.IND cat-DEF
"The cat is hunting for mice." (FW 111)

Many suffixes have different allomorphs when the stem is vowel-final as opposed to consonant-final. A common examples of this allomorphy is the momenta-

[8]See Kim and Wojdak (2002) for a survey of reduplication types.

neous suffix *-ši(ƛ) ∼ -či(ƛ)*. When the stem is consonant-final, we find *-ši(ƛ)* "MOM", (e.g., in (16)), but when the stem is vowel-final we find *-čiƛ* "MOM" (e.g., (17)).

(16) haʔukšiƛs hupkčuuʔakitk
haʔuk-ši(ƛ)-s hupkču:-a·k-ʔitk
eat-MOM-1SG dumpling-POSS-2SG.REL
"I ate your dumplings." (FW 306)

(17) ṅaacičiƛʔiš qʷiyuʔaaɬqs Kim
ṅa:ci-ši(ƛ)-ʔi·š qʷi-uʔa:ɬ-qs Kim
see-MOM-3.IND REL-find-1SG.REL Kim
"Kim saw what I found." (FW 288)

In addition to phonologically conditioned allomorphy, Nuu-chah-nulth has lexically-specified allomorphy. The durative (and the possessive, which shares the same allomorphy) surfaces on some stems as *-uk* and on others as *-a·k*. A common use of the durative is on adjective roots, where it gives them a stative reading (Rose 1981).[9]

(18) c̓ušuk
c̓uš-uk
new-DUR
"new" (FW 196)

(19) ʕičaak
ʕič-a·k
rotten-DUR
"rotten" (FW 21)

Some lexical items have alternate forms which are used with derivational suffixes (Rose 1981, Nakayama 2001, Davidson 2002). For example, the word for "dog" has a free form, *ʕiniiƛ*, which is used without derivational morphology (shown in (20)), and a bound form, *ʕiɬč-*, which is used as a stem for derivational suffixes like *-ṗu:qs* "smell like" (shown in (21)).

(20) čičimsk̓ukʔisʔiš ʕiniiƛʔi
čims-k̓uk-ʔis-ʔi·š ʕini:ƛ-ʔi·
bear-resembles-DIM-3.IND dog-DEF
"The dog looks like a small bear." (FW 50)

[9]Rose points out that the momentaneous aspect suffix *ši(ƛ)* may also attach to adjective roots, resulting in an inceptive, e.g., *ƛ̓iḥšiƛ* "It reddened" (Rose 1981, 265)

(21) ƛ̓ɨɬčp̓uuqsʔiš
ƛ̓ɨɬč-p̓u:qs-ʔi·š
dog-smell.like-3.IND
"It smells like a dog." (FW 321)

I have given a very brief description of some of the issues surrounding morphology in Nuu-chah-nulth. The complex non-concatenative processes which accompany suffixes and the alternate bound forms of lexical items are only the most frequently encountered phenomena, appearing often in examples in this thesis. Next, let us return to the denominal verb suffixes I introduced at the beginning of this thesis.

1.4 Nuu-chah-nulth Denominal Verb Suffixes

In this section I expand on the properties of DNV suffixes in Nuu-chah-nulth which I introduced above. First I discuss their semantic content (§1.4.1), then I look at what they select as their host (§1.4.2).

1.4.1 Semantic Content of DNV Suffixes

DNV suffixes make a fairly large semantic contribution to the derived word. In fact, the meanings are very much like those of ordinary verb stems in other languages, like English.

(22) **Some Nuu-chah-nulth Verb-like Suffixes**

-'i·c	ingest
-i·ɬ	make
-si:k	complete
-na:ḥ	look for
-ayi·	give
-ʔa·ta	need, lack
-'a·p	buy
-snaʔaɬ	handle, deal with

Because DNV suffixes have meanings similar to those of verb roots in other languages, a word like *ċisqmisʔic* "eat meat" looks like it might involve noun incorporation. However, as Davidson (2002) notes, if we look at the suffixes and their glosses in (22), the meanings are somewhat general, and do not restrict their arguments as English verb roots can. Thus, while there is a suffix that means "ingest",

there is not one that means "drink" (requiring a liquid patient). Johns (2003) notes the same generality of meaning in the Eskimo-Aleut suffixes which Sadock (1980, 1985, 1991) and Baker (1988) analyze as noun-incorporating verbs. But as Davidson (2002) points out, other Nuu-chah-nulth DNV suffixes are more specific than many free verb stems. I list some of his (2002, 187) examples from Tseshaht in (23) below.

(23)

-ʔaƛ̓imč	doing ritual for ... weather
-ʔa·mač[L]	signifying, auguring, casting a spell for ...
-simč	doing ritual for ...
-cawinyuk[L]	doing (esp. give a potlatch) on account of, in honor of ...
-.'inɬ	giving a feast of ...
-si·ḥʔi:	go to ...on a gift visit
-t̓u:ɬa[L]	giving a potlatch or ceremony in honor of ...

DNV suffixes are associated with at least two semantic arguments. In the set of semantic arguments associated with any given DNV suffix, the DNV stem will correspond to that semantic argument which is lower than the others on the thematic hierarchy proposed by Bresnan and Kanerva (1989), given in (24).

(24) AGENT > BENEFICIARY > RECIPIENT/EXPERIENCER > INSTRUMENT > THEME/PATIENT > LOCATIVE

For example, the suffix *-ayi·* "give" takes its theme as a stem, as shown in (25). Here Kim is the agent, Sandy the recipient, and *ńača:ɬƛ̓ak* "book" the theme. Of these three roles, theme is the lowest on the thematic hierarchy and it is also semantic role of stem for the DNV suffix.

(25) ńačaaɬƛ̓akayiʔiš Kim Sandy
ńača:ɬƛ̓ak-ayi·-ʔi·š Kim Sandy
book-give-3.IND Kim Sandy
"Kim gave Sandy a book." (FW 77)

While the thematic hierarchy seems to be a useful descriptive tool, it does not necessarily have a theoretical reality.

I return to the semantics of DNVs in §2.2, where I discuss Johns's (2003) idea of using Koenig and Davis' (2001) lexical modality to account for differences between DNV suffixes, as well as Van Geenhoven's (1996, 1998b) semantics for WH-questions involving DNV suffixes and Davis and Sawai's (2001) critique of its application in Nuu-chah-nulth. I also discuss other claims that Johns (2003) makes in §3.3.2.

1.4.2 Selection of Hosts

As I mentioned on page 1, DVN suffixes can attach to the noun which corresponds to their theme[10], and also to the modifier of the theme. In (1), repeated below as (26), *-'i·c* "ingest" attaches to its theme, *ċisqmis* "meat", while in (2), repeated as (27), it attaches to the modifier of meat, *ʕič* "rotten".

(26) ċisqmisʔicʔiš ʕiniiƛʔi
ċisqmis-'i·c-ʔi·š ʕini:ƛ-ʔi·
meat-ingest-3.IND dog-DEF
"The dog is eating meat." (FW 66)

(27) ʕič'iicʔiš ċisqmis ʕiniiƛʔi
ʕič-'i·c-ʔi·š ċisqmis ʕini:ƛ-ʔi·
rotten-ingest-3.IND meat dog-DEF
"The dog is eating rotten meat." (FW 24)

When a theme is modified, the DNV suffix *must* attach to the modifier: if the DNV suffix were attached to the theme, stranding the modifier, the sentence would be ungrammatical. In (28), the intended meaning is "I am making a nice canoe", but because the DNV suffix *-i·ɬ* "make" is attached to *č̓apac* "canoe" and the modifier *λuɬ* "nice" is stranded, the sentence is ungrammatical. For the sentence to be grammatical, the DNV suffix must attach to the modifier, stranding the theme, as in (29).

(28) *č̓apaciɬsiš λuɬ
č̓apac-i·ɬ-si·š λuɬ
canoe-make-1SG.IND nice
"I am making a nice canoe (intended)." (FW 2)

(29) λuɬiiɬsiš č̓apac
λuɬ -iiɬ -si·š č̓apac
nice-make-1SG.IND canoe
"I'm making a nice canoe." (FW 3)

In addition to nouns and adjectives, DNV suffixes can also attach to a rather contentless stem, *ʔu-*, which I gloss as "TRANS".[11] When *ʔu-* is the host for a DNV

[10] I am using theme in a very general sense here. A better term would be "proto-patient" (Dowty 1991), or "undergoer" (Davis 2001).

[11] The stem *ʔu-* has previously been glossed as "it" by Rose (1981) and Nakayama (2001), but this seems inappropriate since it suggests a kind of object doubling which is otherwise forbidden with

suffix it is possible for a complete NP to appear representing the theme. In other words, *ʔu-* plus a DNV suffix acts like a transitive verb. For example, when *-ʔa·ta* attaches to *ʔu-*, the resulting verb *ʔuʔaata* "need" can take an object such as *λišλiqy̓ak* "pants", as in (30).

(30) ʔuʔaatas λišλiqy̓ak
ʔu-ʔa·ta-s λišλiqy̓ak
TRANS-need-1SG pants
"I need a pair of pants." (FW 131)

If a DNV suffix attaches to a noun, that noun cannot also be a overt NP argument in the sentence. So in (31), *č̓apac* "canoe" cannot appear as a full nominal argument because *č̓apac* is already suffixed with *-i·ɬ* "make". This lack of doubling is similar to that in cases of compounding noun incorporation (Rosen 1989), where the incorporated noun satisfies an argument position of the verb.

(31) *č̓apaciɬʔiš č̓apacʔi
č̓apac-i·ɬ-'i·š č̓apac-ʔi·
canoe-make-3.IND canoe-DEF
"He is making a canoe (intended)." (FW 1)

We have seen that DNV suffixes have strict selectional requirements: when its theme is modified, a DNV suffix must attach to the modifier; DNV suffixes can attach to a contentless stem, *ʔu-*, allowing a full nominal object; the host of a DNV cannot be doubled.

1.5 HPSG

Head-driven Phrase Structure Grammar (henceforth HPSG), developed by Pollard and Sag (1987, 1994), is a non-derivational theory of language. There is nothing equivalent to move-α or the empty categories[12] of the Minimalst Program in HPSG.

Central to the theory of HPSG is the set of rigorous formalisms from which it has been constructed. These formalisms allow the construction of computational

DNV suffixes. Wojdak (2003b,c) glosses this stem as null, which I believe is closer to the truth, since it contributes no particular semantics. However, as I discuss in §§2.1 and 2.6, DNVs formed with *ʔu-* are transitive while those formed with a noun phrase are not.

[12]Pollard and Sag (1994) use an empty category in their analysis of relative clauses, but Hukari and Levine (1996) note inconsistencies with this approach, and Sag (1997) and Ginzburg and Sag (2000) propose analyses which do not require an empty category.

models with which to test a grammar, shining a light through the cracks to see where the grammar over- or under-generalizes. Since this thesis deals with a very small aspect of Nuu-chah-nulth grammar, and I am therefore not implementing a computational model, I will only sketch the basic ideas behind HPSG here. This section is based the description of HPSG in chapter 2 of Kathol 2000.

1.5.1 The Tools of HPSG

There are three notions in HPSG as presented in (Pollard and Sag 1987, 1994) which are important to the linguist trying to analyze a language: feature structures, the multiple-inheritance hierarchy, and structure sharing. In this section I define them in turn, and give examples of the standard notation used to describe them.

The atoms of HPSG are typed feature structures, which consist of a set of features and their value. For instance, the basic linguistic object in HPSG is the sign, which is a pairing of a phonological string with semantic and syntactic features. This can be represented as the feature structure in (32). The label of the type, *sign*, is given in the top left of the matrix. The features which are proper to the type are PHON and SYNSEM. The value of these two features are of types *phonstruc*, which contains phonological features, and *synsemstruc*, which contains syntactic and semantic features.

(32)
$$\begin{bmatrix} \textit{sign} & \\ \text{PHON} & \textit{phonstruc} \\ \text{SYNSEM} & \textit{synsemstruc} \end{bmatrix}$$

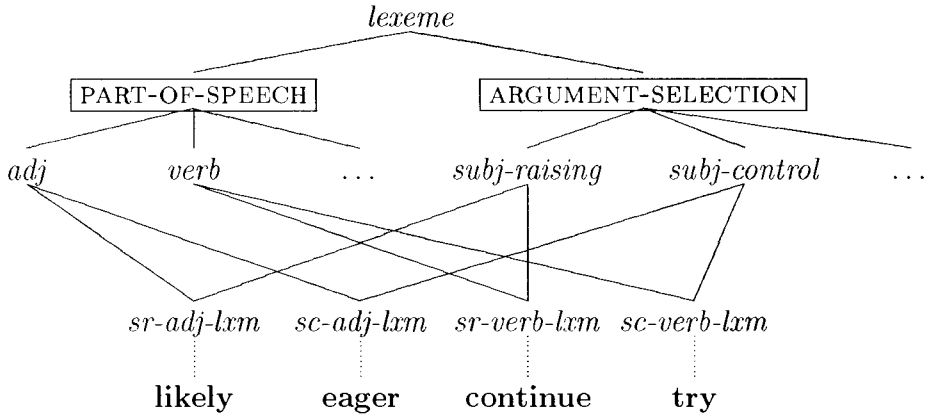
Words and phrases are two kinds of signs; while each adds further restrictions on features, they both share the features PHON and SYNSEM. This relationship is captured by the type hierarchy, or multiple-inheritance hierarchy. Each subtype inherits the restrictions on features (henceforth constraints) of its supertype. In the section of the type hierarchy in (33), the types *word* and *phrase* are both subtypes of *sign*, which is in turn their supertype, and so they both inherit the constraints given for *sign* (given in (32) above).

(33)


Additionally, a given type may inherit the constraints from more than one

supertype. This is particularly useful when trying to capture generalizations along multiple dimensions, e.g., subcategorization and part-of-speech. In (34), a much simplified version of an example from Sag and Wasow (1999, 361), the subtypes of *lexeme* (another subtype of *sign*) must inherit from one of the PART-OF-SPEECH types and one of the ARGUMENT-SELECTION types:

(34)



Subject raising verbs and subject raising adjectives will both inherit the constraints from the type *subj-raising*, while subject control verbs and subject control adjectives inherit the constraints from *subj-control*. Both kinds of adjectives inherit the constraints from *adj*, and both kinds of verbs from *verb*.

Another important notion in HPSG is that of structure sharing, where two (or more) features share the same value. This allows us, for example, to represent case concord within noun phrases by structure sharing the case feature of the noun with that of an adjective that modifies it. Structure sharing is represented by a boxed numeral, like $\boxed{1}$. For example, in (35) FEAT3 and FEAT2 have the same value, *val1*. This feature structure is identical to the one in (36), where *val1* is specified in FEAT3; the difference is in notation only.

(35) $\begin{bmatrix} \text{FEAT1} & \begin{bmatrix} \text{FEAT2} & \boxed{1}\textit{val1} \end{bmatrix} \\ \text{FEAT3} & \boxed{1} \end{bmatrix}$

(36) $\begin{bmatrix} \text{FEAT1} & \begin{bmatrix} \text{FEAT2} & \boxed{1} \end{bmatrix} \\ \text{FEAT3} & \boxed{1}\textit{val1} \end{bmatrix}$

In this section I have provided a description of some of the basic tools of HPSG:

feature structures, the multiple inheritance hierarchy, and structure sharing. Next I demonstrate the use of HPSG in the syntactic analysis of a sentence.

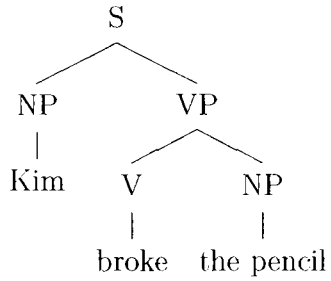
1.5.2 Syntax in HPSG

To see how syntax works in HPSG, I first show how an English sentence is represented, then I turn to a Nuu-chah-nulth example.

Consider the English sentence in (37a), which has the structure given in (37b). I will use this sentence to illustrate how HPSG accounts for various aspects of grammar, such as mapping from semantic arguments to syntactic arguments and the composition of

(37) a. Kim broke the pencil.

b.



First, I discuss the verb in (37a) as a lexeme. It has no tense yet, and it does not agree with its subject — since it is a lexeme, it is not in a sentence. The verb *break* is transitive, and its arguments are represented at three points in its feature structure, shown in (38). The argument structure, or ARG-ST, list mediates between the surface syntax (the valence features) and the semantics (the list of semantic relations (LZT). The first item on the verb's ARG-ST list (1) is mapped to the subject valence feature (SUBJ), and its semantics, represented by 3 following the colon, are linked to the ACT(or) role[13] in the semantic relation *_break-rel*. Likewise, the second item on ARG-ST (2) is mapped to the complements valence feature (COMPS), and its semantics (4) are linked to the UND(ergoer) role.

[13] "The attributes ACT and UND ... are equivalent to Dowty's [1991] proto-agent and proto-patient respectively." Davis (2001, 79)

(38)
$$\left[\begin{array}{l} \textit{trans-verb} \\ \text{PHON} \quad \langle \textit{break} \rangle \\ \text{SYNSEM} \left[\begin{array}{l} \text{CAT} \left[\text{VALENCE} \left[\begin{array}{ll} \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle \boxed{2} \rangle \end{array}\right]\right] \\ \text{ARG-ST} \quad \langle \boxed{1}\text{NP:}\boxed{3},\ \boxed{2}\text{NP:}\boxed{4} \rangle \\ \text{CONT} \left[\begin{array}{l} \text{INDEX} \quad \boxed{5} \\ \text{LZT} \left\{\left[\begin{array}{ll} \textit{break-rel} & \\ \text{EVENT} & \boxed{5} \\ \text{ACT} & \boxed{3} \\ \text{UND} & \boxed{4} \end{array}\right]\right\} \end{array}\right] \end{array}\right] \end{array}\right]$$

What maps the arguments from a verb's ARG-ST to its valence features is the Valence Principle (39). This states that the first item on ARG-ST maps to SUBJ and the remainder will map to COMPS. The SUBJ list will contain only one item, but the COMPS list will contain any direct objects and any prepositional phrase complements a verb might have. The $\oplus$ symbol represents list concatenation, and so the constraint can be stated as follows: the argument structure consists of the singleton SUBJ list plus the contents of the COMPS list, in that order.

(39)
$$\left[\begin{array}{ll} \text{VALENCE} & \left[\begin{array}{ll} \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{COMPS} & \boxed{2} \end{array}\right] \\ \text{ARG-ST} & \langle \boxed{1} \rangle \oplus \boxed{2} \end{array}\right]$$

I am using Minimal Recursion Semantics (Copestake et al. 1995, 1999), which makes use of a list of semantic relations (LZT). The representation of the semantic relations is based on Riehemann's (2001) incorporation of Davis' (2001) insights, where the interpretations of the actor and undergoer roles are dependent on the type of relation they belong to. For instance, in a *have-rel*, the actor is the possessor and the undergoer the possessed. The list of semantic relations of a phrase is the concatenation of the lists of semantic relations of its daughters. The linking from semantic roles to argument structure is more complicated than the Valence Principle which links the argument structure to valence features, and since it is beyond the

scope of this thesis, I refer the reader to Davis (2001) for a discussion of it.

The VP *broke the pencil* has the feature structure in (40). The DAUGHTERS feature contains the entire feature structures of the phrases daughters. The difference between a sentence and a VP in HPSG lies in the state of the valence features. VP, which corresponds to V′ in X-bar theory, has an empty COMPS feature, while a sentence, which corresponds to VP in X-bar theory, also has an empty SUBJ feature. The COMPS feature in (40) has been discharged: it is emptied and its (former) member is in the complement daughter feature (COMP-DTRS). Each phrase inherits its head feature from its head daughter. This VP has the head feature of *broke*, which is of type *verb*. Note that HPSG differs from Minimalist Program syntax in eschewing functional categories and the exploded Infl node.

(40)
$$\left[\begin{array}{l} \textit{verb-phrase} \\ \text{PHON} \quad \boxed{1} \oplus \boxed{2} \\ \text{SYNSEM} \quad \left[\begin{array}{ll} \text{HEAD} & \boxed{3}\textit{verb} \\ \text{VALENCE} & \left[\begin{array}{l} \text{SUBJ} \left\langle \textit{Kim} \right\rangle \\ \text{COMPS} \left\langle \right\rangle \end{array}\right] \end{array}\right] \\ \text{DAUGHTERS} \quad \left[\begin{array}{ll} \text{HEAD-DTR} & \left[\begin{array}{ll} \text{PHON} & \boxed{1}\left\langle \text{broke} \right\rangle \\ \text{SYNSEM} & \boxed{4}\left[\text{HEAD} \quad \boxed{3}\right] \end{array}\right] \\ \text{COMP-DTRS} & \left[\begin{array}{ll} \text{PHON} & \boxed{2}\left\langle \text{the pencil} \right\rangle \\ \text{SYNSEM} & \boxed{5} \end{array}\right] \end{array}\right] \end{array}\right]$$

A sentence is very similar in structure to a verb phrase in HPSG. The differences are that a sentence has subject daughter (SUBJ-DTR) feature and its SUBJ feature is empty, and that its head daughter is a VP.

(41)
$$\left[\begin{array}{l} \textit{sentence} \\ \text{PHON} \quad \boxed{2} \oplus \boxed{1} \\ \text{SYNSEM} \quad \left[\begin{array}{ll} \text{HEAD} & \boxed{3}\textit{verb} \\ \text{VALENCE} & \left[\begin{array}{l} \text{SUBJ } \langle\rangle \\ \text{COMPS } \langle\rangle \end{array}\right] \end{array}\right] \\ \text{DAUGHTERS} \quad \left[\begin{array}{ll} \text{HEAD-DTR} & \left[\begin{array}{ll} \text{PHON} & \boxed{1}\left\langle \text{broke the pencil} \right\rangle \\ \text{SYNSEM} & \boxed{4}\left[\text{HEAD} \quad \boxed{3}\right] \end{array}\right] \\ \text{SUBJ-DTR} & \left[\begin{array}{ll} \text{PHON} & \boxed{2}\left\langle \text{Kim} \right\rangle \\ \text{SYNSEM} & \boxed{5} \end{array}\right] \end{array}\right] \end{array}\right]$$

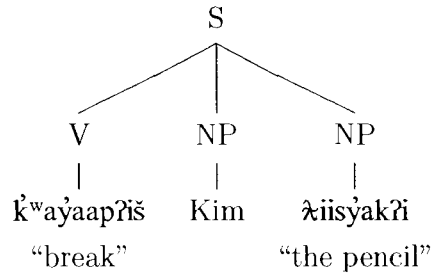
Now I turn to an HPSG analysis of basic Nuu-chah-nulth syntax. The Nuu-chah-nulth sentence which corresponds to (37a) is (8), which I repeat in (42).

(42) k̓ʷaẏaapʔiš Kim ƛiisẏakʔi
k̓ʷa-sa·p-ʔi·š Kim ƛiisẏak-ʔi·
break-MOM.CAUS-3.IND Kim pencil-DEF
"Kim broke the pencil." (FW 200)

The verb in (42) is marked for subject agreement, and its feature structure (shown in (43)) reflects this. The first item on the verb's ARG-ST list must be third person, and it appears in the SUBJ list.

(43)
$$\left[\begin{array}{l} \textit{k̓}^{w}\textit{a}\dot{y}\textit{aap}\textit{ʔiš} \\ \text{PHON} \quad \left\langle \text{k̓}^{w}\text{a}\dot{y}\text{aapʔiš} \right\rangle \\ \text{SYNSEM} \left[\begin{array}{ll} \text{CAT} & \left[\text{VALENCE} \left[\begin{array}{ll} \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle \boxed{2} \rangle \end{array}\right]\right] \\ \text{ARG-ST} & \langle \boxed{1}\text{NP:}\boxed{3}\text{3RD}, \boxed{2}\text{NP:}\boxed{4} \rangle \\ \text{CONT} & \left[\begin{array}{ll} \text{INDEX} & \boxed{5} \\ \text{LZT} & \left\langle \left[\begin{array}{ll} \textit{\_k̓}^{w}\textit{a}\dot{y}\textit{aap-rel} & \\ \text{EVENT} & \boxed{5} \\ \text{ACT} & \boxed{3} \\ \text{UND} & \boxed{4} \end{array}\right] \right\rangle \end{array}\right] \end{array}\right] \end{array}\right]$$

There are two possible analyses of the constituency of the sentence in (42). Because word order is VSO, the verb and object do not form a constituent, at least on the surface. This suggests that the sentence has a flat structure, such as that in (44). VPs, that is, verb phrases which have an empty COMPS list but a non-empty SUBJ list, do not exist in Nuu-chah-nulth.

(44)


Binding facts in Nuu-chah-nulth do not help determine whether or not the sentence has flat structure. There are no reflexive pronouns in the language: it has a bound reflexive stem *ʔukʷ-* that DNV suffixes attach to. In case the verb is not a DNV, an auxilliary suffix is attached to the bound stem, and this word precedes the free verb Rose (1981). The reflexive verb in (45) cannot have another argument,[14]

[14]Because no detransitivizing morphology applies to free transitive verbs, I suspect that *ʔuk-* forms transitive verbs with a non-canonical argument which is co-indexed with the subject. Reflexives in Nuu-chah-nulth are understudied, and so for now I can only speculate on this matter.

and it provides no evidence either for or against a flat structure.

(45) ʔukʷanaƛ̓uuḥšiƛʔiš John
ʔukʷ-ʾinaƛ̓uːḥ-ši(ƛ)-ʔiˑš John
REFL-look.at-MOM-3.IND John
"John saw himself." (FW 322)

I should note that binding does not centre around the notion of c-command in HPSG. Instead, binding principles are stated with reference to relative positions on ARG-ST.[15] The farther right an argument is on an ARG-ST list, the more oblique it is. For an argument α to bind another argument β, β must be more oblique than α. Thus, in the argument structure in (46), 1 can bind 2 or 3, but neither 2 nor 3 can bind 1, and so on.

(46) $\langle$1, 2, 3$\rangle$

Some sentences in Nuu-chah-nulth have null arguments. In (47), while there is an object NP (*ʕuy̓i* "medicine"), there is no overt subject NP, but the agreement morphology on the verb indicates that the subject is third person.

(47) watqšiƛʔiš ʕuy̓i
watq-ši(ƛ)-ʔiˑš ʕuy̓i
swallow-MOM-3.IND medicine
"He swallowed medicine." (FW 277)

The subject must appear on the verb's ARG-ST list, since subject agreement is specified there, but must not appear in the valence feature SUBJ, because it does not manifest itself in syntactic subject. HPSG provides a subtype of *synsemstruc*, which are the formal constituents of ARG-ST, that can only appear on ARG-ST lists and can never be part of a word. These non-canonical synsem structures (*non-canon*), such as PRO, act as placeholders, and the Valence Principle in (48), modified in the spirit of Malouf (1999) and Bouma et al. (2001), ensures that no *non-canon* appears in the valence features. The valence features consist of everything in ARG-ST as before, except that all non-canonical synsems are removed from the them in a operation denoted by $\ominus$. This is a standard treatment in HPSG, which eschews empty categories.

[15] Wechsler and Arka (1998) and Wechsler (1999) show that argument structure binding in HPSG can account for data in Balinese which c-command binding cannot.

(48)
$$\begin{bmatrix} \text{VALENCE} & \begin{bmatrix} \text{SUBJ} & \langle \boxed{1} \rangle \ominus \textit{list(non-canon)} \\ \text{COMPS} & \boxed{3} \ominus \textit{list(non-canon)} \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1} \rangle \oplus \boxed{3} \end{bmatrix}$$

The feature structure for ***watqšiλʔiš*** "swallow" is given in (49). The first item on its ARG-ST is PRO, which, as a non-canonical synsem, has been subtracted from the SUBJ list, leaving it empty. But like all verbs with third person agreement, the first item on its ARG-ST is third person.

(49)
$$\begin{bmatrix} \textit{watqšiλʔiš} & & & \\ \text{PHON} & \langle \text{watqšiλʔiš} \rangle & & \\ \text{SYNSEM} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{VALENCE} & \begin{bmatrix} \text{SUBJ} & \langle\rangle \\ \text{COMPS} & \langle \boxed{1} \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \langle \text{PRO}_{\textit{third}}\text{:}\boxed{2}, \boxed{1}\text{NP:}\boxed{3} \rangle & \\ \text{CONT} & \begin{bmatrix} \text{INDEX} & \boxed{4} & \\ \text{LZT} & \left\langle \begin{bmatrix} \textit{\_watqšiλ-rel} & \\ \text{EVENT} & \boxed{4} \\ \text{ACT} & \bullet \\ \text{UND} & \boxed{3} \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

Now that I have described the underlying assumptions and basic tools of HPSG, I turn next to morphology.

1.5.3 Morphology in HPSG

Morphology has been handled in two distinct ways in HPSG: one involves some formulation of lexical rules, while the other relies on the type hierarchy. In this thesis I use the type-based approach introduced by Riehemann (1993, 1998, 2001) and Koenig (1999). In this section I first discuss lexical rules, then type-based morphology.

Both lexical rules and type-based morphology are feasible in HPSG, as Meurers (1995) and Riehemann (1993, 1998, 2001) show. Lexical rules are typically written as in (50) below. The input to the rule is on the left of the arrow, and the output is on the right.

(50)
$$\begin{bmatrix} \textit{lexeme} \\ \text{PHON} \quad \boxed{1}\ (=\text{stem}) \\ \text{SYNSEM}\,|\,\text{CAT}\,|\,\text{HEAD} \begin{bmatrix} \textit{noun} \\ \text{PLURAL} \quad - \end{bmatrix} \end{bmatrix} \Longrightarrow \begin{bmatrix} \textit{word} \\ \text{PHON} \quad f_{plural}(\boxed{1})\ (=\text{stem+/s/}) \\ \text{SYNSEM}\,|\,\text{CAT}\,|\,\text{HEAD} \begin{bmatrix} \textit{noun} \\ \text{PLURAL} \quad + \end{bmatrix} \end{bmatrix}$$

The rule only applies to noun lexemes that are not plural, and results in a noun word that is plural. The value of PHON in the output of the rule is a function of the PHON value of the input. This function will, for example, concatenate /s/ onto the end of the word /kæt/.

The derivational nature of lexical rules does not fit well with the non-derivational nature of HPSG, though they have been rewritten as constraints on types (see Meurers 1995). A less derivational approach to morphology is the type-based approach of Riehemann (1998, 2001) and Koenig (1999). Though Riehemann concentrates on derivational morphology, we can imagine a type-based version of the lexical rule in (50), which I give in (51). The entire feature structure is equivalent to the output of the lexical rule in (50), except that it has a STEM feature[16] that is equivalent to the input of the lexical rule. Thus, the phonological value of the plural is a function (f_{plural}) of the phonology of the stem. The head feature PLURAL of the stem must be negative, but is positive in the plural noun word.

(51)
$$\begin{bmatrix} \textit{plural-noun-word} \\ \text{PHON} \quad f_{plural}(\boxed{1}) \\ \text{SYNSEM}\,|\,\text{CAT}\,|\,\text{HEAD} \begin{bmatrix} \textit{noun} \\ \text{PLURAL} \quad + \end{bmatrix} \\ \text{STEM} \left\langle \begin{bmatrix} \textit{noun-lexeme} \\ \text{PHON} \quad \boxed{1} \\ \text{SYNSEM}\,|\,\text{CAT}\,|\,\text{HEAD} \begin{bmatrix} \textit{noun} \\ \text{PLURAL} \quad - \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

[16]Riehemann uses the name MORPH-B (morphological base) for the feature I call STEM, while Koenig (1999) uses μ-STRUCT. The STEM is list-valued in order to accommodate compounds.

1.6 Outline

The rest of the thesis is laid out as follows. In Chapter 2, I present data from Nuu-chah-nulth which shows that DNV suffixes "incorporate" an entire NP, that DNVs are intransitive, and that DNV suffixes appear on the first word of their incorporated NP. I compare Nuu-chah-nutlh DNVs with those in West Greenlandic, Kwak'wala, and Halkomelem in Chapter 3, where I compare my analysis of Nuu-chah-nulth with that of Wojdak (2003a,b,c) and with Sadock's (1991) and Johns' (2003) analyses of Eskimo-Aleut.

Chapter 2
Analysis

First, in §2.1 I show that the DNV host is not in the argument structure of the resulting DNV. In §2.2 I discuss the semantics of DNVs, in particular, the kinds of semantic relations they represent, and the semantics of WH-questions with DNVs. Then I turn to the issue of the placement of DNV suffixes in §2.3.1.

2.1 What Kind of Argument is the Host?

In this section I address the question of whether the DNV host is represented on the argument structure of the resulting verb. I show with evidence from passivization and imperative agreement patterns that the host phrase is not visible in argument structure, and that the resulting verb is therefore intransitive.

To begin, I describe the passive construction and how it interacts with denominal verbs in §2.1.1, then I move to imperative agreement in §2.1.2. I summarize my arguments in §2.1.3.

2.1.1 Passives

The nature of the passive suffix *-'at* has been a subject of debate in the literature;[1] in particular, there is little consensus on whether it is a passive (Rose and Carlson 1984), an inverse (Whistler 1985), or something else (Nakayama 2001). In this section I show that denominal verbs which represent predicates with two arguments are similar to intransitive — rather than transitive — verbs in their unpassivizability.

2.1.1.1 The Nuu-chah-nulth Passive

The passive suffix *-'at* and the past/passive portmanteau *-'ant* signify that subject is what would be the object in the active counterpart to the sentence. For example, *Bill* is the object of the active sentence in (52a), but is the subject in the passive in (52b). While the subject marking does not help determine which is the subject and which the object, word order makes it clear: the subject precedes the object.

[1] See Nakayama 1997 for a summary of this debate.

(52) a. ƛ̓aacičiƛitʔiš John Bill
ƛ̓a:ci-ši(ƛ)-(m)it-ʔi·š John Bill
see-MOM-PAST-3.IND John Bill
"John saw Bill." (FW 410)

b. ƛ̓aacičiʔantʔiš Bill John
ƛ̓a:ci-ši(ƛ)-'ant-ʔi·š Bill John
see-MOM-PAST.PASS-3.IND Bill John
"Bill was seen by John." (FW 411)

Unlike a typical passive, *-'at/-'ant* is disallowed when the two arguments of a verb are non-third person (Nakayama 2001). Thus, there are no passive counterparts to sentences (53a) and (54a).

(53) a. ƛ̓aacičiƛits suutiɬ
ƛ̓a:ci-ši(ƛ)-(m)it-s su:tiɬ
see-MOM-PAST-1SG 2SG.OBJ
"I saw you." (FW 479)

b. *ƛ̓aacičiʔantʔick siičiɬ
ƛ̓a:ci-ši(ƛ)-'ant-ʔick si:čiɬ
see-MOM-PAST.PASS-2SG.IND 1SG.OBJ
"You were seen by me (intended)." (FW 482)

(54) a. ƛ̓aacičiƛitʔick siičiɬ
ƛ̓a:ci-ši(ƛ)-(m)it-ʔick si:čiɬ
see-MOM-PAST-2SG.IND 1SG.OBJ
"You saw me." (FW 480)

b. *ƛ̓aacičiʔants suutiɬ
ƛ̓a:ci-ši(ƛ)-'ant-s su:tiɬ
see-MOM-PAST.PASS-1SG 2SG.OBJ
"I was seen by you (intended)." (FW 481)

Also, if the subject of an active sentence would be third person, but the object first or second, the passive must be used to "invert" the two arguments (Whistler 1985). We can see this in the two sentences (55) and (56a). *John* is doing the seeing in both sentences, but in (55) the theme is *quʔušin* "raven", while in (56a) the theme is first person, requiring the passive *-'at*. This causes the syntactic subject to be first person, rather than third person, as evidenced by the agreement on the verb. The active counterpart to (56a) in (56b) is ungrammatical.

(55) ƛ̓aaciči*ƛ*ʔiš John quʔušin
ƛ̓a:ci-ši(*ƛ*)-ʔi·š John quʔušin
see-MOM-3.IND John raven
"John saw a raven." (FW 339)

(56) a. ƛ̓aaciči?ats John
ƛ̓a:ci-ši(*ƛ*)-'at-s John
see-MOM-PASS-1SG John
"John saw me." (FW 325)

b. *ƛ̓aaciči*ƛ*ʔiš John siičɬ
ƛ̓a:ci-ši(*ƛ*)-ʔiš John si:čɬ
see-MOM-3.IND John 1SG.OBJ
"John saw me." (FW 483)

Restrictions such as these on person and syntactic role in active and passive sentences is not limited to Nuu-chah-nulth. As Jelinek and Demers (1983) show, many Coast Salish languages exhibit similar restrictions. That *-'at* is not a typical passive is quite clear, but I am not attempting to resolve the question of its nature here. What is important is that it can only apply to transitive verbs. An intransitive verb such as *waʔič* "sleep" cannot be passivized/inverted, as the sentences in (57) show.

(57) a. waʔičitʔiš Sandy
waʔič-(m)it-ʔi·š Sandy
sleep-PAST-3.IND Sandy
"Sandy slept." (FW 412)

b. *waʔičantʔiš Sandy
waʔič-'ant-ʔi·š Sandy
sleep-PAST.PASS-3.IND Sandy
(FW 413)

In the next section I discuss an analysis of passives in HPSG and how it applies to the Nuu-chah-nulth data I have just presented.

2.1.1.2 HPSG version of the passive

Manning and Sag's (1999) analysis of passives in HPSG assumes that the argument structure of a passive verb is different from that of the corresponding active verb. In order to account for binding facts in various languages, Manning and Sag

propose to imbed the verb's original argument structure in the new passive one, but replacing the second item (which also appears as the first item on the new argument structure) with a placeholder PRO. I give their (1999, 69) passive lexical rule in (58) below.

(58)
$$\left[\begin{array}{ll} \textit{passive-drv} & \\ \text{RESULT} & \left[\begin{array}{ll} \textit{pass-v-lxm} & \\ \text{ARG-ST} & \left\langle \boxed{2}_j, \left\langle \boxed{1}, \text{PRO}_j \right\rangle \oplus \boxed{3} \right\rangle \\ \text{CONT} & \boxed{4} \end{array}\right] \\ \text{SOURCE} & \left[\begin{array}{ll} \textit{trans-v-lxm} & \\ \text{ARG-ST} & \left\langle \boxed{1}, \boxed{2} \right\rangle \oplus \boxed{3} \\ \text{CONT} & \boxed{4} \end{array}\right] \end{array}\right]$$

There are only two items on the ARG-ST list of the result in (58), the logical object and the original ARG-ST list of the source (with PRO standing in for the logical object). For the valence mapping to work out with an imbedded list, Manning and Sag make use of a compression function which removes all PROs and raises the rest of the arguments on the imbedded list up to the top-most list. Remember that the argument structure list is equal to the concatenation of the valence lists. Our original Valence principle looked like (59a), where the argument structure list is broken down into two smaller lists, $\boxed{1}$ and $\boxed{2}$. The first list contains only one item while the second contains the remainder. Manning and Sag's (1999, 74) valence principle is given in (59b). Here the value of COMPS is the compression of the remainder of ARG-ST.

(59) a.
$$\left[\begin{array}{ll} \text{VALENCE} & \left[\begin{array}{ll} \text{SUBJ} & \boxed{1} \\ \text{COMPS} & \boxed{2} \end{array}\right] \\ \text{ARG-ST} & \boxed{1} \oplus \boxed{2} \end{array}\right]$$

b.
$$\left[\begin{array}{ll} \text{VALENCE} & \left[\begin{array}{ll} \text{SUBJ} & \boxed{1} \\ \text{COMPS} & \text{compression}(\boxed{2}) \end{array}\right] \\ \text{ARG-ST} & \boxed{1} \oplus \boxed{2} \end{array}\right]$$

To see just how compression works, consider the AVM in (60). The value of the COMPS list in (60) is the list of everything on ARG-ST except for the first item,

which is the only item on the SUBJ list. The result of compression in the value of COMPS is a list containing [1].

(60)
$$\begin{bmatrix} \text{VALENCE} & \begin{bmatrix} \text{SUBJ} & \langle \boxed{2} \rangle \\ \text{COMPS} & \text{compression}(\langle\langle \boxed{1}, \text{PRO}_j \rangle\rangle) = \langle \boxed{1} \rangle \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{2}_j, \langle \boxed{1}, \text{PRO}_j \rangle \rangle \end{bmatrix}$$

The passive lexical rule described in (58) does not conform with the type-based morphology I am assuming, but it can easily be converted. The type declaration in (61) corresponds to the result of the lexical rule in (58) with the source imbedded in the STEM feature. The stem's argument structure is the second item on the argument structure of the passive lexeme, except that the second item on this imbedded list is a PRO which is co-indexed to the first item on the passive lexeme's argument structure list.

(61)
$$\begin{bmatrix} \textit{passive-lxm} & \\ \text{ARG-ST} & \langle \boxed{2}_j, \langle \boxed{1}, \text{PRO}_j \rangle \oplus \boxed{3} \rangle \\ \text{STEM} & \begin{bmatrix} \textit{trans-v-lxm} & \\ \text{ARG-ST} & \langle \boxed{1}, \boxed{2} \rangle \oplus \boxed{3} \\ \text{CONT} & \boxed{4} \end{bmatrix} \\ \text{CONT} & \boxed{4} \end{bmatrix}$$

The effect of the passive lexeme constraint might be clearer with an example. The verb *ṅaaačiʔantʔiš* in (62a) is a passive whose stem is *ṅaaačiƛ*. The partial feature structure of the uninflected *ṅaaačiʔant* in (62b) contains the lexeme *ṅaaačiƛ* in its STEM feature. The first item on the argument structure list of the passive lexeme is co-indexed to a PRO in the imbedded argument structure list. This imbedded argument structure corresponds to that of the stem with the exception that the second item is a PRO co-indexed to the first item on the outer argument structure. The semantics of the stem are passed through to the passive without change.

(62) a. ṅaaličiʔantʔiš quʔušin John
ṅa:ci-ši(ƛ)-'ant-ʔiš quʔušin John
see-MOM-PAST.PASS-3.IND raven John
"The raven was seen by John." (FW 409)

b.
$$\left[\begin{array}{ll} \textit{ṅaaličiʔant} \wedge \textit{passive-lxm} & \\ \text{PHON} & \langle \text{ṅaaličiʔant} \rangle \\ \text{VALENCE} & \left[\begin{array}{ll} \text{SUBJ} & \langle \boxed{2} (= \text{quʔušinʔi}) \rangle \\ \text{COMPS} & \langle \boxed{1} (= \text{John}) \rangle \end{array}\right] \\ \text{ARG-ST} & \langle \boxed{2}\text{:}\boxed{5}, \langle \boxed{1}\text{:}\boxed{4}, \text{PRO}\text{:}\boxed{5} \rangle \rangle \\ \text{STEM} & \left[\begin{array}{ll} \text{PHON} & \langle \text{ṅaaličiƛ} \rangle \\ \text{ARG-ST} & \langle \boxed{1}\text{:}\boxed{4}, \boxed{2}\text{:}\boxed{5} \rangle \\ \text{CONT} & \boxed{3} \end{array}\right] \\ \text{CONT} & \boxed{3}\left[\begin{array}{ll} \textit{ṅaaličiλ-rel} & \\ \text{ACT} & \boxed{4} (\text{seer}) \\ \text{UND} & \boxed{5} (\text{seen}) \end{array}\right] \end{array}\right]$$

2.1.1.3 Passives and Denominal Verbs

While ordinary transitive verbs like *ṅaaličiλ* "see" can passivize, most DNVs, such as those formed with *-ʔa·ta* "need", cannot. Thus, the sentence in (63b) is ungrammatical because of the passive suffix.

(63) a. qʷaċaɬʔapʔiš piišpiš
qʷaċaɬ-'a·p-ʔi·š pi:špiš
pretty-buy-3.IND cat
"Ryan bought a pretty cat." (FW 509)

b. *qʷaċaɬʔapatʔiš piišpiš
qʷaċaɬ-'a·p-'at-ʔi·š pi:špiš
pretty-buy-PASS-3.IND cat
"A pretty cat was bought (intended)." (FW 510)

Some DNVs, however, can passivize; they crucially differ from those that cannot in being syntactically transitive. Two kinds of DNVs which can passivize are those

which are semantically ditransitive and those which have *ʔu-* as their stem.

The suffix *-ayiˑ* "give" has three semantic arguments: agent, recipient, and theme. When one of these argument (the theme) is the host, there remain two semantic arguments which map to syntactic arguments. Thus, the verb is syntactically transitive and it can therefore passivize.

In (25), repeated as (64a) below, and (64b) *Kim* is the agent, *Sandy* the recipient, and *ńačaaɬƛ̓ak* the theme.

(64) a. ńačaaɬƛ̓akayiʔiš Kim Sandy
ńačaːɬƛ̓ak-ayiˑ-ʔiˑš Kim Sandy
book-give-3.IND Kim Sandy
"Kim gave Sandy a book." (FW 77)

b. ńačaaɬƛ̓akayantʔiš Sandy
ńačaːɬƛ̓ak-ayiˑ-ant-ʔiˑš Sandy
book-give-PAST.PASS-3.IND Sandy
"Sandy was given a book. " (FW 78)

The theme *ńačaaɬƛ̓ak* "book" cannot be the A-object in (64a) because it is *Sandy* that becomes the subject when the verb is passivized. In the argument structure of the verb in (64a), the first two positions correspond to the actor (giver) and the undergoer (receiver).

(65)
$$\begin{bmatrix} \textit{ńačaaɬƛ̓akayi} & \\ \text{ARG-ST} & \langle \boxed{1}_i, \boxed{2}_j \rangle \\ \text{CONT} & \begin{bmatrix} \textit{give-rel} & \\ \text{ACT} & i \\ \text{UND} & j \\ \text{SOA} & \textit{have-rel} \end{bmatrix} \end{bmatrix}$$

The difference between a verb formed with *-ayiˑ* "give" and one formed with *-ʔaˑta* "need" is there is an additional argument on the ARG-ST of the former. This additional argument allows for passivization, which is prohibited in *-ʔaˑta* verbs.

In his treatment of DNVs in West Greenlandic, Malouf (1999) proposes that the host noun is represented as a non-canonical argument on the ARG-ST of the resulting verb. Could the DNV host be a non-canonical in Nuu-chah-nulth? Would this explain why the host is not available for passivization? We could easily specify that a passive verb must have an ordinary canonical argument in second position on

its stem's ARG-ST. But this would not be correct, since non-canonical objects can also passivize in Nuu-chah-nulth.

The subject of the passive in (56a), repeated as (66) below, is first person and is only marked by the agreement on the verb. Agreement is handled through constraints on members of the verb's ARG-ST (see §1.5.2), and so there is a non-canonical first person argument as the subject of this passive. So we cannot explain the lack of passivization on DNVs by treating the host phrase as a non-canonical argument as Malouf does in West Greenlandic.

(66) ƛ̓aacičiʔats John
ƛ̓a:ci-ši(ƛ)-'at-s John
see-MOM-PASS-1SG John
"John saw me." (FW 325)

The other case where a denominal verb can be passivized is where its host is not part of a noun phrase. Every DNV suffix can take *ʔu-* as its host, and when it does so, it can be passivized.

(67) ʔuyuʔaaɬatʔiš ʕiniiƛ
ʔu-(y)uʔa:ɬ-'at-ʔiš ʕini:ƛ
TRANS-find-PASS-3.IND dog
"A dog was found." (FW 484)

I will discuss *ʔu-* (and other grammatical stems) in §2.6 where I show that it forms a construction that is different in several respects from those where a nominal is the host of the DNV suffix. The differences are because *ʔu-* forms are transitive verbs.

We have seen in this section that the host phrase of DNV suffixes does not count towards transitivity for the the passive *-'at/-'ant* morphology. Given the HPSG account of passives described in §2.1.1.2, this can be explained only if the host phrase does not appear on the DNV's ARG-ST. Next, I provide additional evidence for this conclusion from the limited object agreement in Nuu-chah-nulth.

2.1.2 Agreement

The limited object agreement in Nuu-chah-nulth provides evidence against the hosts of DNV suffixes being logical objects. In §2.1.2.1, I show that the imperative agreement paradigm marks both subject and object, and I consider an HPSG representation of imperative agreement in §2.1.2.2. Next I turn to the imperative in

DNVs, and show that, while in most cases imperative agreement is indecisive with respect to transitivity, in the case of *-ayiˑ* "give", it shows that the DNV host is not the syntactic object.

2.1.2.1 Object Agreement in Nuu-chah-nulth

In most of the person-modal paradigms, the verb agrees only with the subject, but in the imperative, there is agreement with the object as well (Nakayama 2001). The object in an imperative can be either 1SG, 1PL, or 3.[2] For example, the verb *tiic* "follow" agrees in person and number with the 1SG object in (68a), but with the 1PL object in (68b).

(68) a. tiicʔiis
ti:c-ʾiˑs
follow-2SG>1SG.IMP
"Follow me." (FW 453)

b. tiicʔin
ti:c-ʾin
follow-2SG>1PL.IMP
"Follow us." (FW 478)

It may look as though the verbs in (68) are only agreeing with one argument, but this is not the case. The subject of an imperative can be either 2SG, 2PL, or 1PL,[3] and the morphology reflects this (Nakayama 2001). While the verbs in both (69) and (68a) have a 1SG object, the subject in (68a) is 2SG, while that in (69) is 2PL.

(69) tiicʔiičas
ti:c-ʾiˑčas
follow-2PL>1SG.IMP
"You guys follow me." (FW 455)

Intransitive verbs can of course also appear in the imperative, and here, as Davidson (2002) points out, we can see that the suffixes which Nakayama (2001) lists

[2]Nakayama (2001, 38) does not discuss the fact that what he calls the third-person object form also applies to intransitives, which I discuss below.

[3]The 1PL paradigm has one form *-ʾin*, which Nakayama lists as agreeing with a third person object. Presumably agreement with first person objects is prohibited by binding restrictions.

as agreeing with third person objects are not agreeing with any object at all; rather, they mark both transitives with third person objects and intransitives.

(70) a. **tuuxšiʔi**
tu:x-ši(ƛ)-'i·
jump-MOM-2SG.IMP
"Jump!" (FW 463)

b. **hupiiʔi** John
hupi:-'i· John
help-2SG.IMP John
"Help John!" (FW 462)

c. **hupiiʔi**
hupi:-'i·
help-2SG.IMP
"Help him!" (FW 461)

The intransitive verb in (70a) takes the same suffix as the transitive verbs in (70b) and (70c). One could postulate two sets of suffixes, one for intransitives and one for transitives with third person objects which just happen to be have the same form, but this seems unnecessarily complex. A simpler solution is that there is one set of suffixes which marks only the subject, leaving third person objects unmarked on transitives.

The object agreement helps to differentiate direct objects from indirect objects in the case of ditransitive verbs. The agreement on the ditransitive verb *qa:ci:* "give.food" shows that the recipient ("me") is the direct object: if the theme (*sapni* "bannock") were the direct object we would find the same agreement suffix *-'i·* as the other sentences in (70.

(71) qaaciiʔis sapni
qa:ci:-'i·s sapni
give.food-2SG>1SG.IMP bannock
"Give me some bannock." (FW 521)

To summarize, in the imperative, both subject and object are marked on the verb, with the exception of third person objects which are unmarked.

(72) (Adapted from Nakayama (2001, 38))

Subject	Object		
	1SG	1PL	Unmarked
2SG	-ʔiːs	-ʔin	-ʔiː
2PL	-ʔiːčas	-ʔiːčin	-ʔiːč
1PL	—	—	-ʔin

2.1.2.2 Object Agreement in HPSG

Argument structure, not the valence features, is the locus of object (and subject) agreement. We can see this when there is no overt NP object in an imperative sentence.

(73) hupiʔičas
hupi-ʔiːčas
help-2PL>1SG.IMP
"You guys help me." (FW 459)

If, as I suggested in §1.5.2, we treat a verb with a covert argument as having PRO appear on their argument structure list rather than a full phrasal argument, the locus of agreement must be ARG-ST.

(74)
$$\begin{bmatrix} \textit{2pl>1sg.imp-verb} \\ \text{PHON} \quad \langle \text{hupiʔičas} \rangle \\ \text{SYN} \mid \text{VALENCE} \quad \begin{bmatrix} \text{SUBJ} \ \textit{empty} \\ \text{COMPS} \ \textit{empty} \end{bmatrix} \\ \text{ARG-ST} \quad \langle \text{PRO:2PL, PRO:1SG} \rangle \end{bmatrix}$$

Because the two arguments are PRO, they do not appear on the valence list.If the locus of agreement were the valence features, then PRO-drop could not be accounted for, since the valence features are empty in such cases.

Agreement, then, is a restriction on the items in the argument structure list of a verb. If, as in (73), a verb is marked with the 2PL>1SG.IMP suffix, the first item on its ARG-ST must be 2PL, and the second must be 1SG, just as the feature structure in (74) shows. An intransitive verb, however, can only be marked with the unmarked-object set of imperatives, since it has no second item on its ARG-ST.

(75) $\begin{bmatrix} \textit{tuuxši?i} \wedge \textit{2sg.imp-verb} \\ \text{PHON} \quad \langle \text{tuuxši?i} \rangle \\ \text{ARG-ST} \quad \langle \boxed{1}\text{:2SG} \rangle \end{bmatrix}$

2.1.2.3 Object Agreement on Denominal Verbs

Most denominal verbs take only the unmarked object set of imperative suffixes, telling us nothing about the objecthood of the host. The example in (76) takes the same suffix as the intransitive and transitive verbs with third person object in (70) above: the denominal verb could be either transitive or intransitive.

(76) hupkčuuʕiċi
hupkču:-'i·c-'i·
dumpling-ingest-2SG.IMP
"Eat dumplings." (FW 468)

However, with the suffix *-ayi·* "give", the resulting verb is transitive, and it is with the recipient (i.e., the syntactic object) that the imperative agrees, not the DNV host.

(77) a. taanaqayi?is
ta:na-ayi·-'i·s
money-give-2SG>1SG.IMP
"Give me money." (FW 438)

b. taanaqayi?in
ta:na-ayi·-'in
money-give-2SG>1PL.IMP
"Give us money." (FW 440)

The sentences in (77) show that, unlike other denominal verbs, *-ayi·* verbs have a syntactic object, and that it corresponds not to the theme *taana* "money", but to the recipient, thus providing clear evidence that the DNV host phrase is not a syntactic object.

Denominal verbs pattern with intransitives with respect to imperative object marking, as they do with respect to passivization. The exception, *-ayi·* verbs, pattern as transitives, a fact due to the presence of a third semantic argument which, unlike the DNV host, maps to argument structure.

2.1.3 Conclusions

Two constructions in Nuu-chah-nulth can be used to examine the argument structure of a verb: the passive and the imperative. Only transitive verbs can passivize, because they have an object, i.e, the second item on their ARG-ST list, which can be promoted to subject in the passive. Imperatives indicate the person and number of both the subject and object on the verb, but third person objects are unmarked: transitive third person object imperatives take the same suffixes as intransitive verbs.

After looking at the behaviour of ordinary and denominal verbs with respect to passives and imperatives, we can say that denominal verbs pattern with intransitives, not with transitives. The exception, *-ayi·* "give", proves the rule; it patterns with transitives. This is due to the extra semantic role which is mapped to the object. The DNV host is never mapped to argument structure.

2.2 Semantics of DNVs

Koenig and Davis (2001) argue that the semantic structure of verbs contains two separate units: the situational core and the modal base. Their argument is based on the observation that there is an underlying similarity between verbs such as *have*, *get*, *lose*, *lack*, and *need* even though the entailments of each are different. They are all concerned with possession, but possession is not always an entailment. For example,while the verb *have* entails that something is possessed, the verb *need* entails that something is not possessed, but should be.

It is in order to account for both the similarities and differences between these verbs that Koenig and Davis propose to divide verbal semantics into a situational core, which contains semantic relations, and a modal base, which contains modal operators which act upon the semantic relations contained in the situational core.

The semantics of the verb *need* are as in (78). The situational core contains the possession semantic relation *have-rel*, and the modal base component contains a deontic modal base whose operand is the *have-rel*. The deontic modal entails that there is some background information which indicates what would ideally happen. In this case, the ideal is that something should be possessed.

(78) (Adapted from Koenig and Davis 2001, 93)

$$\begin{bmatrix} \textit{need-sem} & \\ \text{SIT-CORE} & \boxed{3}\begin{bmatrix} \textit{have-rel} & \\ \text{ACT} & \boxed{1} \\ \text{UND} & \boxed{2} \end{bmatrix} \\ \text{MODAL-BASE} & \left\langle \begin{bmatrix} \textit{deontic-mb} & \\ \text{SOA} & \boxed{3} \end{bmatrix} \right\rangle \end{bmatrix}$$

Johns (2003) notes that many of the DNVs in Eskimo-Aleut languages can be divided into classes whose members exhibit the same range of modal differences that are predicted by Koenig and Davis' semantic model.[4] The semantic similarity between DNV suffixes in Eskimo-Aleut and Nuu-chah-nulth suggests that Koenig and Davis' model may be relevant for Nuu-chah-nulth DNVs. In the next section I explore the range of semantics of DNVs in Nuu-chah-nulth and show that they represent a small number of semantic relations (i.e., situational cores), but a wide range of modal bases.

2.2.1 Semantics of Nuu-chah-nulth DNVs

The suffixes in (79) show a range of meanings associated with DNVs. I have divided them into groups which I believe relate to their situational cores, but I have not submitted them to any rigorous testing.

(79) a. **possession:** *-naˑk* "have", *-ʔaˑta* "need", *-ʼaˑp* "buy", *-ʔiƛ* "take", *-ʔiˑp* "get", *-ayiˑ* "give", *-ṕuːƛ* "receive (as payment for service/work)"

b. **consuming/making:** *-ʼiˑc* "eat/drink", *-iːɬ* "make", *-siːk* "finish making"

c. **perception:** *-ʼinaḱuːḥ* "see", *-ṅaːḥ* "look for", *-ʔiḥ/R/* "hunt/stalk", *-(y)uʔaːɬ* "find"

d. **comparison:** *-ḱuk/R/* "look like", *-ṕuq* "smell like", *-qatḥ* "act like"

e. **using:** *-ḥẃaɬ* "use", *-snaʔaːɬ* "deal with/play with", *-cawinyuk* "busy with"

f. **others:** *-simč* "pray for", *-cḥi* "marry", *-ɬuːɬa* "host (ceremony)"

[4] Johns also makes additional claims which I discuss in §3.3.2.

As I mentioned in §1.4.1, only the argument that is lowest on Bresnan and Kanerva's (1989) thematic hierarchy can be the DNV host. DNV hosts may never be agents, and so the other semantic argument in a DNV relation must necessarily be lower on the hierarchy. In a DNV formed with *-ayi·* "give", the host is the theme, rather than the recipient. In the model I discuss in the next section, the semantics of *-ayi·* is divided into two semantic relations, one of which is a possession relation. I do not have the answers to why no agents are allowed, or why so many suffixes are related to possession, but in the next section I discuss the use of sublexical modality, that is, modal operators acting within lexical semantics, as a means of accounting for the range of meaning involved with DNVs of possession.

2.2.1.1 Possession, Causation and the Inchoative

Consider the group of suffixes relating to possession. DNVs formed with the suffix *-na·k* "have" contain the basic possession relation, which is stative in nature. As we see in (80), there are two semantic arguments: a possessor (1SG) and a possessed (dog).

(80) ʕiniiƛ̓naks
ʕini:ƛ̓-na·k-s
dog-have-1SG
"I have a dog." (FW (354)

Ignoring the noun which is its stem, the semantics of the verb in (80) contains a semantic relation (i.e., that of possession) which is unmodified by a modal base. Thus, it will have the semantics shown in (81).

(81)
$$\begin{bmatrix} \textit{have-sem} & \\ \text{SIT-CORE} & \begin{bmatrix} \textit{have-rel} \\ \text{ACT} \quad \boxed{1} \\ \text{UND} \quad \boxed{2} \end{bmatrix} \\ \text{MODAL-BASE} & \textit{empty-list} \end{bmatrix}$$

The table in (82), adapted in part from Koenig and Davis (2001, 87), lists the set of five modal bases (in addition to the neutral), which Koenig and Davis discuss, as well as the English verbs which they claim exemplify the possession semantic relation. To this I add the Nuu-chah-nulth DNV suffixes which correspond to the same modal

bases.

(82)

	neutral	negative	irrealis		inchoative	inchoative-negative
			deontic	energetic		
Eng.	have	lack	need		receive	lose
Nuu. DNVs	-na·k "have"		-a·ta "need"		-ʔi·p "get"	

Note that I have omitted *-ayi·* "give", *-ʔiƛ* "take", and *-'a·p* "buy", and *-ṗu:ƛ* "receive (payment for work)" from the table in (82). I first address the suffix *-ayi·* "'give".

Koenig and Davis consider ditransitives like *give* and *send* to have a different situational core than those verbs listed in (82); *give* and *send* involve an additional causative relation. Because of its ditransitivity, I consider the situational core of DNVs constructed with *-ayi·* "give" to be in "cause to possess" class.

(83)
$$\begin{bmatrix} \textit{cause-possession-rel} & \\ \text{ACT} & \boxed{1} \\ \text{UND} & \boxed{2} \\ \text{SOA} & \begin{bmatrix} \text{SIT-CORE} & \begin{bmatrix} \textit{have-rel} & \\ \text{ACT} & \boxed{2} \\ \text{UND} & \boxed{3} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The other three suffixes *-ʔiƛ* "take", *-'a·p* "buy", and *-ṗu:ƛ* "receive (as payment for work)" fit with *-ʔi·p* "get" in that they all have inchoative aspect. Verbs formed with these suffixes all denote situations in which there is a change of state from not having to having. But *-ʔiƛ* "take" signals that the possessor has control over the change, while *-ʔi·p* does not. And also, *-'a·p* "buy" and *-ṗu:ƛ* "receive (as payment for work)" denote that a transaction took place, while *-ʔi·p* "get" and *-ʔiƛ* "take" do not.

(84) a. ʔaƛiips
ʔaƛa-ʔi·p-s
two-get-1SG
"I got two." (FW 374)

b. č'aaʔiƛʔiš
č'a:-ʔiƛ-ʔi·š
water-take-3.IND

"He or she took water." (FW 370)

c. maḥt̓iiʔapʔiš John
maḥt̓i:-'a·p-'i·š John
house-buy-3.IND John
"John bought a house." (FW 10)

d. ʔaƛqimɬp̓uuƛs
ʔaƛ-qimɬ-p̓u:ƛ-s
two-round-receive.as.payment-1SG
"I got paid two dollars." (FW 508)

For verbs like *buy* and *sell*, Koenig and Davis turn to Fillmore's (1977) analysis that transactional verbs contain four separate semantic relations. Fillmore observes that in a sentence like (85), the subject causes himself to gain a dozen roses and lose five dollars, while Harry causes himself to gain five dollars and lose a dozen roses.

(85) I bought a dozen roses from Harry for five dollars. (Fillmore 1977, 73)

Each transactional verb (e.g., *buy, sell, pay*, etc.) is connected with one of four semantic relations: X causes X to gain Z, X causes X to lose W, Y causes Y to gain W, and Y causes Y to lose Z.

Y c Z from X, Y causes X to have W, X receives W from Y.

If we assume that *-'a·p* "buy" has the four-part situational core of a transactional verb, then it would seem to fit in with *give* verbs, which involve a "cause to possess" relation. So would *-ʔiƛ* "take", which also involves the possessor being the causer of the possession, but without the additional situations involved in transactional verbs.

(86)
$$\begin{bmatrix} \textit{cause-possess-rel} & \\ \text{ACT} & \boxed{1} \\ \text{UND} & \boxed{2} \\ \text{SOA} & \begin{bmatrix} \textit{possess-rel} & \\ \text{ACT} & \boxed{2} \\ \text{UND} & \boxed{3} \end{bmatrix} \end{bmatrix}$$

While verbs formed with *-'a·p* "buy" focus on an individual gaining a tangible, non-monetary possession, the verbs formed with *-p̓u:ƛ* "receive (as payment for work)" focus on an individual gaining a (typically) monetary possession. It might

seem that the relation connected to *-ṕuːƛ̓* is that of a seller receiving payment, such as Harry receiving five dollars in (85) above. This is not the case because, as the gloss "receive (as payment for work)" suggests, the use of *-ṕuːƛ̓* is limited to situations where there is an exchange of labour or service for what is received in payment. The sentence in (87) represents the type of transaction that *-ṕuːƛ̓* is involved in. I cause myself to gain five dollars, but instead of losing something, I perform an action. Harry, on the other hand, loses five dollars, but does not gain anything, but the action I perform obviously benefits him.

(87) Harry paid me five dollars for mowing his lawn.

Thus, whereas transactions like *buy* and *sell* involve two agents who cause both a loss and a gain in possession for themselves, the transaction that *-ṕuːƛ̓* is connected to has only one pair of "cause to possess" and "cause to not possess" relations, but has additional relation in which the actor in the "cause to possess" relation is also an actor.

Under this framework, *-ʔaʕp* "buy", *-ṕuːƛ̓* "receive (as payment for work)", and *-ʔiƛ̓* "take" do not seem to form a natural class with *-ʔiʕp*. But notice that some modals in the English "cause to possess" verbs are really targeting the possession relation. Koenig and Davis use the verb *deny* as an example of a negative modal, but it is the *have-rel* which is negated, not the *cause-possession-rel*. In (88), adapted from Koenig and Davis (2001, 113), the state of affairs argument contains both a situational core and a modal base. The negative modal only has scope over the *have-rel*.

(88)
$$\left[\begin{array}{ll} \textit{cause-possession-rel} & \\ \text{ACT} & \boxed{1} \\ \text{UND} & \boxed{2} \\ \text{SOA} & \left[\begin{array}{ll} \text{SIT-CORE} & \boxed{4}\left[\begin{array}{ll} \textit{have-rel} & \\ \text{ACT} & \boxed{2} \\ \text{UND} & \boxed{3} \end{array}\right] \\ \text{MODAL-BASE} & \left\langle\left[\begin{array}{ll} \textit{neg-mb} & \\ \text{SOA} & \boxed{4} \end{array}\right]\right\rangle \end{array}\right] \end{array}\right]$$

Irrealis modals, on the other hand, apply to the entire *cause-possession-rel*. According to Koenig and Davis, the verb *promise* in (89) represents a situation where

Joan has not yet caused Bill to have $10, but when her promise is fulfilled, she will have.

(89) Joan promised Bill $10. (Koenig and Davis 2001, 101)

While Koenig and Davis consider English verbs like *give* to lack a modal, it may be the case that "cause to possess" verbs all involve an inchoative modal acting on a possession relation. Verbs like those created with *-'a·p* "buy", *-ṗu:λ* "receive (as payment for work)", and *-ʔiλ* "take" would all contain inchoative modal bases which apply to a *have-rel*, and form a natural class with *-ʔi·p* "get."

Some sublexical modals, such as irrealis, can apply to a causative relation, but others, such as the negative and perhaps the inchoative, only apply to the state of affairs which is caused; so in a verb like *deny*, it is the possession relation that is negated, not the causative relation. This area of Koenig and Davis' model needs to be further worked out.

DNVs connected to other semantic relations, such as perception, comparison, and the others in (79), present similar problems. For example, it is unlikely that the difference between *-ṗuq* "smell like" and *-qatḥ* "act like" can be reduced to difference in modal bases. But they do seem to form a natural class: all involve one argument resembling another in some way (i.e., by looks, smell, or action). DNVs formed from *-simč* "pray for", *-cḥi* "marry"[5] and *-ɬu;ɬa* "host (ceremony)" escape any sort of generalization. In these cases it would seem that unique situational cores are present.

2.2.1.2 Semantics of WH-questions and DVNs

Davis and Sawai (2001) show that the analysis Van Geenhoven (1996) proposes for WH-questions in West Greenlandic does not suit the data in Nuu-chah-nulth.

Van Geenhoven (1996, 1998a,b, 2002) treats incorporated nouns in West Greenlandic as predicates denoting a specific property, but not containing a variable. The variable is instead introduced with an existential quantifier, by the incorporating verb (i.e., DNV suffix). Van Geenhoven's semantics for incorporating verbs is given in (90). The variable P ranges over properties, and is introduced by the incorporated noun. An incorporated noun thus does not designate an individual, but rather a property which holds over an individual introduced by the verb. The semantics of incorporat-

[5]Perhaps *-cḥi* "marry" has an inchoative (or perhaps causative) possessional semantics with the additional stipulation that what is possessed is a spouse.

ing verbs given in (90) therefore mean that there exists some individual y such that in the world w, x verbs y and y has the property P.

(90) $\lambda P_{<s,<e,t>>} \lambda w_s \lambda x_e \exists y[\text{verb}_w(x, y) \wedge P_w(y)]$ (Van Geenhoven 1998b, 132)

Van Geenhoven claims that the WH-word in (92) involves existential quantifier operating on a property, and has a kind reading, not an individual reading. The question in (92) is "What kind of thing is it that you are eating?"

(91) $\lambda Q \lambda p \exists P[Q(P)(p) \wedge \text{kind}(P)]$

(92) Nuka su-tur-p-a?
Nuka.ABS what-drink/eat-INTER-[-TR]-3SG
"What did Nuka drink/eat?" (Van Geenhoven 1998b, 143)

Davis and Sawai argue that the kind reading required for *su* in West Greenlandic is not sufficient for Nuu-chah-nulth, which also allows individual readings of WH-questions. The answer to the question in (93) could be "that one" or "my copy of *Crime and Punishment*".

(93) waayaʕamiṯ Ray (puk)
which-buy-PAST-3SG.INT Ray (book)
"Which book did Ray buy?" (Davis and Sawai 2001, 134)

Davis and Sawai point out that all WH-words in Nuu-chah-nulth, including subject and object, obligatorily incorporate. When the main predicate is non-incorporating, auxilliary DNV suffixes are used (see (94) below). They argue that this is problematic for a Van Geenhoven approach in which the semantics of incorporation are handled by the verb itself.

(94) ʔaačačiɬiṯ kaapap John
who-AUX-PAST-3SG.INT like John
"Who does John like?" (Davis and Sawai 2001, 128)

As Davis and Sawai do not offer a solution to the problem of WH-question semantics in Nuu-chah-nulth, and it is beyond the scope of this thesis to offer such a solution, it remains an issue to be solved in future scholarship.

2.2.1.3 Summary

Many Nuu-chah-nulth DNVs share part of their semantics, their situational core. Many contain a *have-rel*, though some of these are causative as well. Differences

in the modal bases of DNVs account for some of the differences in meaning, but not all. Some difficulties might be removed if the nature of causative relations and inchoatives were resolved. However, some similar DNVs, such as the comparison set (*-ḱuk/R/* "look like", etc.), do not reduce to differences in modality.

The semantics of WH-questions lack a solution. Davis and Sawai (2001) argue that the semantics Van Geenhoven (1996) proposes for for West Greenlandic WH-word incorporation do not fit the data in Nuu-chah-nulth

The semantics of Nuu-chah-nulth as a whole, and of DNVs in particular is an under-studied field. As I discuss in §3.3.2, there are semantic similarities between Nuu-chah-nulth DNVs and those in Eskimo-Aleut languages. Linguists might gain much insight into the universals of language by exploring these issues further.

2.3 Linear Order and DNVs

The linear order of words plays a large part in the phenomenon of Nuu-chah-nulth DNVs. DNVs are constructed from phrases, rather than lexemes, and which words DNV suffixes attach to is determined by linear order. Also, the subject of a DNV can follow the entire phrase which contains the DNV suffix, or it can appear directly after the word which contains the suffix. In the next section I discuss what the parameters are in determining which word will contain the DNV suffix, and in §2.3.2 I look at the linear location of the subject.

2.3.1 Placement of DNV Suffixes

The agent is never the host, so if the theme[6] is an unmodified noun, it must be the host (setting aside the cases with *ʔu-* for the moment). In (95a), the theme *λišλiqy̓ak* "pants" is the host for the suffix *-ʔaˑta* "need". If *ḿaʔiλqac* "boy" is the host (as in (95b)), then the meaning is a nonsensical "The pair of pants needs a boy", not "The boy needs a pair of pants".

(95) a. ƛišƛiqy̓akʔataʔiš ḿaʔiƛqacʔi
ƛišƛiqy̓ak-ʔaˑta-ʔiš ḿaʔiƛqac-ʔiˑ
pants-need-3.IND boy-DEF
"The boy needs a pair of pants." (FW 334)

[6]While I am using the term "theme" here, I really mean "the most oblique non-agent role".

b. m̓aʔiƛqacʔataʔiš ƛišƛiqy̓ak
m̓aʔiƛqac-ʔa·ta-ʔiš ƛišƛiqy̓ak
boy-need-3.IND pants
"The pair of pants needs a boy" (FW 335)

The data in (95) might also be interpreted as showing that the participant role of the host is fixed. In other words, *-ʔa·ta* "need" can only attach to the thing that is needed, not the needer.

When the theme is modified, the modifier is the host. The host cannot be the noun, as (96) shows. The noun *λišλiqy̓akʔatas* "pants" cannot take the suffix *-ʔa·ta* "need" stranding the modifier *ċušuk* "new". The correct host-selection is shown in the sentence in (97).

(96) *ƛišƛiqy̓akʔatas ċušuk
ƛišƛiqy̓ak-ʔa·ta-s ċuš-uk
pants-need-1SG new-DUR
"I need a new pair of pants." (FW 300)

(97) ċušukʔatas ƛišƛiqy̓ak
ċuš-uk-ʔa·ta-s ƛišƛiqy̓ak
new-DUR-need-1SG pants
"I need a new pair of pants." (FW 133)

If there is more than one modifier, then the leftmost one is the host. This holds when the modifiers are all adjectives (99), and when one is a quantifier (98).

(98) ʔayuʔaaɬʔiš sačk č̓iima Kim
ʔaya-uʔa:ɬ-ʔiš sačk č̓i:ma Kim
many-find-3.IND sharp knife Kim
"Kim found a lot of sharp knives." (FW 328)

(99) sačkuʔaaɬʔiš ċušuk č̓iima Kim
sačk-uʔa:ɬ-ʔiš ċušuk č̓i:ma Kim
sharp-find-3.IND new knife Kim
"Kim found a sharp new knive." (FW 331)

When the theme of a DNV is a conjunction of nouns, the suffix appears only on the first one.[7]The suffix *-(y)uʔa:ɬ* "find" appears on *č̓i:ma* "knife", which is the

[7]It is interesting to note that this is the opposite of what happens in the Kyuquot dialect. Rose (1981) shows that in that dialect the two nouns must both be suffixed by the DNV suffix. Since the two dialects are otherwise in agreement with respect to the behaviour of DNV suffixes, I would argue that this difference is due to differences in the syntax of conjunctions.

first word of the conjunction *čiːma ʔuḥʔiːš kiːcy̓ak* "a knife and a spoon".

(100) a. čʼiimaquʔaaɬs ʔuḥʔiiš kiicy̓ak
čʼiːma-(y)uʔaːɬ-s ʔuḥʔiːš kiːcy̓ak
knife-find-1SG and spoon
"I found a knife and a spoon." (FW 44)

b. *čʼiimaquʔaaɬs ʔuḥʔiiš kiicy̓akuʔaaɬ
"I found a knife and a spoon (intended)." (FW 45)

To summarize, DNV suffixes attach to an unmodified noun, or, in case the noun is modified, to the first modifier of a noun (either quantifiers or adjectives). A distinct pattern emerges — DNV suffixes attach to the leftmost word in a nominal phrase.

(101)

		[N]
	[Adj]	N
	[Quan]	N
[Adj]	Adj	N
[Quan]	Adj	N
[N]	Conj	N

If we take any given situation which involves the event predication of a denominal verb, we can predict which word will be suffixed. For example, if there was a situation in which there was something that I needed and that something was a new pair of pants, then we know that we will find the suffix *-ʔaˑta* "need" on *ċušuk* "new" because of two facts: 1) DNV suffixes always appear on the first word of the noun phrase, and 2) modifiers always precede the noun.

As the data in (102) show[8], the only grammatical sentence is the one where: 1) the DNV suffix appears on the first word of the host phrase and 2) the modifier is the first word.

(102) a. ċušukʔatas ƛišƛiqy̓ak
ċuš-uk-ʔaˑta-s ƛišƛiqy̓ak
new-DUR-need-1SG pants
"I need a new pair of pants." (FW 133)

b. *ċušuk ƛišƛiqy̓akʔatas (FW 343)

c. *ƛišƛiqy̓akʔatas ċušuk (FW 300)

[8]Examples (102a) and (102c) have appeared above as (97) and (96) respectively.

d. *ƛišƛiqy̓ak c̓ušuk?atas (FW 344)

The nominal phrase in which a DNV suffix appears on the left-most member I will call the host phrase. I discuss the properties of this phrase in §2.4, but first I turn to the placement of the subject in sentences with a denominal verb.

2.3.2 Subject Placement

Perhaps the most interesting behaviour of DNVs is the positioning of the subject. In a sentence with a DNV, the subject can appear either after the entire DNV host phrase or directly after the first word, i.e., the verb. In (103a), *ʕiniiƛʔi* "the dog" appears inside the DNV host phrase, while in (2), repeated below as (103b), *ʕiniiƛʔi*, it appears following the host phrase.

(103) a. ʕič̓iicʔiš ʕiniiƛʔi c̓isqmis
ʕič-ʼi·c-ʔi·š ʕini:ƛ-ʔi· c̓isqmis
rotten-ingest-3.IND dog-DEF meat
"The dog is eating rotten meat." (FW 25)

b. ʕič̓iicʔiš c̓isqmis ʕiniiƛʔi
ʕič-ʼi·c-ʔi·š c̓isqmis ʕini:ƛ-ʔi·
rotten-ingest-3.IND meat dog-DEF
"The dog is eating rotten meat. (FW 24)

Recall that the basic word order in Nuu-chah-nulth is VSO. The sentence in (103a) seems to be obeying this word order, giving the outward appearance of a transitive verb followed by its subject and object. However, in (104) we can see that DNVs with adjective stems cannot passivize and therefore cannot be transitive. Thus, the sentence in (103a) cannot be VSO, since it has no object.

(104) *c̓ušukʔataʔantʔiš ƛišƛiqy̓ak
c̓uš-uk-ʔa·ta-ʼant-ʔiš ƛišƛiqy̓ak
new-DUR-need-PAST.PASS-3IND pants
"He needed a new pair of pants (intended)." (FW 390)

If (103a) is not VSO, then what is going on? The solution I propose in §2.5 is that the verb consists of two separate words, ʕič̓iicʔiš and c̓isqmis, and that the subject can appear between these two words. This is not so strange, because we could easily consider an English verb-particle construction whose meaning is not compositional from its parts, like *screw up*, as a single verb that consists of two separate words in

the syntax. Pronouns, such as the pronoun *it*, can appear "inside" the verb-particle cluster in *Cedric screwed it up*.

2.3.3 Summary

In this section, I have illustrated that DNV suffixes attach to the first word of a noun phrase, rather than the head of a phrase, and that the subject may appear inside this phrase. Next, I consider what kind of noun phrase DNV suffixes attach to.

2.4 The Domain of Affixation

While the nominal phrase which acts as a host for DNV suffixes appears to be a NP, here are several differences between ordinary syntactic NPs and host nominal phrases. NPs may be definite, but DNV host phrases cannot be (Wojdak 2003b). Possessed DNV host phrases and DNV host phrases with deictics, as well as simple definite DNV host phrases, are all disallowed. Cross-linguistically, such definiteness restrictions are common in noun incorporation; as Mithun (1984, 856) points out, it is quite common for incorporated nouns to be "unaccompanied by markers of definiteness or number, or by demonstratives." Wojdak suggests that the host is an NP while the ordinary syntactic phrase is a DP,[9] but it is also possible to account for the difference without reference to DPs.

In the remainder of this section I illustrate the difference between DNV host phrases and ordinary argument position NPs. First, I discuss possession (§2.4.1), then deictics (§2.4.2), and other definites (§2.4.3). Finally, I propose a simple method for accounting for this definiteness difference (§2.4.5).

2.4.1 Possession

Wojdak (2003b) points out that DNV hosts cannot be marked for possession. Of course, ordinary NPs can be possessed, as (105a) shows.[10] Here the noun *hupuk̓ʷas* "car" is possessed by *Kim*. But, when *hupuk̓ʷas* is in a host phrase it may not be

[9]More specifically, Wojdak (2003b) proposes that DNV suffixes are verbs in the syntax which subcategorize for NPs rather than DPs. However, this fails to account for the grammaticality of *ʔu-* verbs with definite objects. See §2.6 for discussion.

[10]Ideally, I would provide parallel examples with different verbs to exemplify my claims in each section, however at the present I have no such data.

possessed, as we see in (105b).

(105) a. **maakukʔiš** Sandy **hupuk̓ʷasukʔi** Kim
ma:kuk-ʔi·š Sandy hupuk̓ʷas-uk-ʔi· Kim
buy-3.IND Sandy car-POSS-DEF Kim
"Sandy bought Kim's car." (FW 414)

b. *hupuk̓ʷasukʔapʔiš Sandy Kim
hupuk̓ʷas-uk-'a·p-ʔi·š Sandy Kim
car-POSS-buy-3.IND Sandy Kim
"Sandy bought Kim's car (intended)." (FW 347)

2.4.2 Deictics

In addition to possessors, deictics are also forbidden in DNV host phrases, but allowed in syntactic NPs. The deictic *ḥaa* "that" is possible in (106a) where it is in an ordinary syntactic NP. Note that deictic requires the definite suffix *-ʔi·* on the noun *hupuk̓ʷas* "car". A deictic may not appear in a DNV host phrase, as (106b) shows.

(106) a. **maakukʔiš** Sandy **ḥaa** **hupuk̓ʷasʔi**
ma:kuk-ʔi·š Sandy ḥa: hupuk̓ʷas-ʔi·
buy-3.IND Sandy that car-DEF
"Sandy bought that car." (FW 419)

b. *ḥaaʔaapʔiš Sandy hupuk̓ʷasʔi
ḥa:-'a·p-ʔi·š Sandy hupuk̓ʷas-ʔi·
that-buy-3.IND Sandy car-DEF
"Sandy bought that car (intended)." (FW 421)

Because deictics always precede other modifiers they are always the first word of a nominal phrase. Therefore, one could argue that deictics cannot be hosts for DNV suffixes. However, since all definite nominal phrases are prohibited from being DNV host phrases, it is much more likely that it is definiteness which is the cause of ungrammaticality in sentences like (106b).

2.4.3 Definites

DNV hosts cannot be marked with the definite suffix *-ʔi·*, asWojdak (2003b) also notes. While an argument position NP can take *-ʔi·*, as in (107a), a DNV host

phrase cannot. The sentence in (107b) is ungrammatical because ***hupuk̓ʷas?i*** "the car" is definite.

(107) a. **maakuk?iš** Sandy **hupuk̓ʷas?i**
ma:kuk -?i·š Sandy **hupuk̓ʷas-?i·**
buy-3.IND Sandy car-DEF
"Sandy bought the car." (FW 424)

b. ***hupuk̓ʷas?i?ap?iš** Sandy
hupuk̓ʷas-?i·-'a·p-?i·š Sandy
car-DEF-buy-3.IND Sandy
"Sandy bought the car (intended)." (FW 425)

2.4.4 Proper Names

Definite NPs, possessed NPs, and NPs with deictics are all marked on the first word, with the definite suffix *-?i·* or the possessive suffix *-uk/-a·k* or both. As I discuss in §3.2, Wojdak (2003b) suggests that the presence of these nominal inflection suffixes is incompatible with DNV suffixes. However, proper names, which are definite by nature, are also not possible host phrases for DNV suffixes despite their lack of definite morphology.

(108) a. **?uyu?aaɬs** John
?u-(y)u?a:ɬ-s John
TRANS-find-1SG John
"I saw John." (FW 473)

b. ***John-u?aaɬs**
John-(y)u?a:ɬ-s
John-find-1SG
"I saw John (intended)." (FW 474)

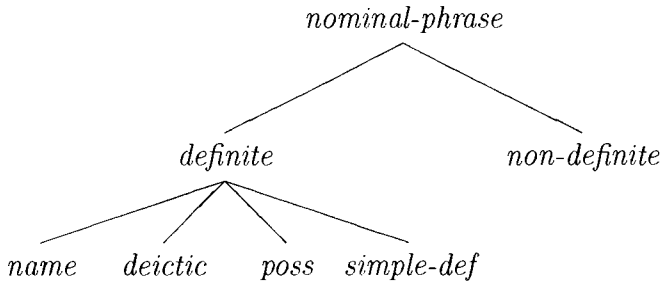
Wojdak treats the definite suffix as the head of DP, and suggests that DNV suffixes attach to NPs, not DPs (see §wojdak-sec for a more thorough discussion of Wojdak's analysis). However, if proper names are DPs, then Wojdak's solution correctly predicts that proper names are not possible hosts for DNV suffixes.

2.4.5 Summary and a Solution

I have shown that definite nominal phrases cannot be DNV host phrases. While ordinary syntactic NPs can be either definite or not, DNV host phrases cannot

be definite. The partial type hierarchy in (109) allows us to capture this distinction elegantly. Nominal phrases are divided into definite and non-definite, and there are three subtypes of definite nominal phrases: those with deictics, those with possessors, and those with neither.

(109)



The difference between syntactic NPs and DNV host phrases is as follows. An ordinary verb subcategorizes for a *nominal-phrase*, and so any of the subtypes can satisfy such a requirement. A DNV suffix can only have a *non-definite* nominal phrase as its host phrase, which is a typical constraint on incorporated nouns cross-linguistically.

2.5 A Linearization Approach in HPSG

In order to account for the fact that DNV suffixes always attach to the leftmost word of a noun phrase, I will make use of two developments in HPSG research; namely, constructions and word-order domains.

I propose that phrases can have morphological constraints on their individual words. This is similar to the theory of clitics argued for by Miller (1992) and Halpern (1995), where (at least some) clitics are lexical (i.e., word-level) affixes, as opposed to phrasal affixes (see Anderson 1992). Halpern argues for binary valued marking features which percolate along the edge of a phrase indicating that a feature has been marked morphologically. While this is plausible for inflection because the number of features is limited, it is not plausible for derivation. Rose (1981) lists 63 DNV suffixes out of a total of about 400 "lexical" derivational suffixes. Would only the DNV suffixes have corresponding marking features, or would all derivational suffixes have them? Fortunately there is another approach. The limitations marking features can be removed by making use of a more refined phrasal typology (see Sag 1997), in other words, constructions. I introduce an HPSG treatment of constructions in §2.5.1.

In order to account for the linear selection of a host, I make use of linear precedence constraints on word-order domains. Rather than relying on syntactic constituency and movement to determine the linear order of words, HPSG has used linear precedence constraints (Pollard and Sag 1987). This approach still relies entirely on syntactic constituency, a problem for languages like German, which can interleave members of separate syntactic constituents. The answer to this problem is word-order domains, which are used instead of syntactic constituents as targets of linear precedence constraints. In my treatment of DNV suffixes in Nuu-chah-nulth, I use the implementation of word-order domains Linearization Theory, which I introduce in §2.5.2.

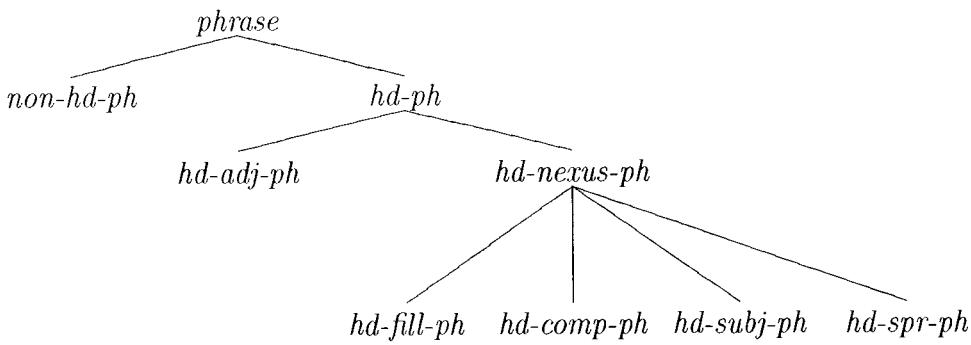
Using these tools and others I introduced in Chapter 1, I present an analysis of Nuu-chah-nulth DNVs in §2.5.3, where I show how the semantics of DNVs can be handled with Minimal Recursion Semantics, and how constructions and Linearization Theory can account for the interesting clitic-like selection of the DNV stem and the variation in word order exhibited by the subject.

2.5.1 Constructions

The lexicon is often considered to be the only component of grammar which contains irregularities in language, while the other components (syntax, morphology, phonology) are entirely regular. As the name "lexicon" suggests, irregularities should live in words, or lexemes. But sometimes the unit of irregularity is larger than individual words, including idioms such as *spill the beans* meaning "tell a secret" (Riehemann 2001), and sentences like *What's this fly doing in my soup?* meaning "Why is there a fly in my soup" (Kay and Fillmore 1999): the meanings of such utterances are not compositional assuming standard phrase structure. By allowing for phrases in the lexicon (or rather, as Koenig (1999) calls it, the constructicon), we can ascribe meaning to a phrase as a whole, overriding the standard semantic compositionality of headed phrases.

In HPSG, constructions are listed in the type hierarchy as subtypes of *phrase*, much as individual words or word classes are listed as subtypes of *word*, as illustrated by Sag's (1997, 439) phrasal hierarchy.

(110)



The immediate daughters of *phrase* are *non-headed-phrase* and *headed-phrase*, which is the mother of *head-adjunct-phrase* and *head-nexus-phrase*. *head-filler-phrase*, *head-complement-phrase*, *head-subject-phrase* and *head-specifier-phrase* are all subtypes of *head-nexus-phrase*.

One difference between the two types *head-adjunct-phrase* and *head-nexus-phrase* is the value of their semantics, and this is captured by means of constraints on the two phrase types. In particular, the list of semantics relations (LZT) of a *head-nexus-phrase* is identical to that of its head daughter, while the list of semantic relations of a *head-adjunct-phrase* is the union of that of its head and non-head daughters.

(111) a.
$$\left[\begin{array}{l} \textit{head-nexus-phrase} \\ \text{CONTENT} \mid \text{LZT} \quad \boxed{1} \\ \text{DTRS} \mid \text{HEAD-DTR} \quad \left[\text{CONTENT} \mid \text{LZT} \quad \boxed{1}\right] \end{array}\right]$$

b.
$$\left[\begin{array}{l} \textit{head-adjunct-phrase} \\ \text{CONTENT} \mid \text{LZT} \quad \boxed{1} \cup \boxed{2} \\ \text{DTRS} \quad \left[\begin{array}{l} \text{HEAD-DTR} \quad \left[\text{CONTENT} \mid \text{LZT} \quad \boxed{1}\right] \\ \text{NON-HEAD-DTRS} \quad \left\langle\left[\text{CONTENT} \mid \text{LZT} \quad \boxed{2}\right]\right\rangle \end{array}\right] \end{array}\right]$$

All subtypes of *head-nexus-phrase* listed in (110) inherit the constraint in (111a) and add their own constraints which distinguish them from each other. For example, a *head-complement-phrase* has a non-head daughter that corresponds to the argument on its head daughter's COMPS list, and a *head-subject-phrase* has one that corresponds to the argument on its head daughter's SUBJ list.

(112) a.
$$\left[\textit{head-complement-phrase}\ \left[\text{DTRS}\ \left[\begin{array}{l}\text{HEAD-DTR}\ \left[\text{SYNSEM}\,|\,\text{VALENCE}\,|\,\text{COMPS}\ \left\langle \boxed{1} \right\rangle\right] \\ \text{NON-HEAD-DTRS}\ \left\langle \left[\text{SYNSEM}\ \boxed{1}\right] \right\rangle\end{array}\right]\right]\right]$$

b.
$$\left[\textit{head-subject-phrase}\ \left[\text{DTRS}\ \left[\begin{array}{l}\text{HEAD-DTR}\ \left[\text{SYNSEM}\,|\,\text{VALENCE}\,|\,\text{SUBJ}\ \left\langle \boxed{1} \right\rangle\right] \\ \text{NON-HEAD-DTRS}\ \left\langle \left[\text{SYNSEM}\ \boxed{1}\right] \right\rangle\end{array}\right]\right]\right]$$

The constraints listed in (111) and (112) can only be expressed in reference to phrases. This is the basis for constructions; phrases parallel lexical items in belonging to a hierarchy of types.

2.5.2 Linearization Theory

The linear selection of the stem of a DNV suffix is the key to any proper treatment of DNVs in Nuu-chah-nulth. To this end, I use Linearization Theory, which has been developed in HPSG. Word-order domains are a central feature in this theory, and I describe them and their use with linear precedence constraints in §2.5.2.1. A more recent innovation in Linearization Theory is the use of topological fields, which have a history in German linguistics. I introduce these in §2.5.2.2.

2.5.2.1 Word-order Domains

An important issue in syntax is the relative ordering of words/constituents. How, for instance, do we ensure that subjects precede VPs in English? One solution is the use of linear precedence (LP) constraints in addition to the phrasal component of the grammar (Sag 1987). A constraint like that in (113) will ensure that subjects will always precede the verb phrase (which has already emptied its complements list).

(113) NP $\prec$ VP[COMPS *empty-list*]

One might still ask "to what do LP constraints apply?" They cannot simply apply to the phonological feature, since they would not have access to relevant syntactic information, such as whether it is an NP or a VP. Reape (1993) adds another feature to

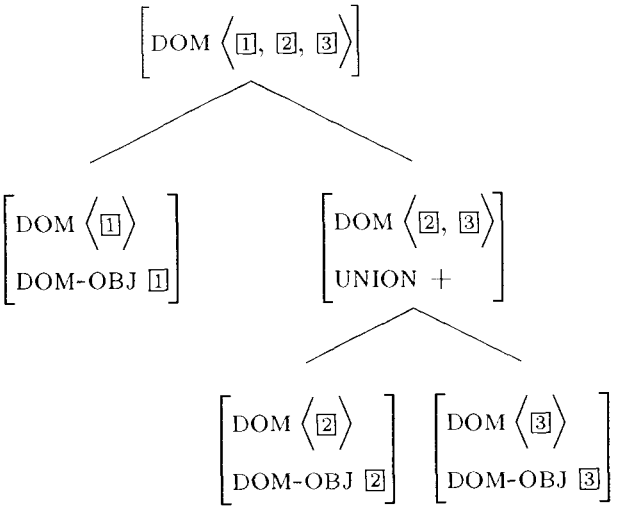
signs to handle linear ordering: the word-order domain (DOM). DOM is a list-valued feature which contains signs (i.e., phrases or words), or following Kathol (2000), domain objects — signs without DOM features.[11] The DOM-OBJ of a sign groups together the PHON and SYNSEM features; a word's DOM list contains its own DOM-OBJ. In order to allow for the degree of word-order freedom that is possible in natural languages, a mother's DOM is composed of the items on its daughters' DOMs in no particular order; ordering is accomplished strictly through LP constraints. The actual phonological value is the concatenation of the phonological values of the items on its DOM list from left to right.

(114)
$$\begin{bmatrix} \text{PHON} & \boxed{1} \oplus \boxed{2} \oplus \boxed{3} \\ \text{DOM} & \left\langle \left[\text{PHON } \boxed{1}\right], \left[\text{PHON } \boxed{2}\right], \left[\text{PHON } \boxed{3}\right] \right\rangle \end{bmatrix}$$

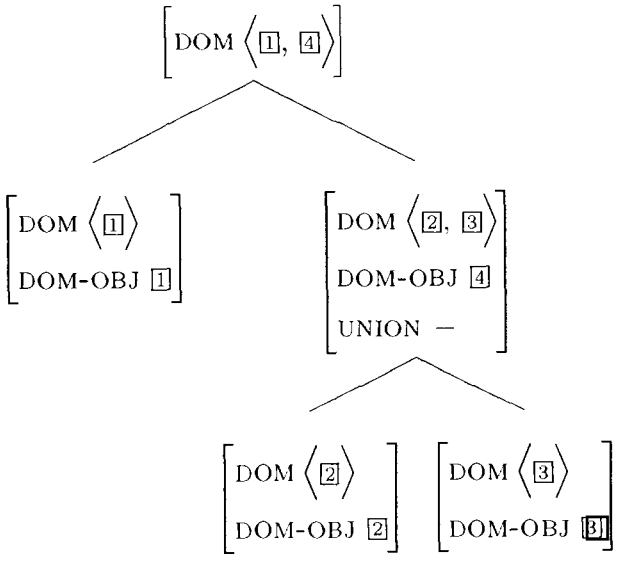
Often there are certain phrases which cannot be broken up (e.g., noun phrases in English), and Reape accommodates these by providing a binary feature, UNION. So if a noun phrase in a language was always a phonological unit, a constraint on the type *noun-phrase* would include [UNION −], preventing it from being interleaved with other constituents. The entire DOM list of such a phrase appears on its mother's DOM list. This is illustrated in (115) below. In (115a), the phrasal daughter is marked as [UNION +] and the members of its DOM list appear on its mother's. In (115b), the phrasal daughter is marked [UNION −] and so its domain object, shows up on its mother's DOM list.

[11] Kathol (2000, 99) raises the question of "whether domain elements are ever ordered according to the domains inside of them." Presuming that there are no languages which do this, Kathol strips the DOM feature out of the domain objects.

(115) a.



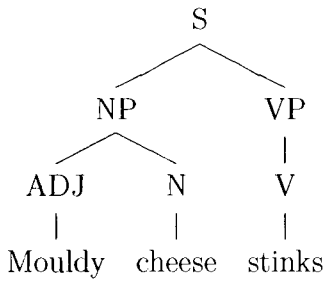
b.



Making a distinction between domains which undergo union and those that do not is crucial because, while the order of elements on the DOM lists are listed in a standard order, this does not need to be the case. Assuming that the word order of the lower phrase in (115a) is fixed in the order shown, the word order of the top-level phrase could also be ⟨ 2, 1, 3 ⟩ or ⟨ 2, 3, 1 ⟩. In (115b), however, 1 can never appear between 2 and 3, since all three never appear in the same word-order domain together.

To make the use of word-order domains more concrete, consider the sentence *Mouldy cheese stinks*, which has the structure in (116).

(116)



Each of the words in (116) has one domain object on its DOM. This domain object corresponds to the word itself. The DOM of the NP will contain the domain objects of both its daughters, but the order is fixed. In a NP, modifiers generally precede the noun, and so an LP constraint to this effect must be posited. The LP constraint in (117) states that a domain object that modifies a nominal must precede the domain object that it modifies.

(117) $\left[\text{SYNSEM} \mid \text{HEAD} \mid \text{MOD} \quad \boxed{1}\right] \prec \left[\text{SYNSEM} \quad \boxed{1}\left[\text{HEAD} \quad \textit{noun}\right]\right]$

The NP and its daughters will have the DOM values in (118). The modifier *mouldy* has the synsem of the noun as the value of its MOD feature, and so the constraint in (117) applies to the domain of the NP, and the domain object of *mouldy* precedes that of *cheese* in the NP's DOM. The PHON value of the NP is then *mouldy cheese* rather than *cheese mouldy*.

(118)

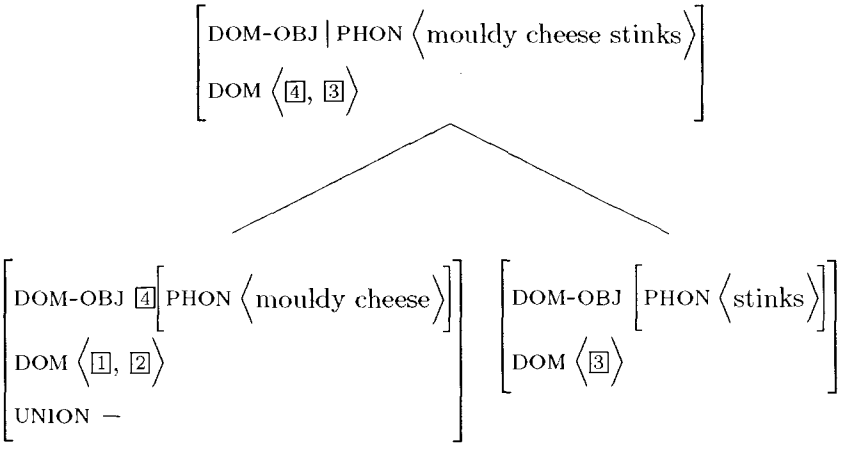
$$\left[\begin{array}{l}\text{DOM-OBJ}\ \left[\text{PHON}\ \langle \text{mouldy cheese} \rangle\right] \\ \text{DOM}\ \langle \boxed{1}, \boxed{2} \rangle\end{array}\right]$$

$$\left[\begin{array}{l}\text{DOM-OBJ}\ \boxed{1}\left[\begin{array}{l}\text{PHON}\ \langle \text{mouldy} \rangle \\ \text{SYNSEM} \mid \text{HEAD} \mid \text{MOD}\ \boxed{3}\end{array}\right] \\ \text{DOM}\ \langle \boxed{1} \rangle\end{array}\right] \quad \left[\begin{array}{l}\text{DOM-OBJ}\ \boxed{2}\left[\begin{array}{l}\text{PHON}\ \langle \text{cheese} \rangle \\ \text{SYNSEM}\ \boxed{3}\left[\text{HEAD}\ \textit{noun}\right]\end{array}\right] \\ \text{DOM}\ \langle \boxed{2} \rangle\end{array}\right]$$

Like the other words, the verb *stinks* has only its own domain object on its DOM list. This will pass straight up to the VP since the verb is its only daughter.

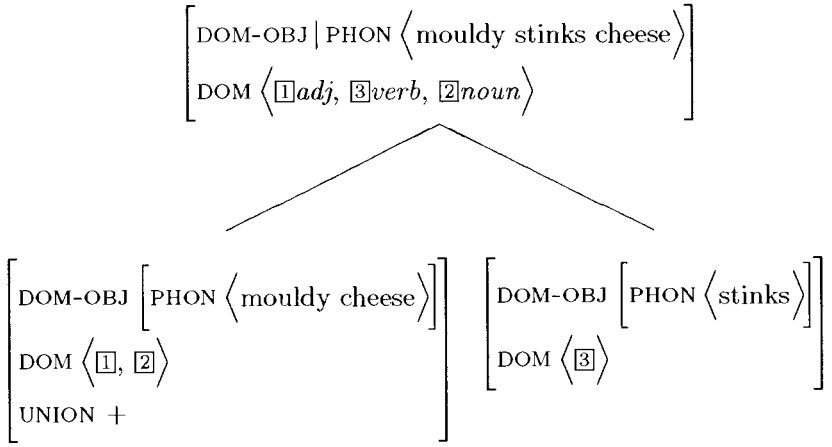
When it comes to the S, we can see what the UNION feature can do. English NPs act as a single unit, other words cannot appear linearly within an NP. Therefore, NPs in English have negative UNION values. The NP *mouldy cheese* will contribute its own domain object to the DOM of S, rather than those of its daughters. Assuming there is a LP constraint which orders subjects before VPs, the DOM of S will be as in (119). The subject's domain object, which has the PHON value *mouldy cheese*, is ordered before that of the verb phrase on the DOM list of S, and so the PHON value of the entire sentence is *mouldy cheese stinks*.

(119)



English does not allow positive values for UNION features, but other languages do. For the sake of simplicity, let us imagine a hypothetical language, Lisheng, which is identical to English except that verbs appear inside the subject NP between the modifier and noun. A typical Lisheng sentence would be *Mouldy stinks cheese*. Lisheng's NPs will be [UNION +], and the two members of its DOM list would be on the S's DOM list along with the verb. Lisheng would also have LP constraints that say, for example, that verbs precede nouns, but follow adjectives. The feature structure of the S would be as in (120). The adjective *mouldy* would be the first item on the S's DOM list, the verb *stinks* would be second, and the noun *cheese* would be last. The PHON value of the sentence would be *mouldy cheese stinks*, a perfectly grammatical sentence in Lisheng.

(120)



To summarize, Linearization Theory proposes that all signs have a word-order domain (DOM), a list which contains domain objects in an order that must obey any LP constraints. Phrasal daughters can contribute either the members of its DOM list or its own domain object to the DOM of its mother. A binary-valued feature UNION determines which option a given phrase will take: a phrase with a positive UNION feature contributes the members of its DOM, one with a negative UNION contributes its own domain object.

Having shown how word order domains and domain objects work to determine the linear order of words and constituents in a sentence, I next discuss a further refinement of Linearization Theory, topological fields.

2.5.2.2 Topological Fields

In addition to word-order domains, I will make use of topological fields in order to handle the word order in Nuu-chah-nulth. Kathol (2000), who employs topological fields (as well as word-order domains) in his analysis of German word order, states that the origin of topological fields (or *Stellungsfeld*) have a long history in the study of the German language. With their introduction into HPSG, topological fields have now been used in describing other languages, such as European Portuguese (Crysmann 2002)

Topological fields are much like slots in a template, but the slots can have any number of members, including zero, or they can be specified as containing at most one member. Thus, in Kathol's (2000) analysis of German, the sentence is broken up

into five fields, as shown in (121) below[12].

(121)

	vf	*cf*	*mf*	*vc*	*nf*
a.	Lisa	gießt	die Blume		
	Lisa	waters	the flower		
b.		welche Blume	Lisa	gießen würde	
		which flower	Lisa	water would	

Topological fields do not represent any form of syntactic constituency; they only deal with linear precedence. Thus, the subject, *Lisa*, appears in *vf*[13] in (121a), it appears in *mf* in (121c).

Every domain object is a subtype of *topo*, i.e., either *vf*, *cf*, *mf*, *vc*, or *nf*, and their relative ordering on a DOM list is handled by a set of LP constraints on these types.

(122) Topological LP Statement (Kathol 2000, 79)
$vf \prec cf \prec mf \prec vc \prec nf$

In the DOM for the phrase *daß Lisa die Blume sieht* "that Lisa saw the flower" in (123), each domain object is typed as one of the *topo* subtypes (I address how these are assigned below), and their order is fixed based on the LP rule in (122) above. The two *mf* domain objects are ordered by their case features.

(123)
$$\left[\text{DOM}\left\langle\left[\begin{array}{l}cf\\ \text{PHON}\left\langle daß\right\rangle\\ \text{COMPL}\end{array}\right],\left[\begin{array}{l}mf\\ \text{PHON}\left\langle Lisa\right\rangle\\ \text{NP[NOM]}\end{array}\right],\left[\begin{array}{l}mf\\ \text{PHON}\left\langle die\ Blume\right\rangle\\ \text{NP[ACC]}\end{array}\right],\left[\begin{array}{l}vc\\ \text{PHON}\left\langle sieht\right\rangle\\ \text{V[FIN]}\end{array}\right]\right\rangle\right]$$

Kathol sets up a hierarchy of *topo* subtypes in order to capture certain generalities. We saw in (121) that German verbs can appear in either *vc* or *cf*, and so Kathol introduces an intermediary subtype, *verbal*, which has *vc* and *cf* as subtypes. The domain objects of all verbs, then, are of type *verbal*. This is the HPSG equivalent to underspecification. Subordinate phrases like (121c), *daß Lisa die Blume gießen*

[12]The table in (121) is, much like Frankenstein's monster, stitched together from bits and pieces of various tables in Kathol's (2000) chapter 4, but with the field names he gives in chapter 5.

[13]The names of the fields are not exactly abbreviations, but rather somewhat mnemonic labels. For example, while *vf* is the *vorfeld* "pre-field", *cf* is the *linke Satzklammer* "left sentence bracket", but it is where complementizers appear. Since Nuu-chah-nulth topology differs greatly from that of German, I will introduce a new set, and so I will not go into the meanings of Kathol's labels. For those who are interested, they are listed on p. 78 of Kathol 2000.

würde morgen abend, must have a complementizer in *cf*, which can have only one *cf* domain object, so the domain objects of the verbs *gießen* "water" and *würde* "would" must be of type *vc*. Kathol uses constructions to do this, using constraints on specific types of phrases. He divides all finite clauses into three categories: verb-initial (*v-1*), verb-second (*v-2*), and subordinate (*subord*). Each of these types has constraints on the members of its DOM, and so a *subord* clause must have a *cf* complementizer, while a *v-2* clause must not have any *cf* domain object on its DOM list.

In the next section I will propose a set of topological fields appropriate for Nuu-chah-nulth and present an analysis of DNV sentences, relying on constructions and Linearization Theory as described above.

2.5.3 DNVs and their Host Phrases

In §2.5.3.1, I explain how the semantics of the DNV combine with the semantics of the host phrase. Then, in §2.5.3.2, I describe how the DNV suffix ends up on the first word of the host phrase, and how I handle a noun phrase becoming a verb.

2.5.3.1 Semantics

The semantics of a DNV-marked noun phrase can be represented in Minimal Recursion Semantics (MRS) in a straightforward manner. The semantic relation of the DNV can be introduced in the word which contains the DNV suffix, and the Semantics Principle will carry it to the phrase level.

The sentence in (99), repeated below as (124), contains a denominal verb with the suffix *-(y)uʔaːɬ* "find". The host phrase is *sačk ċušuk čʼiima* "sharp new knife" and the stem is *sačk* "sharp". There is one syntactic argument, *Kim*, which is the subject.

(124) sačkuʔaaɬʔiš ċušuk čʼiima Kim
sačk-(y)uʔaːɬ-ʔiːš ċuš-uk čʼiːma Kim
sharp-find-3.IND new-DUR knife Kim
"Kim found a new sharp knife." (FW 331)

The semantics of an ordinary noun phrase like "sharp new knife" can be represented as in (125).[14] The referent is sharp, it is new, and it is a knife.

[14] I am omitting much of the "bookkeeping" features of MRS, such as the handles for readability.

(125)
$$\left[\text{CONT} \mid \text{LZT} \quad \left\{ \begin{bmatrix} \textit{sharp-rel} \\ \text{ARG} \quad \boxed{1} \end{bmatrix}, \begin{bmatrix} \textit{new-rel} \\ \text{ARG} \quad \boxed{1} \end{bmatrix}, \begin{bmatrix} \textit{knife-rel} \\ \text{ARG} \quad \boxed{1} \end{bmatrix} \right\}\right]$$

Each word contributes one predication on the referent, but the resulting noun phrase will contain all of these predications. Thus, the semantics of ***sačk*** "sharp", shown in (126), would contain only the *sharp-rel*, whose argument value is the index of the noun it modifies. The noun's index value, which is must end up as the value the modifier's semantic relation, is accessible through the feature MOD, which contains the modified noun's SYNSEM value.

(126)
$$\left[\begin{array}{ll} \text{PHON} & \langle \textbf{sačk} \rangle \\ \text{SYN} \mid \text{MOD} & \begin{bmatrix} \textit{noun-word} \\ \text{INDEX} \quad \boxed{1} \end{bmatrix} \\ \text{CONT} \mid \text{LZT} & \left\{ \begin{bmatrix} \textit{sharp-rel} \\ \text{ARG} \quad \boxed{1} \end{bmatrix} \right\} \end{array}\right]$$

Now, I turn to the semantics of a DNV phrase. When the suffix ***-(y)u?a:ɬ*** "find" is attached to ***sačk*** "sharp", another semantic relation is added to the relation of the stem, as in (127). The value of the UND feature is the value of the argument of the original relation, which is in this case *sharp-rel*.

(127)
$$\left[\begin{array}{ll} \text{PHON} & \langle \textbf{sačku?aaɬ} \rangle \\ \text{SYN} \mid \text{MOD} & \begin{bmatrix} \textit{noun-word} \\ \text{INDEX} \quad \boxed{1} \end{bmatrix} \\ \text{CONT} \mid \text{LZT} & \left\{ \begin{bmatrix} \textit{sharp-rel} \\ \text{ARG} \quad \boxed{1} \end{bmatrix}, \begin{bmatrix} \textit{find-rel} \\ \text{ACT} \quad \boxed{2} \\ \text{UND} \quad \boxed{1} \end{bmatrix} \right\} \end{array}\right]$$

The semantics of ***sačku?aaɬ?iš ċušuk čiima*** "find a sharp new knife" will contain all the semantic relations of the host phrase plus the DNV relation *find-rel*. I make the assumption that phrases consisting of a noun and their modifiers are binary-branching, so that the phrase ***sačk ċušuk čiima***, and therefore also ***sačku?aaɬ?iš ċušuk čiima***, would be as in Figure 2.1 on page 68. I am setting aside the issue of word order, as I address it in the following section. The semantic relations of the

head daughter, *čiima* "knife", and the modifier daughters are all added together in the phrasal node itself.

Now that we have a way for the semantics of a DNV phrase to work out, I turn to the issue of which word contains the DNV suffix.

2.5.3.2 Clitic-like Behaviour

In derivational terms, the input to a DNV morphological rule is a phrase, and since there is a phonological change involved — suffixation — there are two options: only the host word itself is input for suffixation, or the entire phrase serves as input for the suffixation. The latter approach must contend with the problem of locating the suffix properly, since it is not on the last word of the phrase but the first, and thus inside. These two approaches are identical to those proposed for analyzing clitics. Anderson (1992, 1993) proposes that clitics are affixes which take entire phrases as stems. A suffix on the first word (i.e., a second position clitic) of a phrase is equivalent to an infix which comes after the first onset or syllable of a word. Miller (1992) and Halpern (1995) support the view that clitics are attached to a word on the edge of a phrase in order to phonologically mark a feature that is a property of the entire phrase. The difference between these two approaches is the input to affixation.

In a non-derivational grammar like HPSG, it is critical to have a method for preventing stems from appearing as full words in the syntax. While *ċuš-* "new" is a stem, it is not a word. It can only appear as a word if it has been suffixed by, for example, *-uk* "DUR" giving *ċušuk*. Some DNV suffixes attach only to *ċuš-*, while others can attach to *ċušuk*. The suffix *-'a·p* "buy" can only attach to the stem *ċuš-*.

(128) ċušaapʔiš Sandy ƛuɬ hupuk̓ʷas
ċuš-'a·p-ʔi·š Sandy ƛuɬ hupuk̓ʷas
new-buy-3.IND Sandy nice car
"Sandy bought a nice new car." (FW 431)

By making use of types we can prevent *ċuš-* from appearing as a word. Only a *word* or a *phrase* can be the daughter of a phrase, as shown in (129), but a *lexeme* can only be a stem in a morphologically complex word, as in (130).

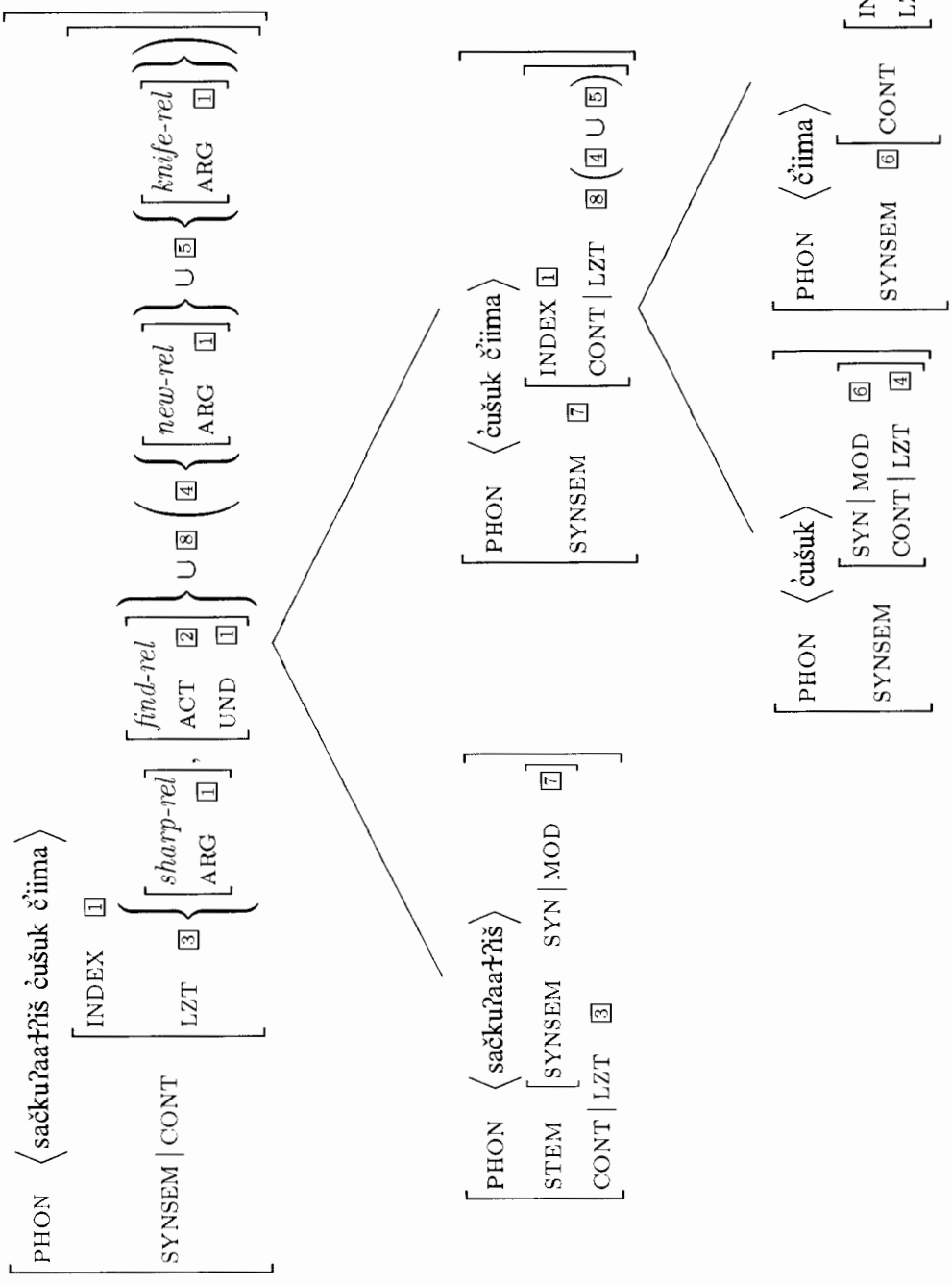
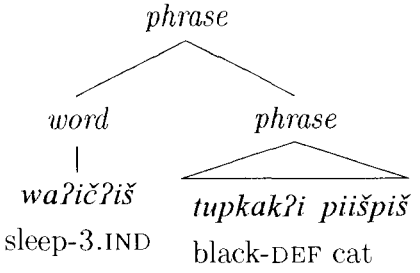


Figure 2.1: DNV-marked noun phrase

(129)



"The black cat is sleeping." (FW 472)

(130) $\begin{bmatrix} word & \\ \text{STEM} & [lexeme] \end{bmatrix}$

The phrase which must be input for DNV suffixation in (128) contains a non-word (i.e., lexeme) stem, *ċuš* "new". For this stem to become a full-fledged word, it must be suffixed by, for example, *-uk* "durative". Thus, the phrase ***ċuš ƛuɬ hupuǩʷas*** "new nice car" is not possible as an ordinary noun phrase, even though it is correct input for DNV suffixation.

(131) *maakuk?iš Sandy ċuš ƛuɬ hupuǩʷas
maakuk-?iš Sandy ċuš ƛuɬ hupuǩʷas
buy-3.IND Sandy new nice car
"Sandy bought a new nice car (intended)." (FW 470)

If we were to assume Anderson's view of clitics, we would need to redefine phrases in such a way that they would be able to contain lexemes as well as words. But the only lexeme allowed is the one which will be suffixed with a phrasal affix. If we allow lexemes in phrases, how can we ensure that only a lexeme that eventually become a word by phrasal affixation is permitted?

A better approach is that of Miller and Halpern, where the phrase selects a word which has been already been suffixed. Instead of using FIRST and LAST features to percolate along the edges of a phrase, we can use DOM. Phrases which contain a word with a DNV suffix are of the type *dnv-marked-noun-phrase*, and words which contain DNV suffixes are of the type *dnv-marked-word*.

The important constraints on the type *dnv-marked-word* are given in (132) below. Its PHON value is a function f of the PHON value of its stem that attaches the

suffix and performs any additional morphology. The domain object of this word is *verb-f*, which

(132)
$$\begin{bmatrix} \textit{dnv-marked-word} \\ \text{PHON} \quad \boxed{1}f(\boxed{2}) \\ \text{DOM} \quad \left\langle \begin{bmatrix} \textit{verb-f} \\ \text{PHON} \quad \boxed{1} \end{bmatrix} \right\rangle \\ \text{STEM} \quad \begin{bmatrix} \text{PHON} \quad \boxed{2} \end{bmatrix} \\ \text{CONT} \mid \text{LZT} \quad \left\{ \begin{bmatrix} \textit{dnv-rel} \end{bmatrix} \right\} \end{bmatrix}$$

(133)
$$\begin{bmatrix} \textit{dnv-marked-noun-phrase} \\ \text{DOM} \quad \left\langle \begin{bmatrix} \text{CONT} \mid \text{LZT} \quad \left\{ \begin{bmatrix} \textit{dnv-rel} \end{bmatrix} \right\} \end{bmatrix} \right\rangle \oplus \textit{list}(\textit{dom-obj}) \end{bmatrix}$$

The partial feature structures of the relevant phrase and word types are given in (133) below.

In (133), the first domain object in the DNV phrase must include a *dnv-rel* in its semantics. Since the phrase's DOM list is made by shuffling the DOM lists of its daughters, this will require one of its daughters, namely the first, to be a *dnv-marked-word*.

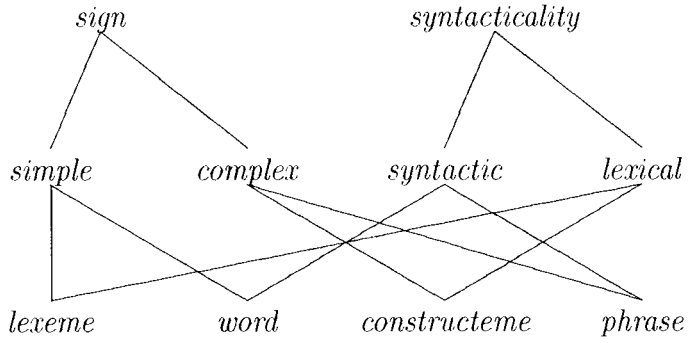
The effect is similar to Halpern's (1995) marking features, but, since each morphologically complex word is specifically typed, my approach does not require any new features. What is required is a more fine-grained type hierarchy for domain objects, which I will discuss in §2.5.3.3.

The phrase which we get from (133) is not yet verbal — it is a noun phrase with the restriction that the first word contains a DNV. This kind of noun phrase cannot appear as an ordinary NP, since the first word is essentially a verb. So we have a noun phrase which cannot appear as a noun phrase in the syntax just as we have words (lexemes) that cannot appear as words in the syntax. In order to differentiate the two types of phrases, I propose a "constructeme", which is available to morphology, but not to syntax. Constructemes share many constraints with phrases (for example, they have DAUGHTER features) but cannot be daughters themselves. Items that have been described in the literature as constructions, such as idioms, may be stored as

constructemes in the lexicon , but their actual syntactic realizations would still be phrases.

The four kinds of sign — lexemes and words, constructemes and phrases — can be divided along two dimensions: simple vs. complex and syntactic vs. lexical. Words and lexemes are simple signs, but phrases and constructemes, having daughters, are complex signs. Words and phrases are syntactic objects, while lexemes and constructemes live only in the lexicon.

(134)



In a derivational sense, we begin with a kind of noun phrase, a *dnv-marked-noun-phrase*, which is a constructeme — it cannot appear in a sentence as a noun phrase. The first word of this constructeme is a dnv-marked word and contains the DNV semantics. While this is a special kind of noun phrase, it is still a noun phrase, not a verb. We need another type, this time a subtype of *word*, which will have a *dnv-marked-noun-phrase* as its stem. The daughter features which distinguish a phrase from a word are discarded, but the PHON, SYNSEM (which contains SYN and CONT) and DOM features are carried over to the new word.

(135)
$$\begin{bmatrix} \textit{dnv-verb-word} & \\ \text{PHON} & \boxed{1} \\ \text{DOM} & \boxed{2} \\ \text{SYNSEM} & \boxed{3} \\ \text{STEM} & \begin{bmatrix} \textit{dnv-marked-noun-phrase} & \\ \text{PHON} & \boxed{1} \\ \text{DOM} & \boxed{2} \\ \text{SYNSEM} & \boxed{3} \\ \text{DTRS} & \textit{daughter-struc} \end{bmatrix} \end{bmatrix}$$

Because the DOM of the new word is the same as that of the stem phrase, the word appears to be a phrase on the surface.

(136)
$$\begin{bmatrix} \textit{dnv-verb-word} & \\ \text{DOM} & \boxed{2}\left\langle \left[\text{čuš?aap?iš} \right] \right\rangle \oplus \textit{list} \\ \text{STEM} & \left[\text{DOM} \quad \boxed{2} \right] \end{bmatrix}$$

What I have described above is a phrase becoming a word. This is not unheard of in languages; Clark and Clark (1979) show that in English, phrases can be the input for denominal verb formation. Consider, for instance, the denominal verbs listed in (137). English DNVs are zero-derived, so in (137a), the noun phrase *Bonny and Clyde* is the verb, while in (137b), the noun phrase *Fourth of July* is the verb, and is marked with past tense. The noun phrases are subject to the regular constraints on noun phrases, but they surface as verbs, just as we saw in Nuu-chah-nulth.

(137) a. to Bonny and Clyde one's way through the West (Clark and Clark 1979, 783)

b. We Fourth of July'd at Lake Tahoe. (Clark and Clark 1979, 802)

In Nuu-chah-nulth (and English), noun phrases can be the bases for DNV formation. The kind of noun phrase that can be a stem for this DNV formation is different from normal noun phrases in that it must include a DNV-marked word. Since this kind of noun phrase cannot appear as it is in an argument position in the syntax, it is a constructeme — it has no syntactic reality, but the constraints of phrasal syntax still apply.

Unlike English, Nuu-chah-nulth DNVs do not form tight phonological units; the subject of a DNV may appear after the first word, inside the DNV itself. In the next section I deal with the issue of word order, using the concept of topological fields.

2.5.3.3 Word Order of the Whole Sentence

As I illustrated in §2.3.2, the subject of a DNV may appear inside the host phrase, directly after the word with the DNV suffix. In (103a), repeated here as (138), the subject *ʕiniiƛʔi* "the dog" appears inside the DNV *ʕičiic ċisqmis* "eat rotten meat". While the sentence looks like it is VSO, it is not, since it has no object, as I showed in §2.3.2; *ċisqmis* "meat" is part of the verb.

(138) ʕičˀiicʔiš ʕiniiƛʔi ċisqmis
ʕič-ˀiːc-ʔiːš ʕiniːƛ-ʔiː ċisqmis
rotten-ingest-3.IND dog-DEF meat
"The dog is eating rotten meat." (FW 25)

Because the verb is a phrase at the lexical level, it also has the word-order domain of a phrase at that same level. In other words, *ʕičiic ċisqmis* "eat rotten meat" is a discontinuous contituent in (138).

In the sentences in (139), the subject and object can appear in either order.[15] There appears to be no difference in meaning between the two sentences, though this area of Nuu-chah-nulth grammar needs to be studied more deeply.

(139) a. sukʷiƛʔiš čakupʔi ciyapuxsʔi
su-ši(ƛ)-ʔiːš čakup-ʔi ciyapuxs-ʔi
take-MOM-3.IND man-DEF hat-DEF
"The man took the hat." (FW 305)

b. sukʷiƛʔiš ciyapuxsʔi čakupʔi
su-ši(ƛ)-ʔiːš ciyapuxs-ʔi čakup-ʔi
take-MOM-3.IND hat-DEF man-DEF
"The man took the hat." (FW 304)

[15]The default VSO order is only necessary when it would be unclear which argument is the agent. For example, if subject and object were both human, the subject must precede the object. However, context can also play a role, since it might clarify which is the agent. This is a complicated issue, and is outside the scope of this thesis. I address only the more usual sentences where it is clear which argument is the agent.

The free variation shown in (139) suggests that both arguments are in the same topological field, which I call the nominal field, or *nom-f*. The topological field that contains the verb is the verb field, or *verb-f*. The ordering of the two fields is handled by the LP constraint in (140a).

(140) a. *verb-f* ≺ *nom-f*

b.

verb-f	*nom-f*	
suk^{w}iƛʔiš	**čakupʔi**	**ciyapuxsʔi**
"take"	"the man"	"the hat"
suk^{w}iƛʔiš	**ciyapuxsʔi**	**čakupʔi**
"take"	"the hat"	"the man"

Now that we have identified the topological fields for Nuu-chah-nulth,[16] we need to determine how the fields are assigned.

Since all NPs appear in *nom-f*, we can specify that the domain object of an NP is of type *nom-f*, and since all verbs appear in *verb-f*, we can specify that the domain object of a verb is of type *verb-f*.

(141) a. $\begin{bmatrix} \textit{noun-phrase} & \\ \text{DOM-OBJ} & \textit{nom-f} \end{bmatrix}$

b. $\begin{bmatrix} \textit{verb-word} & \\ \text{DOM-OBJ} & \textit{verb-f} \end{bmatrix}$

In our example sentences (139), *suk^{w}iƛʔiš* "take" has a domain object of type *verb-f* by virtue of being a verb. Because *čakupʔi* "the man" and *ciyapuxsʔi* "the hat" are both NPs, their domain objects are of type *nom-f*. Without any LP constraints to the contrary, the subject may precede or follow the object.

We have an analysis of word order in an ordinary sentence, so I turn now to the word order of a DNV sentence. Consider the sentence in (142) below. The subject *Sandy* is inside the verb *ƛuɬʔaapʔiš ċušuk hupuḵ^{w}as* "buy a nice new car", which consists of more than one domain object.

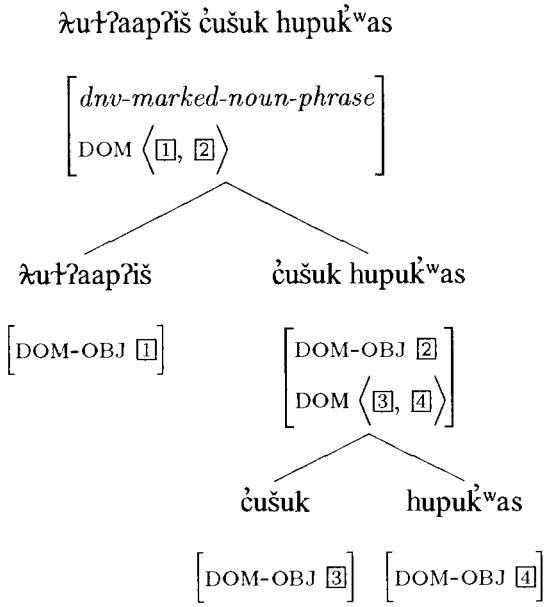
(142) ƛuɬʔaapʔiš Sandy ċušuk hupuḵ^{w}as
ƛuɬ-'a·p-ʔi·š Sandy ċuš-uk hupuḵ^{w}as
nice-buy-3.IND Sandy new-DUR car

[16]There are undoubtedly other topological fields, but the study of word order necessary to identify them is far beyond the scope of this thesis. The two fields I propose, *verb-f* and *nom-f*, are sufficient for the data given in this thesis.

"Sandy bought a nice new car." (FW 430)

We need to specify that part of the DNV belongs in *verb-f* and the rest belongs in *nom-f*. This can be done by marking the DNV as [UNION +], and allowing the members of its DOM list appear on the sentence's DOM. The entire DNV is a *dnv-verb-word*, but it inherits its DOM from the *dnv-marked-noun-phrase*. Assuming that all NPs are binary-branching, the DOM feature of a *dnv-marked-noun-phrase* would contain two items, as in (143).

(143)



What we need is for the first item on the DOM of a *dnv-marked-noun-phrase* to be of type *verb-f* and the second to be of type *nom-f*. Since the second item is already a kind of noun phrase (it is a phrase and is headed by a noun), it will be of type *nom-f* because of the noun phrase LP constraint in (141a). The first item, which is the domain object of a *dnv-marked-word*, is specified as *verb-f* by the constraint in (132). Thus, the constraint on *dnv-marked-noun-phrase*, first introduced in (133) above, will effectively be as in (144), where the first item is *verb-f*, and the remainder is *nom-f*.[17]

(144)
$$\left[\begin{array}{l} \textit{dnv-marked-noun-phrase} \\ \text{DOM} \quad \left\langle \left[\begin{array}{ll} \textit{verb-f} & \\ \text{CONT} \mid & \left\{\left[\textit{dnv-rel}\right]\right\} \end{array}\right] \right\rangle \oplus \text{list}(\textit{nom-f}) \\ \text{UNION} \quad \{\} \end{array}\right]$$

The DOM of the sentence in (142) will contain three items, two from the verb and one from the subject. The subject is shuffled in, and so can appear anywhere

[17]The constraint in (144), while compatible with all the constraints given, is more specific than necessary and so would not appear as such in the type hierarchy. What would appear is the original constraint in (133.

in the *nom-f* field, including the initial position, which causes it to be surrounded by the discontinuous parts of the DNV (145a), or the final position, following all of the DNV (145b).

(145) a.

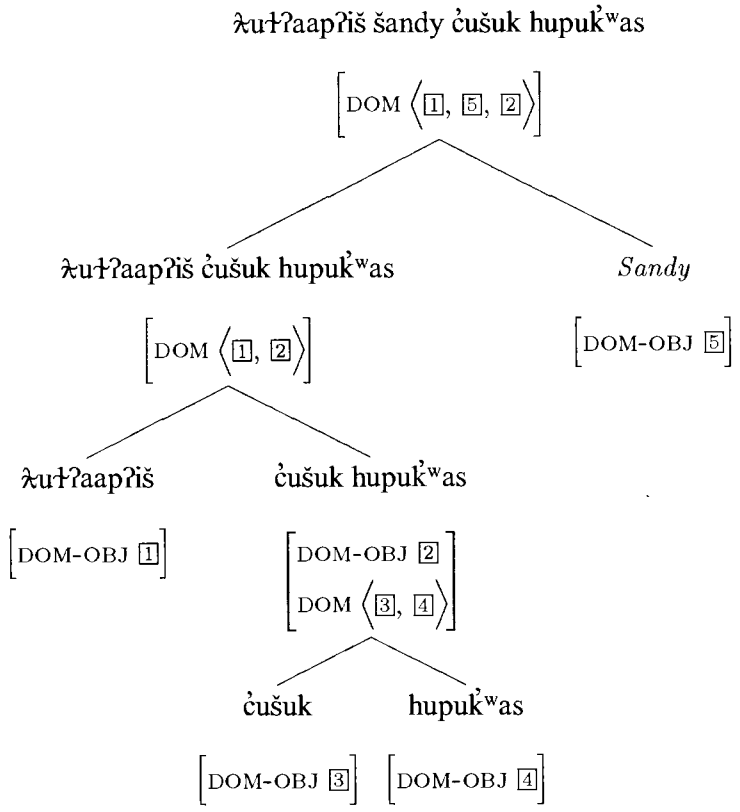
$$\left\langle \left[\begin{array}{l} \textit{verb-f} \\ \text{PHON} \left\langle \text{λuɬʔaapʔiš} \right\rangle \end{array} \right], \left[\begin{array}{l} \textit{nom-f} \\ \text{PHON} \left\langle \text{Sandy} \right\rangle \end{array} \right], \left[\begin{array}{l} \textit{nom-f} \\ \text{PHON} \left\langle \text{ċušuk hupuǩʷas} \right\rangle \end{array} \right] \right\rangle$$

b.

$$\left\langle \left[\begin{array}{l} \textit{verb-f} \\ \text{PHON} \left\langle \text{λuɬʔaapʔiš} \right\rangle \end{array} \right], \left[\begin{array}{l} \textit{nom-f} \\ \text{PHON} \left\langle \text{ċušuk hupuǩʷas} \right\rangle \end{array} \right], \left[\begin{array}{l} \textit{nom-f} \\ \text{PHON} \left\langle \text{Sandy} \right\rangle \end{array} \right] \right\rangle$$

The syntactic tree which corresponds to the sentence ***λuɬʔaapʔiš Sandy ċušuk hupuǩʷas*** "Sandy bought a nice new car" is given in (146). Strictly speaking, the syntactic structure of the DNV phrase is hidden in the STEM value of the *dnv-verb-word*, but I show it as part of the sentence here. The verb has two domain objects on its DOM list, and the domain object of the subject comes between them on the DOM list of the entire sentence.

(146)



2.5.4 Summary

In this section I have shown how the properties of Nuu-chah-nulth DNVs can be accounted for in HPSG, using constructions and Linearization Theory.

2.6 *ʔu-* and Other Grammatical Stems

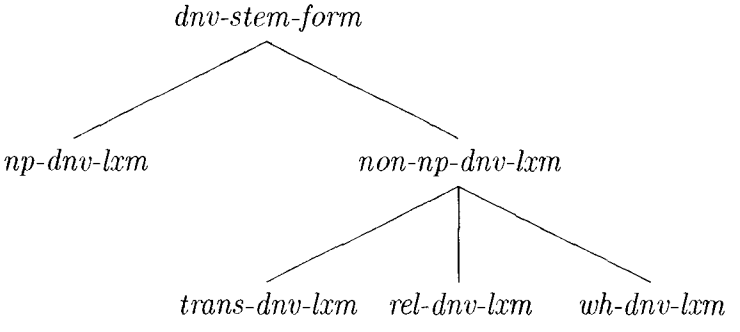
In Nuu-chah-nulth there is a set of stems that primarily serve a grammatical function. I list some of these stems in (147) below.

(147)

ʔu-	transitive
ʔača(q)-	who
ʔaqa-	what
wa:yaq-	which
yaq-	definite relative
qʷi-	indefinite relative

While these stems can be suffixed with a DNV suffix, they cannot be considered nouns (for reasons I discuss in the sections below), and therefore the type of lexeme they are part of must be different from the *dnv-suffixed-lexeme*. Since all DNV forms are suffixed, it might be more perspicuous to rename *dnv-suffixed-lexeme* to *np-dnv-lexeme* to show that its stem is part of a NP. Grouping DNVs with the stems in *bound-stem-list* together under the *non-np-dnv-lxm* type, we now have the partial type hierarchy in (148). Every instance of a DNV will inherit the constraints from one of these types.

(148)



2.6.1 Transitive Stem

Denominal verbs formed with *ʔu-* are transitive. They can passivize and the non-agentive noun phrase can be definite. The sentence in (67), repeated here as (149), illustrates the passivizability of *ʔu-* forms. Here, the participant which would be the DNV host is the subject of the passive verb *ʔuyuʔaaɬat* "was found by".

(149) ʔuyuʔaaɬatʔiš ʕiniiƛ
ʔu-(y)uʔa:ɬ-'at-ʔi·š ʕini:ƛ
TRANS-find-PASS-3.IND dog
"He found a dog." (FW 484)

Also, definite noun phrases can occur as the object of an *ʔu-* verb. In (150), the object is a possessed NP.

(150) ʔuʔiicšiƛs **hupkčuuʔakitk**
ʔu-'i·c-ši(ƛ)-s hupkču:-a·k-ʔitk
TRANS-ingest-MOM-1SG dumpling-POSS-2SG.REL
"I ate your dumplings." (FW 307)

The stem *ʔu-* is clearly not a NP, and it has no real syntactic/semantic value. It serves only as a phonological stem for DNV suffixes in order to create a transitive verb. The feature structure associated with the verb *ʔuʔiic* "eat" is shown in (151). The ARG-ST list of the verb has two items on it, thus making it transitive and suitable as a stem for a passive verb form. The synsem of the stem is *null*, because it contributes nothing to the verb except its phonological value.

(151)
$$\begin{bmatrix} \text{PHON} & f_{eat}(\boxed{1}) = \langle \text{ʔuʔiic} \rangle \\ \text{SYNSEM} & \begin{bmatrix} \text{ARG-ST} & \langle \text{NP}:\boxed{2}, \text{NP}:\boxed{3} \rangle \\ \text{CONT} \mid \text{LZT} & \left\{ \begin{bmatrix} \textit{eat-rel} \\ \text{ACT} \quad \boxed{2} \\ \text{UND} \quad \boxed{3} \end{bmatrix} \right\} \end{bmatrix} \\ \text{STEM} & \begin{bmatrix} \text{PHON} & \boxed{1} \\ \text{SYNSEM} & \textit{null} \end{bmatrix} \end{bmatrix}$$

By extracting the information specific to the suffix *-'i·c* "eat" from (151), we get the general constraints on the *trans-dnv-lexeme* type shown in (152). Specific instances of transitive DNVs will inherit all these constraints and add their own (regarding the precise phonological function and semantics).

(152)
$$\begin{bmatrix} \textit{trans-dnv-lexeme} \\ \text{PHON} \quad f(\boxed{1}) \\ \text{SYNSEM} & \begin{bmatrix} \text{ARG-ST} & \langle \text{NP}:\boxed{2}, \text{NP}:\boxed{3} \rangle \\ \text{CONT} \mid \text{LZT} & \left\{ \begin{bmatrix} \textit{dnv-rel} \\ \text{ACT} \quad \boxed{2} \\ \text{UND} \quad \boxed{3} \end{bmatrix} \right\} \end{bmatrix} \\ \text{STEM} & \begin{bmatrix} \text{PHON} & \boxed{1}\langle \text{ʔu} \rangle \\ \text{SYNSEM} & \textit{null} \end{bmatrix} \end{bmatrix}$$

2.6.2 Relative Stems

Nuu-chah-nulth has two relative stems, one of which is definite (*yaq-*) and the other indefinite (*qʷi-*). Verbs which head relative clauses are simultaneously formed with a relative stem and are marked with a relative mood suffix, either the relative or indefinite relative mood.

The sentences in (153) show relative clauses which are acting as nominals, but the sentence in (154) is modifying the noun *čiːma* "knife".[18]

(153) a. ʔuʔaapʔiš Kim yaquwaƛitʔitq Sandy
ʔu-ʼaˑp-ʔiˑš Kim yaq-waƛ[L]-(m)it-ʔitq Sandy
TRANS-buy-3.IND Kim REL.DEF-find-PAST-3.REL Sandy
"Kim bought what Sandy found." (FW 313)

b. ńaačičiƛʔiš Kim qʷiyuʔaaɬʔitk Sandy
ńaːci-ši(ƛ)-ʔiˑš Kim qʷi-(y)uʔaːɬ-ʔitk Sandy
see-MOM-3.IND Kim REL.INDEF-find-2SG.REL Sandy
"Kim saw what Sandy found." (FW 289)

(154) sačkaqʔiš čʼiima yaquʔaaɬis
sačk-aq-ʼiˑš čʼiːma yaq-(y)uʔaːɬ-iˑs
sharp-very-3.IND knife REL.DEF-find-1SG.INDEF
"The knife that I found is very sharp." (FW 8)

In Sag's (1997) analysis of relative clauses in English, the verb heads the relative clause. The argument which is extracted is treated as a non-canonical argument on the verb's ARG-ST. The feature structure for *yaquʔaaɬis* in (154) above would be as in (155). The head features of the relative verb include the binary feature MC, or Main Clause, which is negative. For a VP to be a sentence it must be +MC, and so a relative clause headed by *yaquʔaaɬis* could not be a sentence. The verb in (155) also has a MOD feature indicating that it is the modifier of a noun which is coindexed with the *gap* item on its ARG-ST.

[18]It may seem odd that the definite relative is present with the indefinite relative mood, but this simply indicates that "the bound referent is particularized but indefinite" (Rose 1981, 128).

(155)
$$\left[\begin{array}{ll} \text{PHON} & \langle \text{yaqu?aaɬis} \rangle \\ \text{SYNSEM} & \left[\begin{array}{ll} \text{SYN} & \left[\begin{array}{ll} \text{HEAD} & \left[\begin{array}{ll} \textit{verb} & \\ \text{MC} & - \\ \text{MOD} & \left[\text{HEAD} \quad \left[\textit{noun:j}\right]\right] \end{array}\right] \\ \text{VALENCE} & \left[\begin{array}{ll} \text{SUBJ} & \langle\ \rangle \\ \text{COMPS} & \langle\ \rangle \end{array}\right] \end{array}\right] \\ \text{ARG-ST} & \langle \text{PRO:}\boxed{1}\text{1SG},\ \textit{gap:}\boxed{2} \rangle \\ \text{CONT} \mid \text{LZT} & \left\{\left[\begin{array}{ll} \textit{find-rel} & \\ \text{ACT} & \boxed{1} \\ \text{UND} & \boxed{2} \end{array}\right]\right\} \end{array}\right] \end{array}\right]$$

2.6.3 WH-question Stems

Much like the relative stems above, WH-stems act as hosts for DNV suffixes when they refer to the semantic argument attached to the host. In (156), *?aqa* "what" refers to the thing being made. The resulting DNV obligatorily takes the interrogative set of person-mood agreement suffixes, rather than the indicative. DNVs whose hosts are ordinary NPs do not have any such restrictions on them.

(156) ?aaqačiiɬitk
?aqa-(č)iˑɬ[L]-(m)it-k
what-make-PAST-2SG.INT
"What were you making?" (FW 285)

(157) waayaqiiɬk waas maḥtʼii
waayaq-(č)iˑɬ[L]-k waːs maḥtʼiː
which-make-2sg.inter ?? house
"Which house are you making anyway?" (FW 287)

When a WH-stem refers to a subject, it cannot serve as host to a DNV suffix. But rather than acting as an NP it acts as a syntactic verb.[19] In (158), *?ačaq* refers

[19]Davis and Sawai (2001) treat subject WH-words as containing an auxiliary suffix *-aq*. However, they only show it occurring with *?ača* "who". Note also that the stem *waːyaq-* ends in */aq/*, but refers to the object in (157). Rose (1981) does not analyze subject WH-words as containing auxiliary

to the subject of the verb *maaḥtiiqiiɬ* "make a house", but acts as a verb, taking the past tense and agreement morphology.

(158) ʔačaqitḥ maaḥtiiqiiɬ
ʔačaq-(m)it-ḥ maḥtiː-(č)iːɬ[L]
who-past-3.int house-make
"Who was making the house?" (FW 286)

2.6.4 Summary

The stems listed in this section cannot be considerd NPs, since they never appear as such in the syntax, and they can form transitive DNVs, while NPs cannot. This disjunction was be captured in the type hierarchy, and each of the types with a grammatical stem has its own constraints. I described the constraints on *ʔu-* DNVs in detail, showing that this stem provides a phonological value for input to the morphology of the suffix.

2.7 Summary

In this chapter, I argued that DNVs are created from phrases, and that DNV suffixes attach to the first word of these phrases. I also argued that these host phrases do not exist in the argument structure of the resulting DNV. I discussed the semantics of several DNV suffixes and related them to the sublexical modality of Koenig and Davis (2001), and discussed Van Geenhoven, Van Geenhoven's (1996, 1998b) analysis of WH-questions in West Greenlandic DNVs and Davis and Sawai's (2001) arguments against such an analysis for WH-questions in Nuu-chah-nulth DNVs.

I presented an analysis of Nuu-chah-nulth DNVs in HPSG using constructions and Linearization Theory. I divide DNVs into two classes. The first is one in which DNV suffixes are attached lexically to the first word of their host phrase, and this phrase, which contains a DNV suffix, is converted to a verb. The members of the second class of DNVs all have grammatical stems.

---

suffix.

Chapter 3
Comparisons

Nuu-chah-nulth is not the only language with DNV affixes that carry specific meanings. Other Wakashan languages, from both the northern and southern branches, have DNV suffixes with a nearly identical range of meaning. The Eskimo-Aleut languages also have a large number DNV suffixes (Sadock 1980, Johns 2003), and since there is a body of literature concerned with two such languages, a large part of this chapter revolves around West Greenlandic and Inuktitut. Other language families whose languages have a smaller number of DNV affixes include Paleo-Siberian, Salish, Chemakuan, and Tsimshianic.

There has been some discussion in the literature as to whether DNV constructions are a kind of noun incorporation (NI). Sadock (1980, 1991), who discusses West Greenlandic, is of this view, as is Wojdak (2003c), who discusses Nuu-chah-nulth. On the other hand, Sapir (1911a) and Mithun (1984, 1997) argue against placing DNVs with NI. In §3.1, I compare DNVs in four different languages and show how the properties of the DNVs correlate with various other factors in the languages, and how this compares with the typology of NI proposed by Rosen (1989).

Finally, because of the number of analyses given for DNVs in various languages, I contrast them with my own. Wojdak (2003c) presents an analysis of Nuu-chah-nulth DNVs in the framework of the Minimalist Program. I discuss her analysis in §3.2, and present some data which is problematic. Of the various analyses of Eskimo-Aleut languages, I discuss how Sadock's (1991), Malouf's (1999), and Johns' (2003) analyses might be applied to Nuu-chah-nulth.

3.1 DNVs Outside Nuu-chah-nulth

Several languages outside the Southern Wakashan family have DNV constructions, and in this section I discuss three of these, West Greenlandic, Kwak'wala, and Halkomelem. These three languages, plus Nuu-chah-nulth illustrate the diverse properties associated with DNVs cross-linguistically.

3.1.1 Eskimo-Aleut Languages

Eskimo-Aleut languages possess a large number of DNV suffixes: Smith (1978) lists approximately 65 for Labrador Inuttut. The suffixes in (159) below are the among

the most frequently used in West Greenlandic (Van Geenhoven 1998b, 23–25).

(159) -liur "make"
-tur "eat, drink"
-rniar "sell"
-si "get, buy"
-qar "have"

The meanings associated with these suffixes are fairly specific, though not as specific as those in Nuu-chah-nulth (Mithun 1999). As Mithun (1999, 50) points out, the Yupik "suffix *-tur-* 'eating, wearing, taking, smoking, thinking', is as general as the English 'have' in 'have an ice cream', 'have a jacket', 'have Communion', 'have a smoke', and 'have a thought'."

(160) akutarturtuq "he's eating Eskimo ice cream" (akutaq "Eskimo ice cream)
atkugturtuq "he's wearing a parka" (atkuk "parka")
augturtuq "he's taking Communion" (auk "blood")
puyurturtuq "he's smoking" (puyuq "smoke")
umyuarturtuq "he's thinking" (umyuaq "mind")

West Greenlandic DNVs are formally intransitive, as evidenced by verbal inflection and case marking (Sadock 1980, Baker 1988). Agreement on DNVs is in the intransitive paradigm, marking only the subject, while the transitive paradigm marks both the subject and object. In (161), the DNV *timmisartuliorpoq* "make an airplane" is marked with the intransitive 3rd person singular subject suffix, *-oq*, not the transitive *-aa*, which also indicates a 3rd person singular object. West Greenlandic, being an ergative language, puts both the object of a transitive and the subject of an intransitive in the absolutive case. Subjects of DNVs, like *Søren* in (161), is in the absolutive case.

(161) Suulut timmisartu-lior-p-oq
Søren(ABS) airplane-make-INDIC-3SG
"Søren made an airplane." (Sadock 1980, 311)

As in Nuu-chah-nulth, West Greenlandic makes use of an empty stem, *pi-*, glossed by Sadock (1980) as "thing".[1] The overt object of a *pi-* verb appears in the instrumental case, as we see with *sapanngamik* "bead (INST" in (162).

[1]As Sadock notes, *pi-* can also take the place of a verbal stem.

(162) Sapanngamik pisivoq
sapanngaq-mik pi-si-v-oq
bead-INST thing-get-INDIC-3SG
"He bought a bead." (Sadock 1980, 307)

DNVs with *pi-* as stems are intransitive, just as are DNVs with nouns as stems: the argument is in instrumental case, not in absolutive case, and is therefore not a direct object. This is not the case with Nuu-chah-nulth DNVs formed with *ʔu-*, which are transitive while DNVs that "incorporate" an NP are intransitive (see §2.6).

Sadock (1980) shows that WH-words can also be stems for DNVs in West Greenlandic, as they are in Nuu-chah-nulth. But unlike in Nuu-chah-nulth, WH-words in West Greenlandic do not obligatorily take DNV suffixes. Thus, *su* "what" can take a DNV suffix, as in (163a), or stand as an overt object, as in (163b).

(163) a. Sutorpit?
su-tor-p-it
what-eat-INTER-2SG
"What did you eat?" (Sadock 1980, 312)

b. Sumik nerivit?
su-mik neri-v-it
what-INST eat-INTER-2SG
"What did you eat?" (Sadock 1980, 312)

The same stem, *su*, can appear as the stem of a DNV which is in a relative clause. West Greenlandic differs from Nuu-chah-nulth in this respect: as we saw in §2.6, Nuu-chah-nulth has a two special relative stems, in addition to the WH-stem.

Sadock (1980) claims that West Greenlandic does not allow doubling of the incorporated noun, but does allow stranding of modifiers of the incorporated noun. Thus the sentence in (164), with "sardine" both incorporated and a free argument (and modified by the number 276), is not valid. This lack of doubling, at the very least, does not preclude a syntactic analysis where the incorporated noun is in fact the head of a noun phrase in the syntax. Such an analysis prohibits (164) by something equivalent to the Theta Criterion (Chomsky 1981), which forbids more than one syntactic argument from being assigned the same theta-role.

(164) *276-inik ammassannik ammassattorpoq
276-inik ammassak-nik ammassak-tor-poq
276-INST.PL sardine-INST.PL sardine-eat-INDIC.3SG

"He ate 276 sardines (intended)." (Sadock 1986, 28)

However, external modifiers, including numerals, adjectives, and relative clauses, are allowed with DNVs. The external modifier, e.g, the numeral 276 in (165), appears in the instrumental case and precedes the verb. In a free NP, modifiers follow the noun, as *ilivitsut* "whole" and *marluk* "two" follow *nipisat* "lumpfish" in (165).

(165) ...Paliitsit 276-inik ammassattortoq nipisallu
Paliitsit 276-inik ammasasak-tor-toq nipisa-t-lu
Paliitsit 276-INST.PL sardine-eat-NOM.PART.3SG lumpfish-PL-CONJ
ilivitsut marluk
ilivitsoq-t marluk
whole-PL two
"...that Paliitsit ate 276 sardines and two whole lumpfish."
(Sadock 1986, 28)

Sadock (1986) notes that the sentence in (165) also illustrates that the stem of a DNV can be part of a conjunction. This behaviour is also similar to Nuu-chah-nulth (see §2.3.1).

As regards external modifiers, Van Geenhoven (1998b) argues that these modifiers are in fact full NPs, as all modifiers "are formally nouns" (Sadock 1980, 306), being either root nouns or nouns derived from verbs. External modifiers appear in the same case (i.e., instrumental) as demoted objects in antipassive verbs. In (166a), *arnamik* "woman" is the demoted object of an antipassive verb and is in the instrumental case, as is the external modifier *kusanartumik* "beautiful" in (166b), which involves a DNV.

(166) a. Angut arnamik unataavoq.
man(ABS) woman-INST beat-ANTIPASS-INDIC-3SG
"The man beat a woman." (Sadock 1980, 306)

b. Kusanartumik sapangarsivoq.
beautiful-NOM-INST bead-get-INDIC-3SG
"He bought a beautiful bead." (Sadock 1980, 307)

Another similarity to Nuu-chah-nulth is that Eskimo-Aleut languages do not make use of compounding (Sadock 1991). Therefore, they cannot have compounding NI, where a verb and a noun compound to form a verb.

3.1.2 Kwak'wala

All members of the Wakashan family have DNV suffixes, and they seem to have been present in Proto-Wakashan. When comparing Nuu-chah-nulth with Kwak'wala, Sapir (1911b) presents a number of DNV and other lexical suffixes in the two languages which appear to be cognate. Within the southern branch many of the DNV suffixes of Makah have obvious cognates in Nuu-chah-nulth. In his list of lexical suffixes, Davidson (2002) gives both the Nuu-chah-nulth and Makah forms for many of them. To take a single example, the Nuu-chah-nulth suffix *-na·k* "have" has the cognates given in (167) in Kwak'wala and Makah.[2]

(167) The suffix "have" in three Wakashan languages

Nuu-chah-nulth	-na·k
Kwak'wala	-nuk^{w} (Sapir 1911b, 17)
Makah	-da·k^{w} (Davidson 2002, 363)

The similarity of Nuu-chah-nulth and Makah in general suggests that DNV suffixes in the two languages may have the same properties, but there is little information on this topic in Makah. On the other hand, Anderson (1992) discusses DNVs in Kwak'wala in some depth. One primary difference between Kwak'wala and Nuu-chah-nulth is the ability in Kwak'wala to double the stem of a DNV with an overt object. In (168), *q'əmdzək^{w}* "salmonberry" appears twice: once as the host of the DNV suffix *-ila* "give feast", and again as the syntactic object. The DNV is transitive, as we can see from the OBJ case marking on (the word before) salmonberries.[3]

(168) q'əmdzək^{w}-ila-ix̣sd-ida bəg^{w}anəma-x̣a q'əmdzək^{w}i/
salmonberry-give.feast-want-DET man-OBJ salmonberries
"[when] the man wants to give a salmonberry feast (of salmonberries)"
(Anderson 1992, 30)

Kwak'wala also exhibits what at first glance appears to be the same clitic-like behaviour we found in Nuu-chah-nulth DNV suffixes, but a closer examination reveals this behaviour to be due to the transitive nature of Kwak'wala DNVs. The verb *k'əlxk'axa* "eat raw" is constructed by reduplicating the root *k'əlx* "raw".[4] In

[2]Makah has shifted nasals to voiced obstruents (see Kinkade 1985).

[3]Case markers and determiners surface as enclitics to the word preceding the NP to which they belong (Anderson 1984). Thus the determiner *-ida* appears on the verb because it precedes the noun *bəg^{w}anəma* "man".

[4]See Boas (1911) for a discussion of this particular reduplication pattern, $C_1V(C)C_2C_1aC_2$.

(169a), *t'əmxʷali* "gooseberries" is the syntactic object, as we can see from the case marking. In (169b), however, the verb has been passivized and *q'isina* "currants" is the subject, rather than the object.

(169) a. k'əlxk'axa-ʔaxa-ida bakʷəma-xa t'əmxʷali
eat.raw-also-DEM Indians-OBJ gooseberries
"The Indians also eat raw gooseberries" (Anderson 1992, 34)

b. la-i k'əlxk'axa-suʔ-əm-xat'-ida q'isina
AUX-they eat.raw-PASS-really-also-DEM currants
"Raw currants are also eaten" (Anderson 1992, 34)

The principal difference between Kwak'wala and Nuu-chah-nulth is the transitivity of the resulting verb. Stranding and doubling are allowed in Kwak'wala because DNVs are transitive, and they are disallowed in Nuu-chah-nulth because DNVs are intransitive. The analysis I presented in §2.5 can easily handle Kwak'wala DNVs, since the only difference is the transitivity of the resulting verb. A verb like *q'əmdzəkʷ* "give a salmonberry feast" would have a feature structure like that in (170). The argument structure of the DNV contains two items which correspond to the subject and the object. When the object is the same as the DNV host, as in (168) above, the *salmonberry-rel* will simply appear twice in the semantics of the sentence.

(170)
$$\begin{bmatrix} \textit{denominal-verb} \\ \text{PHON} \quad \langle \text{q'əmdzəkʷ} \rangle \\ \text{SYNSEM} \quad \begin{bmatrix} \text{ARG-ST} \quad \langle \text{NP:}\boxed{1}, \text{NP:}\boxed{2} \rangle \\ \text{CONT} \mid \text{LZT} \quad \boxed{3} \left\{ \begin{bmatrix} \textit{eat-rel} \\ \text{ACT} \quad \boxed{1} \\ \text{UND} \quad \boxed{2} \end{bmatrix}, \begin{bmatrix} \textit{salmonberry-rel} \\ \text{ARG} \quad \boxed{2} \end{bmatrix} \right\} \end{bmatrix} \\ \text{DOM} \quad \boxed{4} \ \text{STEM} \quad \begin{bmatrix} \textit{dnv-marked-noun-phrase} \\ \text{SYNSEM} \mid \text{CONT} \mid \text{LZT} \quad \boxed{3} \\ \text{DOM} \quad \boxed{4} \end{bmatrix} \end{bmatrix}$$

3.1.3 Halkomelem

Halkomelem, a Coast Salish language, has a very small number of DNV prefixes, which I list in (171). The meanings associated with them are somewhat general,

so DNVs formed with *c-* can mean "have X", "get X", "make X" or "do X". And as we have seen in Nuu-chah-nulth and West Greenlandic, the suffix meaning "eat", can also mean "drink", as in *ɬ-tih* "drink tea".

(171) Halkomelem DNVs (Gerdts and Hukari 2003)

c- "have, get, make, do"	kʷəmləxʷ "root"	c-kʷəmləxʷ "get roots"
	snəxʷəɬ "canoe"	c-nəxʷəɬ "make, have a canoe"
ɬ- "ingest, partake"	səplil "bread"	ɬ-səplil "eat bread"
	ƛ'ikʷən' "peas"	ɬ-ƛ'ikʷən' "eat peas"
txʷ- "buy"	leləm' "house"	txʷ-leləm' "buy a house"
	səplil "bread"	txʷ-səplil "buy bread"

Gerdts and Hukari (2003) show that DNVs in Halkomelem allow doubling, but do not allow the stranding of modifiers. An NP co-referent with the stem of the DNV can occur syntactically as an oblique argument. In (172), *sq'ʷi:l'məxʷ pay* "blackberry pie" is marked with the oblique marker *ʔə*.

(172) nem' ct ɬ-pay ʔə t^0ə sq'ʷi:l'məxʷ pay.
go we eat-pie OBL DET blackberry pie
"We are going to eat blackberry pie." (Gerdts and Hukari 2003)

The reason that the doubled NP is in the oblique case is that DNVs are surface intransitive (Gerdts and Hukari 2003). An NP co-referent with the stem of the DNV is prohibited as a direct object, with or without the transitive marker *-t* on the DNV.

(173) *niʔ txʷ-ka:(-t) kʷθə ka:.
AUX buy-car(-TR) DET car
"He bought a/the car." (Gerdts and Hukari 2003)

While doubling is permitted (in oblique case), modifiers may not be stranded. In (174), *sq'ʷi:l'məxʷ* "blackberry" cannot modify the stem of the DNV, *pay* "pie", either in oblique case or not.

(174) *nem' ɬ-pay (ʔə) kʷθə sq'ʷi:l'məxʷ.
go eat-pie OBL DET blackberry.
"Go and have the blackberry pie (intended)." (Gerdts and Hukari 2003)

In regard to doubling and stranding, Halkomelem is the opposite of West Greenlandic, which allows stranding but not doubling, as we saw in (3.1.1). I discuss the differences in (3.1.5), but for now, note that modifiers cannot normally appear without an overt noun.

Although stranding of modifiers is not allowed, stranding of heads is allowed in Halkomelem. The sentences in (175) show the prefix *c-* "have, etc." attaching to a modifier, thereby stranding the noun.

(175) a. ʔi ʔə č ʔəw' c-p'əq' šx̌'piw'ən?
AUX Q 2SUB LINK DNV-white shirt
"Do you have a white shirt?" (T. Hukari, p.c., 2003)

b. ʔi ʔə č ʔəw' c-x̌ew's səqiws?
AUX Q 2SUB LINK DNV-new pants
"Do you have a new pair of pants?" (T. Hukari, p.c., 2003)

Note that the head is not marked by an oblique marker as it would be in a case of doubling. In Halkomelem, as in Nuu-chah-nulth, an entire noun phrase can be verbalized.

3.1.4 Are DNVs a kind of Noun Incorporation?

The nature of noun incorporation has been a controversial issue for around 100 years now, and it is not settled yet. Kroeber (1909) described NI as "the combination into one word of the noun object of the verb and the verb functioning as the predicate of the sentence," while Sapir (1911a) took issue with the conflation of morphology and syntax that this definition required. He suggested that it was a specific type of noun-verb compound, much like synthetic compounds in English (e.g., *truck-driver* "someone who drives trucks").

In more recent discussions of NI, Mithun (1984) claims, like Sapir, that it is a case of lexical compounding, and divides it into four separate types representing four stages of a progression towards full NI. NI begins with the lexical compounding of a noun and a verb, which is followed by a deeper manipulation of argument structure, as oblique arguments are moved into the vacant position left by the incorporated noun. In the third stage, NI affects the discourse structure, backgrounding the incorporated noun. The incorporated noun in the fourth stage acts as a classifier, leaving the direct object position open for an ordinary NP. Baker (1988) proposes a syntactic analysis, and Sadock (1980, 1985, 1991) calls for a non-hierarchical grammar where morphology and syntax both play a role in noun incorporation. Arguing for a lexical analysis, Rosen (1989) simplifies Mithun's four types of incorporation into two: compound (these decrease the verb's valence), and classifier (these do not decrease the verb's

valence, but the argument must be more specific than the incorporated noun).

Arising from this argument over which component of the grammar is responsible for noun incorporation is the matter of which constructions to call "noun incorporation". There are two types of incorporation according to the lexical compound analysis, NI proper and DNVs (Mithun 1986). NI is the compounding of two unbound words, a noun and a verb. In DNVs, the verb is a bound morpheme — it cannot stand as a verb on its own. While the proponents of lexical compounds need to make this distinction, those who use syntactic approaches do not, since it must be assumed that morphology is handled by the syntax. Indeed, Sadock has based his work on NI primarily on the DNVs in West Greenlandic.

There is still no consensus on these issues. What we need to do is separate the two problems. What, if any, are the implications to the lexical analysis if DNVs were included in NI? Are there consistent differences between DNVs and NI beyond the obvious morphological difference? The typology of DNVs I describe in the next section seems to mirror the typology of noun incorporation that has been discussed in the literature.

3.1.5 Typology

I summarize the properties of DNVs in Halkomelem, Kwak'wala, West Greenlandic and Nuu-chah-nulth in (176).

(176)

	West Greenlandic	Halkomelem	Kwak'wala	Nuu-chah-nulth
transitive DNVs	no	no	yes	no
oblique arguments	yes	yes	no	no
null-headed NPs	yes	no	yes	yes
doubling	no	yes	yes	no
modifier stranding	yes	no	yes	no
head stranding	no	yes	yes	yes

Kwak'wala is entirely transitive, allowing complements in direct object case. Kwak'wala allows both the doubling of the stem of the DNV suffix and stranding

of the stems modifiers. This is matches Rosen's (1989) claim for NI, that transitive noun-incorporating verbs (i.e., classifier NI) will allow stranding and/or doubling. West Greenlandic and Halkomelem DNVs are intransitive: they allow only oblique objects. But West Greenlandic allows stranded modifiers, and Halkomelem allows doubled nouns. These facts run counter to Rosen's claim for NI, that intransitive noun-incorporating verbs (i.e., compounding NI) will allow neither stranding nor doubling. However, the DNVs in these two languages are not fully intransitive since the they can take complements, just not in the direct object case. This situation is quite different from that of Nuu-chah-nulth, where DNVs are absolutely intransitive and permit no complements.[5] Nuu-chah-nulth DNVs allow neither stranding nor doubling. Thus, after taking into account the oblique transitivity of West Greenlandic and Halkomelem, all four cases of DNVs fit Rosen's claim of two kinds of NI: transitive and intransitive. West Greenlandic, Halkomelem and Kwak'wala DNVs are transitive and allow stranding and/or doubling, while Nuu-chah-nulth DNVs are intransitive and do not.

Rosen (1989) also hypothesizes that transitive (classifier) NI interacts with a language's permitting null-headed NPs. She suggests that in languages with transitive NI, those which also allow null-headed NPs will exhibit stranding while those that do not allow such NPs will prohibit stranding. The reason for this patterning is that stranding is essentially the same as doubling, except that stranded modifiers belong to NPs with a null head. This neatly accounts for the fact that Halkomelem allows doubling but not stranding: it forbids null-headed NPs. On the other hand, Kwak'wala allows both doubling and stranding because it also allows null-headed NPs. Nuu-chah-nulth DNVs are intransitive, so we cannot see any effects of the null-headed NPs which are possible in the language. West Greenlandic presents a problem: DNVs are obliquely transitive, and stranding is permitted, as we would expect since the language allows null-headed NPs, but doubling of the stem noun is forbidden. Anderson (2000, 31) suggests that languages like West Greenlandic which prohibit doubling but allow stranding "do not regard identical nominals as mutually informative." In other words, West Greenlandic DNVs can take oblique complements which contribute their meaning to the thematic role of the DNV stem,

[5]Strictly speaking, I am referring only to those DNVs which semantically have two arguments — those with three semantic arguments are of course transitive, but the direct object has a different thematic role than the host, so it cannot count as doubling or stranding.

but the meaning they contribute cannot be identical to that of the stem.

The final feature of DNVs I discuss here is whether a language strands the head by suffixing a modifier of it, as in Nuu-chah-nulth, Kwak'wala and Halkomelem. These three languages share no feature with respect to DNVs other than this one so it must be an independent feature, one which I have argued is the ability of a NP to be the host of a DNV suffix. Now we have four independent features: a) the transitivity of DNVs, b) the possibility of null-headed NPs, c) the possibility of two identical nominals referring to the same thematic role, and d) the possibility of NPs as hosts of DNV suffixes. It is likely that the transitivity of DNVs in a language is a property of DNVs only, and unrelated to any other part of the language, but the possibility of null-headed NPs is, as Rosen (1989) remarks, a property of a language as a whole. As for the other two features, it is not clear whether these are specific to DNVs, or properties which have ramifications elsewhere in the grammar.

3.2 Wojdak's Analysis of Nuu-chah-nulth DNVs

Wojdak (2003a,b,c) presents an analysis of DNVs in Nuu-chah-nulth in the Minimalist Program (MP) framework. She argues that Nuu-chah-nulth DNV suffixes are affixal verbs (that is, they are merged into the tree under V, but require a stem) and non-*ʔu-* DNV stems are moved post-syntactically at phonological form (PF).

3.2.1 Wojdak's Arguments Against a Lexical Analysis

Wojdak (2003c) presents three arguments against a lexical analysis of Nuu-chah-nulth DNVs which I will address in turn. Her first argument is that the choice of a stem refers to syntactic output; that is, DNV suffixes attach to the first word of a phrase. But as I have shown, this phenomenon can be accounted for in HPSG with a larger inventory of more specific phrase types. The existence of such an inventory has been argued for to account for entirely different constructions, such as idioms (Riehemann 2001) and relative clauses (Sag 1997).

Wojdak's second argument involves the semantic interpretation of the DNV and its host. The problem is that the DNV and the stem to which it attaches do not form a semantic unit; the suffix forms a semantic unit with the noun phrase that the modifier which the suffix attaches to belongs to. However, as I have shown, it is possible to introduce the semantic relations of the DNV at the lexical level and have

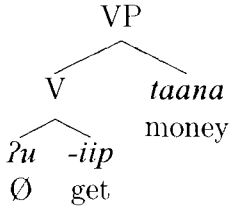
them percolate to the phrase level.

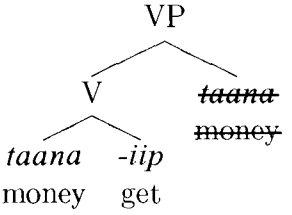
Wojdak's final argument against a lexical analysis is that it would have to stipulate that *ʔu-* DNVs are transitive while those whose host is an NP are intransitive. I agree that this is necessary, and I add that there is a further difference with *ʔu-* forms which suggests that DNV suffixes should not be treated as verbs.

3.2.2 Definite NPs

Wojdak assumes that DNV suffixes are bound transitive verbs. A DNV suffix is therefore inserted into the syntax as the head of a VP. Because it is a suffix, it must attach to a stem. One possible stem is *ʔu-*, which has no semantic value and is merged adjacent to the DNV. If *ʔu-* is not present, then the first word of the object is moved post-syntactically to adjoin the DNV.

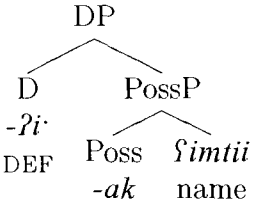
(177) (Adapted from Wojdak 2003a)

a.


b.


The complements of the DNV suffixes in (177a) and (177b) are identical. But, as we saw in §2.4, and Wojdak (2003b) shows, DNV suffixes cannot attach to the first word of a definite NP. Wojdak assumes that definite NPs are in fact DPs, as in (178).

(178) (Adapted from Wojdak 2003b)



"his/her name"

Wojdak notes that if *ʔu-* were not merged with a DNV and a DP such as this were its complement, then the definite suffix *-ʔi·*, which is linearly the first item of the DP, would be moved post-syntactically to adjoin to the DNV suffix, which is clearly ungrammatical. Her (2003b) proposal for banning this impossible situation is to specify that only bare NPs are selected as complements of DNV suffixes. But definite NPs (i.e., DPs), are possible when *ʔu-* is the stem of a DNV. I repeat example (150) from §2.6 as (179) below. The object, *hupkčuuʔakitk* "your dumplings", is a definite NP.

(179) ʔuʔiicšiƛs hupkčuuʔakitk
ʔu-ʔi·c-šiƛ-s hupkču:-a·k-ʔitk
it-ingest-MOM-1SG dumpling-POSS-2SG.REL
"I ate your dumplings." (FW 307)

The difference between DNVs formed with *ʔu-* and those which have a phrasal domain of affixation extend beyond transitivity. While the "object" of a DNV must be indefinite when its first word is the stem of the DNV, there is no such restriction on a DNV whose stem is *ʔu-*. Thus, contrary to Wojdak's claim, DNVs can select DP objects. This is an empirical difference between DNVs that incorporate and those that take the "expletive" *ʔu-*.

3.2.3 Summary

Of Wojdak's arguments against a lexical analysis of Nuu-chah-nulth DNVs, the analysis I presented in chapter 2 overcomes two, and the third is countered by additional data regarding the difference between DNVs formed from *ʔu-* and those formed from noun phrases.

3.3 Eskimo-Aleut Analyses

In this section I discuss two analyses of Eskimo-Aleut DNVs and to what extent they are portable to Nuu-chah-nulth. I discuss Sadock's Autolexical account of West Greenlandic in §3.3.1, and then Johns' light verb account of DNVs in several Eskimo-Aleut languages in §3.3.2.

3.3.1 Sadock's Analysis

Sadock (1985, 1991) has developed a model of language in which each component of grammar (syntax, morphology, semantics, phonology, etc.) is an independent module. Instead of a derivation proceeding through an assembly line of modules, as in the Chomskyan tradition, each of Sadock's modules interact with each other simultaneously. Linguistic universals are encoded in constraints on the interaction of the modules. Two such sets of constraints handle mismatches between the morphology and syntax modules. The Linearity Constraint is concerned with the mismatches in linear order between the syntactic and morphological modules, while the Constructional Integrity Constraint deals with constituency mismatches between these two modules.

(180) Linearity Constraint (Sadock 1991, 103)

a. Strong:
The associated elements of morphological and syntactic representations must occur in the same linear order.

b. Weak:
The associated elements of morphological and syntactic representations must occur in as close to the same linear order as the morphological requirements of the lexemes allow.

(181) Constructional Integrity Constraint (Sadock 1991, 103)

a. Strong:
If a lexeme combines with a phrase P in the syntax and with a host in the morphology, then the morphological host must be associated with the head of the syntactic phrase P.

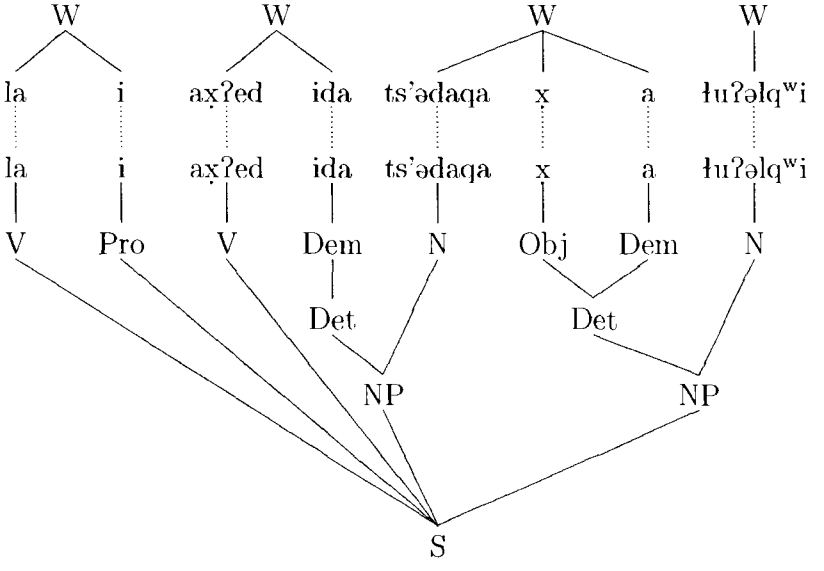
b. Weak:
If a lexeme combines with a phrase P in the syntax and with a host in the

morphology, then the morphological host must be associated with some element of the syntactic phrase P.

The reason for a weak and a strong version of the two constraints is to restrict the degree of freedom that syntax and morphology have with respect to each other via the Morphosyntactic Homomorphism Condition (MHC). The MHC states that if either the LC or CIC is completely disobeyed, then the strong version of the other constraint must be obeyed. The cliticization of determiners in Kwak'wala is an example where the CIC is disobeyed, but the Strong LC is obeyed. The clitics *-ida*, *ẋ* and *a* are syntactically associated with the phrases following the words they are morphologically attached to, but they appear in the same linear position in the morphological and syntactic modules.

(182) a. la-i aẋ?ed-ida ts'ədaqa-ẋ-a ɬu?əlq^{w}i
AUX-PRO takes-the woman-OBJ-the dishes
"The woman takes the dishes." (Sadock 1991, 64)

b. Kwak'wala (Sadock 1991, 65)



A violation of the LC would appear as crossed lines in the interface between the two modules, represented by the dashed lines. The MHC is satisfied with respect to the clitics because they conform to the Strong LC while at the same time they violate the CIC.

Sadock (1991, 105) defines syntactic incorporation as a lexeme combining "with a stem in the morphology and with a phrase in the syntax," and proposes

the defeasible Incorporation Principle, which states that such a lexeme will obey the Strong CIC. Since the LC does not hold for syntactic incorporation, there is an ambiguity as to which direction it is violated in: does the noun "move" next to the verb, or does the verb "move" next to the noun in noun incorporation? Sadock points out that the morphological head (i.e., the part that determines the category of the resulting stem) always remains in its syntactic position. In other words, the noun "moves" next the verb.

Sadock analyzes West Greenlandic DNVs as syntactic incorporation, where the head of an NP in the instrumental case in the syntax is the stem of a verb in the morphology. Nuu-chah-nulth DNVs present a problem for this kind of analysis: it is not the head but the first word of an NP which the "verb" attaches to. This is a violation of both the Strong LC and the Strong CIC: if we assume the DNV suffix is a verb in the syntax, then the first word of the NP ends up to the left of the verb while the rest of the NP is to the right of it (violating the Strong LC), and morphological host that the verb is attaching to is not the head of the NP (violating Strong CIC). Because the Strong CIC is not obeyed, the Incorporation Principle is violated.

Another problem in applying Sadock's syntactic incorporation analysis to Nuu-chah-nulth is the stem *ʔu-*. As we saw in §2.6, DNVs formed with *ʔu-* are fully transitive, while those incorporating an NP are not. This suggests that, as a verb, each DNV suffix selects an oblique when it incorporates and a direct object when it attaches to *ʔu-*.

3.3.2 Johns' Analysis

Johns assumes that DNV suffixes in Inuktitut are instances of obligatorily incorporating verbs. Not all Inuktitut verbs are incorporating, however. Johns' assumption leads her to pose three questions (Johns 2003, 6), which I repeat in (183).

(183) a) Why is noun incorporation obligatory when it is possible?

b) Why is it restricted to a certain set of verbs? and

c) Why is it restricted to these particular verbs and not others?

Johns' considers the semantic content of DNV suffixes and, making use of Koenig and Davis's (2001) model of lexical semantics, suggests that DNV suffixes have a modal component but lack a situational core, and that any verb in Inuktitut that lacks a situational core must incorporate a word that does have one, e.g, a

noun. Following proposals made by Harley (2001), Johns considers verbs which lack a situational core to be light verbs.

Johns derives all DNVs in Inuktitut from three semantic operators: Quantity (Q), Negation (˜), and Identity (I). The basic light verb types are possession, identity, and iterativity, which are exemplified in (184).[6]

(184) a. Possession:

qimmi-qaq-tunga
dog-have/exist-INTR.PART.1SG

"I have a dog." (Iqaluit) (Johns 2003, 13)

b. Identity:

Saali ilisaiji-u-juq
sally teacher-be-INTR.PART.3SG

"Sally is a teacher." (Mittimatalik) Johns (2003, 13)

c. Iterativity:

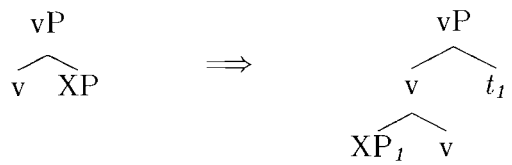
qukiuti-liri-juq
rifle-do.with-INTR.PART.3SG

"He/she is playing with/fixing the rifle." (Mittimatalik) (Johns 2003, 16)

The light verb of possession is devoid of all semantic content, and Johns represents it as [ ]. The identity verb is represented as [I], and the iterativity verb as [Q]. To each of these basic light verbs Johns adds the semantic operators in different ways to account for each of the DNV suffixes in Inuktitut. For example, the suffix *-nngur* "become" has the quantity operator applying to the identity operator: [QI].

The syntax of DNVs, in Johns' view, is as in (185). The noun originates in [Comp, vP], and moves to v, where it adjoins to the DNV suffix.

(185)



As I discuss in detail in the following sections, the DNV suffixes in Nuu-chah-nulth do not suit an analysis like that proposed by Johns for Inuktitut. The

[6] Johns draws her examples from several Eskimo-Aleut languages.

semantic differences in Nuu-chah-nulth DNVs cannot be reduced to differences in modality, and some Nuu-chah-nulth DNVs are semantically ditransitive, which, in Johns' approach, would involve an additional phrasal level that is incompatible with a light verb analysis.

3.3.2.1 Modality

Consider the Nuu-chah-nulth suffixes which involve possession listed in (186).

(186) -na·k "have" -ʔa·ta "need"
-'a·p "buy" -ʔi·p "get"
-ʔiƛ "take" -ayi· "give"

According to Johns, the difference between *-na·k* "have" and *-ʔa·ta* "need" is one of negation. The corresponding suffixes in Inuktitut, *-qaq* "have" and *-iruti* "lack", have the representations [ ] and [˜] respectively. But there is more to the semantics of Nuu-chah-nulth *-ʔa·ta* than not possessing something — it implies that while the possession relation does not hold, it should. The "should" meaning is what we get from a deontic modal. The simple negation of possession is accomplished either by the use of the negative existential verb *wiḱiit* or by attaching the "have" suffix to the negative stem *wik*.[7]

(187) a. wiḱituks ʕiniiƛ
wiḱi:t-uk-s ʕini:ƛ
not.exist-POSS-1SG dog
"I don't have a dog." (FW 355)

b. wiknaaks ʕiniiƛ
wik-na·k-s ʕini:ƛ
NEG-have-1SG dog
"I don't have any dogs." (FW 356)

The difference between *-na·k* "have" and *-ʔa·ta* "need" can be captured by Koenig and Davis's (2001) deontic modal base, so perhaps Johns' approach should be modified to include a deontic operator.

As I demonstrated in §2.2, it is not possible to differentiate the meanings of *-'i·p* "get", *-ʔiƛ* "take", and *-ʔa·p* "buy" on the basis of the modals used by Koenig

[7]It is quite likely that the verb *wiḱiit* "not exist" is historically derived from the negative particle and some DNV suffix, but the suffix is no longer productive, only showing up on this one word.

and Davis (2001). Johns' modal operators fare no better in this regard. Each of these suffixes are an inchoative form of possession, represented by Johns as Q[ ] — all three meanings are represented by a single suffix in Inuktitut. There is no way to add the appropriate meaning with the three modal operators that Johns uses.

3.3.2.2 Corresponding Unincorporating Verbs

At least one DNV suffix in Nuu-chah-nulth has a corresponding "unincorporating" verb with the same meaning. The suffix *-'a·p* and the verb *ma:kuk* both mean "buy". This is problematic for Johns' analysis because she claims that the difference between incorporating and free verbs is semantic: incorporating verbs (DNV suffixes) lack a situational core. For her, if a verb incorporates, then it must be more general in meaning than a free verb with similar meaning. This does not seem to be the case with *-'a·p* and *ma:kuk*.

3.3.2.3 Ditransitive DNVs

Another problematic suffix for Johns' approach is *-ayi·* "give". In Eskimo-Aleut languages, DNVs may be transitivized, thus adding an additional argument — an agent. DNV suffixes can still be treated as light verbs in these words because the agent is introduced by morphology on the entire N+V stem. But DNVs formed with *-ayi·* are inherently transitive, and therefore cannot be analyzed as light verbs.

While the Ahousaht dialect of Nuu-chah-nulth has, to the best of my knowledge, only one syntactically transitive (semantically ditranstive) DNV suffix, Davidson's (2002) lists *-ḥin* "deprive", the opposite of give, for the dialect of Tseshaht and *-si·ċa:p* "send", a type of giving, for Makah.

3.3.2.4 Summary

Nuu-chah-nulth presents three problems for Johns' light verb analysis. First, the differences between the meanings of Nuu-chah-nulth DNVs cannot be reduced to differences in sublexical modality. Johns assumes that only the modal component of DNV suffixes is specified. Second, like Wojdak, Johns treats DNV suffixes as verbs, but I have shown that this is not compatible with the data, particularly with respect to DNVs formed from the transitive stem *ʔu-*. Finally, the existence of semantically ditransitive DNVs in Nuu-chah-nulth is problematic, since Johns must analyze these

as having a complex syntactic structure.

3.4 Conclusion

In this chapter, I compared DNV constructions in four languages, West Greenlandic, Kwak'wala, Halkomelem, and Nuu-chah-nulth. I discussed the properties associated with DNVs in each of these languages and how they relate to the presence of other properties, such as allowing null-headed NPs. I also compared Wojdak's (2003a, 2003b, 2003c) analysis of Nuu-chah-nulth DNVs with the analysis I presented in the previous chapter. I show that her analysis does not account for all the facts, particularly with respect to transitivity and DNVs formed from the transitive stem *ʔu-*. Finally, I explored two analyses of Eskimo-Aleut DNVs, one proposed by Sadock (1991) and one by Johns (2003), and discussed the problems that Nuu-chah-nulth poses for each of them.

Chapter 4
Conclusions

In this thesis, I discussed a class of suffixes in Nuu-chah-nulth which create denominal verbs. I presented an analysis of these verbs within the framework of HPSG, making use of recent developments in the areas of constructions and linearization. I compared my analysis with that of Wojdak (2003a,b,c), who analyzes the same class of suffixes from a Minimalist Program perspective, and also with the analyses similar suffixes in Eskimo-Aleut languages by Sadock (1980, 1991) and Johns (2003).

4.1 Data and Analysis

I argued in chapter 2 that DNVs are formed from noun phrases rather than nouns. DNV suffixes in Nuu-chah-nulth attach to the first word of a noun phrase which corresponds to one of the semantic arguments of the resulting DNV. NPs which include modifiers and those with conjoined nouns can both have their first words suffixed by a DNV suffix. These suffixes thus exhibit an interaction between word formation and syntactic structure unlike typical morphology. Rather, they behave more like clitics, as Miller (1992) and Halpern (1995) describe them.

I also argued that the "incorporated" noun is not a syntactic argument. The behaviour of most DNVs is identical to that of intransitive verbs with respect to passivization and imperative agreement. Exceptions to this generalization are DNVs with three semantic arguments and DNVs formed with the transitive stem *ʔu-*; both of these types are surface transitives.

A further distinction between DNVs formed from noun phrases and those formed from the stem *ʔu-* is that "incorporated" NPs cannot be definite in the former, while their unincorporated counterparts can be in the latter.

I discussed the semantics of DNVs as the relate to the suggestions of Koenig and Davis (2001) for the structure of lexical semantics. In particular, they split semantics into two components, a set of semantic relations and a set of modal operators which apply to the relations. While many DNVs share a small number of semantic relations (particularly the possessive relation), others do not. It is not clear why the semantic relations are distributed in this way.

A DNV built from a noun phrase is inserted in the syntax as an ordinary verb — it just happens to be syntactically complex. To begin with, a DNV-marked noun

phrase is a noun phrase, and all the constraints that apply to a noun phrase apply to it. But this type of noun phrase contains a word with a DNV suffix on it. This DNV-marked noun phrase then undergoes a change of category, from noun phrase to verb, so that it may appear in the syntactic position of a verb in a sentence.

It was necessary to make a distinction between phrases which can appear in the syntax and those which cannot, just as there is a distinction between words, which can appear in the syntax, and lexemes which do not.

Subjects can appear between the first word and the remainder of the incorporated NP, and so I proposed that DNVs are made up of two domain objects, corresponding to those two units. The remainder and the subject are both in the same topological field, and so either can appear before the other, but both follow the first word of the incorporated NP.

4.2 Comparisons

I compared Nuu-chah-nulth DNVs with those in West Greenlandic, Kwakwala, and Halkomelem, and found each had different properties. Only Kwakwala DNVs are completely transitive, with syntactic arguments co-referent with the incorporated noun, though West Greenlandic and Halkomelem allow oblique co-referent arguments. This transitivity (or semi-transitivity) interacts with whether the language allows null-headed NPs: a language which satisfies both requirements also allows stranded modifiers. The ability to strand heads (like Nuu-chah-nulth) seems to be unrelated to other features of the languages.

Wojdak (2003a,b,c) proposes a Minimalist Program analysis of Nuu-chah-nulth DNVs, and presents three arguments against a non-syntactic analysis. I showed that my analysis overcomes two of these, and that her third argument falls through. This last argument held *ʔu-* forms of DNVs would have to be accounted for separately from incorporating forms in a non-syntactic analysis. While this is true, I showed that there is empirical evidence against treating the two phenomena in the same way: DNVs with a NP host are intransitive, but *ʔu-* forms are transitive.

Because of the similarity of Nuu-chah-nulth DNVs to those in Eskimo-Aleut languages, I also examined the applicability of two analyses of the latter. Sadock (1980, 1991) analyzes West Greenlandic DNVs using his Autolexical Grammar, where the suffixes are verbs in the syntax. This approach would fall afoul of the difference between transitive and intransitive DNVs in Nuu-chah-nulth (West Greenlandic

DNVs are intransitive whether they incorporate a noun or not). The other analysis I discussed is that of Johns (2003) for Inuktitut. I show that the semantic difference between certain suffixes in Nuu-chah-nulth cannot be reduced to differences in modality, as Johns claims for Inuktitut. Also, the existence of ditransitive suffixes is not predicted by her analysis.

Bibliography

ANDERSON, STEPHEN R. (1984), Kwakwala syntax and the Government-Binding theory, in Eung-Do Cook and Donna B. Gerdts (eds.) *The Syntax of Native American Languages,* vol. 16 of *Syntax and Semantics* 21–75, Academic Press, Orlando, Florida.

ANDERSON, STEPHEN R. (1992), *A-Morphous Morphology*, Cambridge University Press, Cambridge.

ANDERSON, STEPHEN R. (1993), Wackernagel's revenge: Clitics, morphology, and the syntax of second position, *Language* 69: 68–98.

ANDERSON, STEPHEN R. (2000), Lexicalism, incorporated (or incorporation, lexicalized), in *Proceedings of the 36th Meeting of the Chicago Linguistics Society: The Panels*, 13–34.

BACH, EMMON (1996), On the grammar of complex words, in Anna-Maria Di Sciullo (ed.) *Configurations: Essays on Structure and Interpretation*, Cascadilla, Somerville, MA, 1–16.

BAKER, MARK C. (1988), *Incorporation: A Theory of Grammatical Function Changing*, University of Chicago Press, Chicago.

BOAS, FRANZ (1890a), The Kwakiutl, in *Report of the 60th meeting of the British Association for the Advancement of Science (BAAS-R 60)*, 655–79.

BOAS, FRANZ (1890b), The Nootka, in *Report of the 60th meeting of the British Association for the Advancement of Science (BAAS-R 60)*, 655–79.

BOAS, FRANZ (1893), Vocabulary of the Kwakiutl language, *Proceedings of the American Philosophical Society* 34–82.

BOAS, FRANZ (1900), Sketch of the Kwakiutl language, *American Anthropology* 2: 108–21.

BOAS, FRANZ (1911), Kwakiutl, in *Handbook of American Indian Linguistics, Part 1*, BAE-B 40, 425–557.

BOAS, FRANZ (1947), Kwakiutl grammar with a glossary of the suffixes, *Transactions of the American Philosophical Society* 37: 202–377.

BOUMA, GOSSE, ROBERT MALOUF, and IVAN A. SAG (2001), Satisfying constraints on extraction and adjunction, *Natural Language And Linguistic Theory* 19: 1–65.

BRAITHWAITE, BEN (2003), Syntactic approaches to possessive constructions in Nuuchahnulth, in J.C. Brown and Michele Kalmar (eds.) *The 38th International Conference on Salish and Neighboring Languages*, 7–22.

BRESNAN, JOAN and JONNI KANERVA (1989), Locative inversion in chichewa: A case study in the factorization of grammar., *Linguistic Inquiry* 20: 1–50.

CARLSON, BARRY F. (1990), Compounding and lexical suffixation in Spokane, *Anthropological Linguistics* 32: 69–82.

CARLSON, BARRY F. and JOHN H. ESLING (2003), Phonetics and physiology of the historical shift of uvulars to pharyngeals in Nuuchahnulth (Nootka), *Journal of the International Phonetic Association* 33: 183–193.

CARLSON, BARRY F., JOHN H. ESLING, and KATIE FRASER (2001), Nuuchahnulth, *Journal of the International Phonetic Association* 31: 275–279.

CARLSON, BARRY F. and JOHN THOMAS (1979), The Nitinaht inferential, *Anthropological Linguistics* 21: 317–327.

CHOMSKY, NOAM (1981), *Lectures on Government and Binding*, Foris, Dordrecht.

CLARK, EVE V. and HERBERT H. CLARK (1979), When nouns surface as verbs, *Language* 55: 767–811.

COLARUSSO, JOHN (1985), Pharyngeals and pharyngealization in Salishan and Wakashan, *International Journal of American Linguistics* 51: 366–368.

COPESTAKE, ANN, DAN FLICKINGER, ROB MALOUF, SUSANNE RIEHEMANN, and IVAN SAG (1995), Translation using Minimal Recursion Semantics, in *Proceedings of the 6th International Conference on Theoretical and Methodological Issues in Machine Translation, Leuven.*

COPESTAKE, ANN, DAN FLICKINGER, IVAN SAG, and CARL POLLARD (1999), Minimal Recursion Semantics: An introduction, MS.

CRYSMANN, BERTHOLD (2002), *Constraint-based Coanalysis: Portuguese Cliticisation and Morphology-Syntax Interaction in HPSG*, Ph.D. thesis, Saarland University.

DAVIDSON, MATTHEW (2002), *Studies in Southern Wakashan (Nootkan) Grammar*, Ph.D. thesis, State University of New York, Buffalo.

DAVIS, ANTHONY R. (2001), *Linking by Types in the Hierarchical Lexicon*, CSLI Publications, Stanford, California.

DAVIS, HENRY and NAOMI SAWAI (2001), WH-movement as noun incorporation in Nuu-chah-nulth, in Karine Megerdoomian (ed.) *Proceedings of the 20th West Coast Conference on Formal Linguistics*, Cascadilla, Somerville, MA, 123–136.

DOWTY, DAVID (1991), Thematic proto-roles and argument selection, *Language* 67: 547–619.

EMANATIAN, MICHELE (1988), The Nootka passive revisited, in William Shipley (ed.) *In Honor of Mary Haas: From the Haas Festival Conference on Native American Linguistics*, Mouton de Gruyter, Berlin, 265–291.

FILLMORE, CHARLES J. (1977), The case for case reopened, in Peter Cole and Jerrold M. Sadock (eds.) *Grammatical Relations. Syntax and Semantics 8*, Academic Press, 59–81.

GAMBLE, GEOFFREY (1978), Nootkan glottalized resonants in Nitinat: A case of lexical diffusion, in William S-Y. Wang (ed.) *The Lexicon in Phonological Change*, Mouton, The Hague, 266–278.

GERDTS, DONNA and THOMAS E. HUKARI (2003), Doubling and denominal verbs: Evidence from Halkomelem Salish, paper presented at 29th Meeting of the Berkeley Linguistic Society.

GINZBURG, JONATHAN and IVAN SAG (2000), *Interrogative Investigations: The Form, Meaning and Use of English Interrogatives*, CSLI Publications, Stanford.

GRUBB, DAVID MCC. (1977), *A Practical Writing System and Short Dictionary of Kwakw'ala (Kwakiutl)*, National Museum of Man Mercury Series, Canadian Ethnology Service Paper no. 34, National Museums of Canada, Ottawa.

HAAS, MARY R. (1969), Internal reconstruction of the Nootka-Nitinat pronominal suffixes, *International Journal of American Linguistics* 35: 108–124.

HAAS, MARY R. (1972), The structure of stems and roots in Nootka-Nitinat, *International Journal of American Linguistics* 38: 83–92.

HAAS-SWADESH, MARY and MORRIS SWADESH (1933), A visit to another world, a Nitinaht text, *International Journal of American Linguistics* 7: 195–208.

HALPERN, AARON L. (ed.) (1995), *On the Placement and Morphology of Clitics*, CSLI Publications, Stanford, California.

HARLEY, HEIDI (2001), Measuring-out and the ontology of verb roots in English, paper presented at the Ben-University Workshop on Aspect, June 18–20, 2001.

HESS, THOMAS (1990), A note on Nitinaht numerals, *International Journal of American Linguistics* 56: 83–92.

HILTON, SUSANNE and JOHN C. RATH (eds.) (1982), *Oowekeeno Oral Traditions: As Told by the Late Chief Simon Walkus Sr.*, National Museum of Man Mercury Series, Canadian Ethnology Service Paper no. 84, National Museums of Canada, Ottawa.

HOFMANN, ERICA (1984), Intonation in Kyuquot: A scratch on the surface, *Working Papers of the Linguistic Circle of the University of Victoria* 4: 41–57.

HOWE, DARIN MATHEW (2000), *Oowekyala Segmental Phonology*, Ph.D. thesis, University of British Columbia.

HUKARI, THOMAS E. and ROBERT D. LEVINE (1996), Phrase Structure Grammar: the next generation, *Journal of Linguistics* 32: 465–496.

JACOBSEN, JR., WILLIAM H. (1969), Origin of the Nootka pharyngeals, *International Journal of American Linguistics* 35: 125–153.

JACOBSEN, JR., WILLIAM H. (1971), Makah vowel insertion and loss, in *6th International Conference on Salishan Languages.*

JACOBSEN, JR., WILLIAM H. (1973), The pattern of Makah pronouns, in *8th International Conference on Salishan Languages.*

JACOBSEN, JR., WILLIAM H. (1978), Makah vocative vocalism, in *13th International Conference on Salishan Languages.*

JACOBSEN, JR., WILLIAM H. (1979a), Noun and verb in Nootkan, in Barbara S. Efrat (ed.) *The Victoria Conference on Northwestern Languages (1976)*, Ministry of the Provincial Secretary, Victoria, BC, British Columbia Provincial Museum Heritage Record 4, 83–153.

JACOBSEN, JR., WILLIAM H. (1979b), Wakashan comparative studies, in Lyle Campbell and Mariann Mithun (eds.) *The Languages of Native America: Historical and Comparative Assessment*, University of Texas Press, Austin, TX, 766–791.

JACOBSEN, JR., WILLIAM H. (1979, 1995), *First Lessons in Makah*, Makah Cultural & Research Center, Neah Bay, WA.

JACOBSEN, JR., WILLIAM H. (1986), The heterogeneity of evidentials in Makah, in Wallace Chafe (ed.) *Evidentiality: The Linguistic Coding of Epistemology*, Ablex, Norwood, NJ, Advances in Discourse Processes, vol. 20, 3–28.

JACOBSEN, JR., WILLIAM H. (1993), Subordination and cosubordination in Nootka: Clause combining in a polysynthetic verb-initial language, in Robert D. Van Valin Jr. (ed.) *Advances in Role and Reference Grammar*, John Benjamins, Amsterdam, Amsterdam Studies in the Theory and History of Linguistic Science IV: Current Issues in Linguistic Theory, vol. 82, 235–274.

JELINEK, ELOISE and RICHARD A. DEMERS (1983), The agent hierarchy and voice in some Coast Salish languags, *International Journal of American Linguistics* 49: 167–85.

JOHNS, ALANA (2003), Restricting noun incorporation, MS.

KALMAR, MICHELE (2003), *Patterns of Reduplication in Kwak'wala*, Master's thesis, University of British Columbia.

KATHOL, ANDREAS (2000), *Linear Syntax*, Oxford University Press, Oxford.

KAY, PAUL and CHARLES J. FILLMORE (1999), Grammatical constructions and linguistic generalizations: The *what's x doing y?* construction, *Language* 75: 1–33.

KIM, EUN-SOOK (2000), Glottalization in Nuu-chah-nulth (Nootka): A module interaction case, in Suzanne Gessner and Sunyoung Oh (eds.) *The 35th International Conference on Salish and Neighboring Languages*, University of British Columbia Working Papers in Linguistics, vol. 3, 107–117.

KIM, EUN-SOOK (2001), Glottalization in Southern Wakashan: a comparative study, in Leora Bar-el, Linda Tamburri Watt, and Ian Wilson (eds.) *The 36th International Conference on Salish and Neighboring Languages*, University of British Columbia Working Papers in Linguistics, vol. 6, 175–188.

KIM, EUN-SOOK and RACHEL WOJDAK (2002), A survey of Nuu-chah-nulth reduplication, in Carrie Gillon, Naomi Sawai, and Rachel Wojdak (eds.) *The 37th International Conference on Salish and Neighboring Languages*, University of British Columbia Working Papers in Linguistics, vol. 9, 189–202.

KINKADE, M. DALE (1969), Lexical suffixes in Mosan languages, in *Conference on American Indian Languages 8*, New Orleans.

KINKADE, M. DALE (1985), More on nasal loss on the Northwest Coast, *International Journal of American Linguistics* 51: 478–480.

KLOKEID, TERRY J. (1968), Linguistic acculturation in Nitinaht, in *3rd International Conference on Salishan Languages.*

KLOKEID, TERRY J. (1970), Output restraints on Nitinaht auxilliaries, in *5th International Conference on Salishan Languages.*

KLOKEID, TERRY J. (1974), Output conditions, semantic interpretation, and Nitinaht auxiliaries, in *9th International Conference on Salishan Languages.*

KLOKEID, TERRY J. (1976), The syntax of prepositions in Nitinaht, in *Rocky Mountain Linguistics Association.*

KLOKEID, TERRY J. (1977a), The Nitinat feature system: A reference paper, in Robert St. Clair (ed.) *Papers from the 10th International Conference on Salishan Languages (1975)*, University of Louisville Press, Louisville, KY, Lektos Special Issue, 81–95.

KLOKEID, TERRY J. (1977b), Output conditions, semantic interpretation, and Nitinat auxiliaries, in *Papers from the 9th International Conference on Salishan Languages (1974)*, University of British Columbia Press, Vancouver, BC, 168–195.

KLOKEID, TERRY J. (1978a), Surface structure constraints and Nitinaht enclitics, in Eung-Do Cook and Jonathan Kaye (eds.) *Linguistic Studies of Native Canada*, University of British Columbia Press, Vancouver, BC, 157–176.

KLOKEID, TERRY J. (1978b), Syntactic and conceptual relations in Nitinat, in *12th International Conference on Salishan Languages (1977)*, Colville Federated Tribes, Colville, WA, 1–68.

KOENIG, JEAN-PIERRE (1999), *Lexical Relations*, CSLI Publications, Stanford, CA.

KOENIG, JEAN-PIERRE and ANTHONY R. DAVIS (2001), Sublexical modality and the structure of lexical semantic representations, *Linguistics and Philosophy* 24: 71–124.

KROEBER, A. L. (1909), Noun incorporation in American linguistics, *Verhandlungen der XVI. amerikanisten Kongress* 568–576.

LEVINE, ROBERT D. (1977), Kwak'wala, *International Journal of American Linguistics Native American Texts Series* 2: 98–126.

LEVINE, ROBERT D. (1980), On the lexical origin of the Kwakwala passive, *International Journal of American Linguistics* 46: 240–258.

LEVINE, ROBERT D. (1981), Passives and controllability in Kwakwala, *Glossa* 14: 139–167.

LINCOLN, NEVILLE J. and JOHN C. RATH (1986), *Phonology, Dictionary and Listing of Roots and Lexical Derivates of the Haisla Language of Kitlope and Kitimaat, B.C.*, Canadian Museum of Civilization Mercury Series, Canadian Ethnology Service Paper no. 103, National Museums of Canada, Ottawa.

LINCOLN, NEVILLE J., JOHN C. RATH, and EVELYN WINDSOR (1990), Bax^{w}bak^{w}alanusiwa: a Haisla story as told by Gordon Robertson, *Amerindia* 14.

LITTLE, CAROLINE (2003), *Caroline Little's Nuu-chah-nulth (Ahousaht) Texts with Grammatical Analysis*, Edited by Toshihide Nakayama, Endangered Languages of the Pacific Rim A2-027, Osaka.

LOUIE, GEORGE (2003), *George Louie's Nuu-chah-nulth (Ahousaht) Texts with Grammatical Analysis*, Edited by Toshihide Nakayama. Endangered Languages of the Pacific Rim A2-02,, Osaka.

MALOUF, ROBERT (1999), West-Greenlandic noun incorporation in a monohierarchical theory of grammar, in Gert Webelhuth, Jean-Pierre Koenig, and Andreas Kathol (eds.) *Lexical and Constructional Aspects of Linguistic Explanation*, CSLI Publications, Stanford, California, 47–62.

MANNING, CHRISTOPHER D. and IVAN A. SAG (1999), Dissociations between ARG-ST and grammatical relations, in Gert Webelhuth, Jean-Pierre Koenig, and Andreas Kathol (eds.) *Lexical and Constructional Aspects of Linguistic Explanation*, CSLI Publications, 63–78.

MEURERS, WALT DETMAR (1995), Towards a semantics of lexical rules as used in HPSG, paper presented at the Conference on Formal Grammar, Barcelona, Spain.

MILLER, PHILIP H. (1992), *Clitics and Constituents in Phrase Structure Grammar*, Garland, New York.

MITHUN, MARIANNE (1984), The evolution of noun incorporation, *Language* 60: 847–894.

MITHUN, MARIANNE (1986), On the nature of noun incorporation, *Language* 62: 32–37.

MITHUN, MARIANNE (1997), Lexical affixes and morphological typology, in Joan Bybee, J. Haiman, and S. Thompson (eds.) *Essays on Language Function and Language Type*, John Benjamins, Amsterdam, 357–371.

MITHUN, MARIANNE (1999), *The Languages of Native North America*, Cambridge University Press, Cambridge.

NAKAYAMA, TOSHIHIDE (1993), On the behavior of suffixes in Nuuchahnulth, in *28th International Conference on Salish and Neighboring Languages.*

NAKAYAMA, TOSHIHIDE (1997), Functions of the Nootka (Nuu-chah-nulth) 'passive' suffix, *International Journal of American Linguistics* 63: 412–431, 0020-7071.

NAKAYAMA, TOSHIHIDE (2001), *Nuuchahnulth (Nootka) Morphosyntax*, University of California Publications in Linguistics, vol. 134, University of California Press, Berkeley, CA.

NORRIS, MARY JANE (1998), Canada's aboriginal languages, *Canadian Social Trends* 51: 8–16.

NUUCHAHNULTH TRIBAL COUNCIL (1991), *Our World - Our Ways: T'aat'aaqsapa Cultural Dictionary*, Compiled and Edited by Jay Powell, Learning T'aat'aaqsapa Series, Nuuchahnulth Tribal Council.

PAIK, TAI SHUNG (1968), *Clayoquot Phonology*, Master's thesis, University of Washington.

POLLARD, CARL and IVAN A. SAG (1987), *Information-Based Syntax and Semantics*, CSLI, Stanford.

POLLARD, CARL and IVAN A. SAG (1994), *Head-Driven Phrase Structure Grammar*, University of Chicago Press, Chicago.

RATH, JOHN C. (1977), On the phonological description of the Heiltsuk language, in *Dutch Contributions to the 9th International Conference on Salish Languages*, University of Leiden, Leiden, 39–75.

RATH, JOHN C. (1981), *A Practical Heiltsuk-English Dictionary: with a Grammatical Introduction*, National Museum of Man Mercury Series, Canadian Ethnology Service Paper no. 75, National Museums of Canada, Ottawa.

RATH, JOHN C. (1984), The word-classes of Upper North Wakashan, *Working Papers of the Linguistic Circle of the University of Victoria* 4: 318–323.

REAPE, MIKE (1993), *A Formal Theory of Word Order: A Case Study in West Germanic*, Ph.D. thesis, University of Edinburgh.

RENKER, ANN M. (1987), *Rethinking noun and verb: An investigation of AUX in a Southern Wakashan language*, Ph.D. thesis, The American University.

RIEHEMANN, SUZANNE Z. (1993), Word formation in lexical type hierarchies: A case study of *bar*-adjectives in German, sfS-Report-02-93, University of Tübingen.

RIEHEMANN, SUZANNE Z. (1998), Type-based derivational morphology, *Journal of Comparative Germanic Linguistics* 2.

RIEHEMANN, SUZANNE Z. (2001), *A Constructional Approach to Idioms and Word Formation*, Ph.D. thesis, Stanford University.

ROSE, SUZANNE M. (1979), Phonetic aspects of Nootka pharyngeals, in *Papers from the 14th International Conference on Salishan Languages*, Western Washington University, Bellingham, WA, 31–58.

ROSE, SUZANNE M. (1981), *Kyuquot Grammar*, Ph.D. thesis, University of Victoria.

ROSE, SUZANNE M. and BARRY CARLSON (1984), The Nootka-Nitinaht passive, *Anthropological Linguistics* 26: 1–12.

ROSEN, SARA THOMAS (1989), Two types of noun incorporation: A lexical analysis, *Language* 65: 294–317.

SADOCK, JERROLD M. (1980), Noun incorporation in Greenlandic: A case of syntactic word formation, *Language* 56: 300–319.

SADOCK, JERROLD M. (1985), Autolexical syntax: A theory of noun incorporation and similar phenomena, *Natural Language and Linguistic Theory* 3: 379–440.

SADOCK, JERROLD M. (1986), Some notes on noun incorporation, *Language* 62: 19–31.

SADOCK, JERROLD M. (1991), *Autolexical Syntax: A Theory of Parallel Grammatical Representations*, University of Chicago Press, Chicago.

SAG, IVAN A. (1987), Grammatical hierarchy and linear precedence, in *Syntax and Semantics, Vol. 20. Discontinuous Constituents*, Academic Press.

SAG, IVAN A. (1997), English relative clause constructions, *Journal of Linguistics* 33: 431–484.

SAG, IVAN A. and THOMAS WASOW (1999), *Syntactic Theory: a Formal Introduction*, CSLI Publications, Stanford, California.

SAPIR, EDWARD (1911a), The problem of noun incorporation in American languages, *American Anthropologist* 13: 250–282.

SAPIR, EDWARD (1911b), Some aspects of Nootka language and culture, *American Anthropology* 13: 15–28.

SAPIR, EDWARD (1924), The Rival Whalers, a Nitinat story (Nootka text with translation and grammatical analysis, *International Journal of American Linguistics* 3: 76–102.

SAPIR, EDWARD (1938), Glottalized continuants in Navaho, Nootka and Kwakiutl (with a note on Indo-European), *Language* 14: 248–74.

SAPIR, EDWARD and MORRIS SWADESH (1939), *Nootka Texts: Tales and Ethnological Narratives: With Grammatical Notes and Lexical Materials*, Linguistic Society of America, Philadelphia.

SAPIR, EDWARD and MORRIS SWADESH (1955), Native accounts of Nootka ethnography, *International Journal of American Linguistics* 21: part 2.

SAPIR, EDWARD, MORRIS SWADESH, ALEXANDER THOMAS, JOHN THOMAS, and FRANK WILLIAMS (2000), *The Whaling Indians: Tales of Extraordinary Experience*, Part 10 of the Sapir-Thomas Nootka Texts, Edited by Eugene Arima and Terry J. Klokeid and Katherine Robinson, Canadian Museum of Civilization Mercury Series CANES 134, Ottawa.

SAPIR, EDWARD, MORRIS SWADESH, ALEXANDER THOMAS, JOHN THOMAS, and FRANK WILLIAMS (2004), *The Whaling Indians: Legendary Hunters*, Part 9 of the Sapir-Thomas Nootka Texts, Edited by Eugene Arima, Terry J. Klokeid, and Katherine Robinson, Canadian Museum of Civilization Mercury Series Ethnology Paper 139, Ottawa.

SHANK, SCOTT and IAN WILSON (2000), Acoustic evidence for ʕ as a glottalized pharyngeal glide in Nuu-chah-nulth, in Suzanne Gessner and Sunyoung Oh (eds.) *The 35th International Conference on Salish and Neighboring Languages*, University of British Columbia Working Papers in Linguistics, vol. 3, 185–197.

SMITH, LAWRENCE R. (1978), *A Survey of the Derivational Postbases of Labrador Inuttut (Eskimo)*, National Museum of Man Mercury Series, Canadian Ethnology Service Paper no. 45, National Museums of Canada, Ottawa.

STONHAM, JOHN (1990), *Current Issues in Morphological Theory*, Ph.D. thesis, Stanford University.

STONHAM, JOHN (1994), All moras are not created equal, *Cahiers Linguistiques d' Ottawa* 21: 1–25.

STONHAM, JOHN (1999), *Aspects of Tsishaath Nootka Phonetics and Phonology*, LINCOM Europa, Munich.

STONHAM, JOHN (2003), Southern Wakashan double reduplication, in *Papers from the 38th International Conference on Salishan Languages.*

SWADESH, MORRIS (1933), *The Internal Economy of the Nootka Word*, Ph.D. thesis, Yale University.

SWADESH, MORRIS (1939), Nootka internal syntax, *International Journal of American Linguistics* 9: 78–102.

SWADESH, MORRIS (1948), A structural trend in Nootka, *Word* 4: 106–119.

SWADESH, MORRIS (1953a), Mosan I: A problem of remote common origin, *International Journal of American Linguistics* 19: 26–44.

SWADESH, MORRIS (1953b), Mosan II: Comparative vocabularies, *International Journal of American Linguistics* 19: 223–36.

THOMAS, JOHN TL'IISHAL and THOM HESS (1981), *An Introduction to Nitinaht Language and Culture.*

TOUCHIE, BERNICE (1977), Nitinaht, *International Journal of American Linguistics Native American Texts Series* 2: 69–97.

VAN GEENHOVEN, VEERLE (1996), Semantic incorporation and indefinite descriptions: Semantic and syntactic aspects of noun incorporation in west greenlandic, sfS-Report-03-96.

VAN GEENHOVEN, VEERLE (1998a), On the argument structure of some noun incorporating verbs in West Greenlandic, in Miriam Butt and Wilhelm Geuder (eds.) *The Projection of Arguments*, CSLI Publications, Stanford, California, 225–263.

VAN GEENHOVEN, VEERLE (1998b), *Semantic Incorporation and Indefinite Descriptions: Semantic and Syntactic Aspects of Noun Incorporation in West Greenlandic*, CSLI Publications, Stanford, California.

VAN GEENHOVEN, VEERLE (2002), Raised possessors and noun incorporation in West Greenlandic, *Natural Language and Linguistic Theory* 20: 759–821.

VINK, HEIN (1978), A Haisla phonology, in *12th International Conference on Salishan Languages*, Colville Federated Tribes, Colville, WA, 111–131.

WECHSLER, STEPHEN (1999), HPSG, GB, and the Balinese bind, in Gert Webelhuth, Jean-Pierre Koenig, and Andreas Kathol (eds.) *Lexical and Constructional Aspects of Linguistic Explanation*, CSLI Publications, 179–195.

WECHSLER, STEPHEN and I WAYAN ARKA (1998), Syntactic ergativity in Balinese: an argument structure based theory, *Natural Language And Linguistic Theory* 16: 387–441.

WERLE, ADAM (2002), The Southern Wakashan one-foot word, in Carrie Gillon, Naomi Sawai, and Rachel Wojdak (eds.) *The 37th International Conference on Salish and Neighboring Languages*, University of British Columbia Working Papers in Linguistics, vol. 9, 382–397.

WHISTLER, KENNETH W. (1985), Focus, perspective, and inverse person marking in Nootkan, in Johanna Nichols (ed.) *Grammar Inside and Outside the Clause: Some Approaches to Theory from the Field*, Cambridge University Press, Cambridge, 227–265.

WOJDAK, RACHEL (2001), An argument for category neutrality?, in Karine Megerdoomian and Leora Bar-el (eds.) *Proceedings of the 20th West Coast Conference on Formal Linguistics*, Cascadilla, Somerville, MA, 621–634.

WOJDAK, RACHEL (2003a), PF incorporation: Evidence from Wakashan, paper presented at 26th GLOW Colloquium, Lund.

WOJDAK, RACHEL (2003b), PF incorporation in Nuu-chah-nulth, paper presented at CLA 2003, Halifax.

WOJDAK, RACHEL (2003c), Predicative lexical suffixes in Nuu-chah-nulth, in J.C. Brown and Michele Kalmar (eds.) *The 38th International Conference on Salish and Neighboring Languages*, 275–289.

YIU, WINNIE and JOHN STONHAM (2002), The nature of Nuuchahnulth classifiers, in Carrie Gillon, Naomi Sawai, and Rachel Wojdak (eds.) *The 37th International Conference on Salish and Neighboring Languages*, 417–437.

ZWICKY, ARNOLD M. and GEOFFREY K. PULLUM (1983), Cliticization vs. inflection: English *n't*, *Language* 59: 502–513.