SELECTION AND BLOCKING IN THE NORTHEAST DENE VERB

Alessandro Jaker

Alaska Native Language Center

Abstract[1]

Dene (Athabaskan) verbs are famous both for their highly complex morphophonemics, and for their often complex, idiosyncratic, and/or discontinuous morphological dependencies. The latter refers mainly to selection and blocking restrictions: two morphemes, in different positions in the verbal template, are either forbidden from appearing together on the surface (blocking), or one morpheme requires the presence of another morpheme (selection). This paper will show how both positive and negative *constraining equations* (Bresnan 2001, Dalrymple 2001) within LFG may be used to capture these effects. Data are taken from the Wıılıìdeh and Tetsǫ́t'ıné languages, based on the author's own fieldwork.

1.0 Introduction: the Dene Verbal Template[2]

The Dene (Athabaskan) language family is one of the largest language families in North America, spoken in Alaska, the Yukon Territory, Northwest Territories, British Columbia, Alberta, Saskatchewan, Manitoba, Oregon, California, and the American Southwest. These languages have long been famous both for their highly complex morphophonemics, as well as for their often complex, idiosyncratic, and/or discontinuous morphological dependencies. The data in this paper will be taken primarily from Tetsǫ́t'ıné or Yellowknife, a dialect of Dëne Sųłıné spoken in Dettah, Ndılǫ, Łútsëlk'é, Denínu Kuę́, and Deschaghé, Northwest Territories, Canada, based on my own fieldwork; additional examples will also be taken from the Wıılıìdeh, a dialect of the Tłıchǫ (Dogrib) language, spoken in Dettah and Ndılǫ-- examples are from Tetsǫ́t'ıné unless otherwise specified. Both of these languages belong to the subgroup termed Northeast Dene or Northeast Athapaskan (Ackroyd 1976). Both of these languages exhibit morphological selection and blocking restrictions: two morphemes, in different positions in the verbal template, are either forbidden from appearing together on the surface (blocking), or one morpheme requires the presence of another morpheme (selection). This paper will show how both positive and negative *constraining equations* (Bresnan 2001, Dalrymple 2001) within LFG may be used to capture these effects.

---

[2] List of abbreviations used: ACC—accomplishment, ACH—achievement, ACT—activity, ADV—adverbial, ASP—aspect, CAUS—causative, CONT—continuative, IMP—imperfective, IMPRS—impersonal MID—middle, OBJ—object, OBL—oblique, OPT—optative, PERAMB—perambulative, PERF—perfective, REFL—reflexive, SEM—semelfactive, SUBJ—subject, VPT—viewpoint.

It is traditionally assumed that the prefixes of the Dene verb are organized into a series of positions called a *template* (Hoijer 1945, Kari 1989). Specifically, I assume the template model in (1), originally proposed for Slave (Rice 1989), for all of the NE Dene languages.

(1) Template model of NE Dene verb structure
preverb$_1$ – distributive$_2$ – iterative$_3$ – incorporate$_4$ – number$_5$ – object$_6$ – deictic subject$_7$ – qualifier$_8$ – aspect$_9$ – conjugation$_{10}$ – mode$_{11}$ – subject$_{12}$ – classifier$_{13}$ – root

This paper will restrict itself to those selectional effects in positions 10-13 of the verbal template, as represented schematically in (2). Note that the direction of the arrows represents the direction of selection.

(2) Selectional effects in positions 10-13 of NE Dene Verbal Template

conjugation$_{10}$ – mode$_{11}$ – subject$_{12}$ – classifier$_{13}$ – root
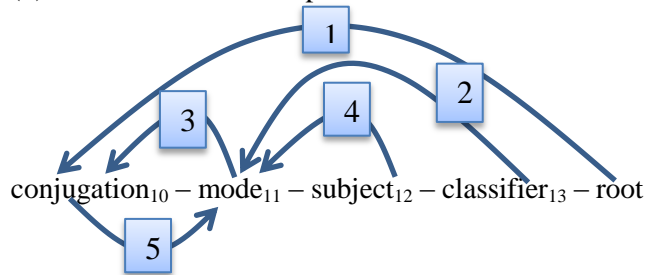
The terms used in (1) and (2) are the traditional names given to these template positions in the Athabaskanist literature (e.g. Hoijer 1945, Li 1946). Terms such as 'conjugation' and 'classifier' reflect the older view that the prefixes in these positions designate arbitrary verb classes, with little or no semantic contribution. More recently, these prefix positions have been re-analyzed as semantically meaningful, most notably in the work of Rice (2000). Thus, 'conjugation' (position 10) is re-analyzed as *situation aspect* (Rice 2000: 251-281), distinguishing the categories *accomplishment, achievement, activity,* and *semelfactive*. 'Mode' (position 11) is re-analyzed as *viewpoint aspect*, distinguishing the categories *perfective, imperfective,* and *optative* (Rice 2000: 246-251). Finally, the 'classifier' (position 13) is re-interpreted as a *voice/valence* marker (Rice 2000: 126-169), which distinguishes the categories *active voice, middle voice,* and *causative* or *causative-middle*.

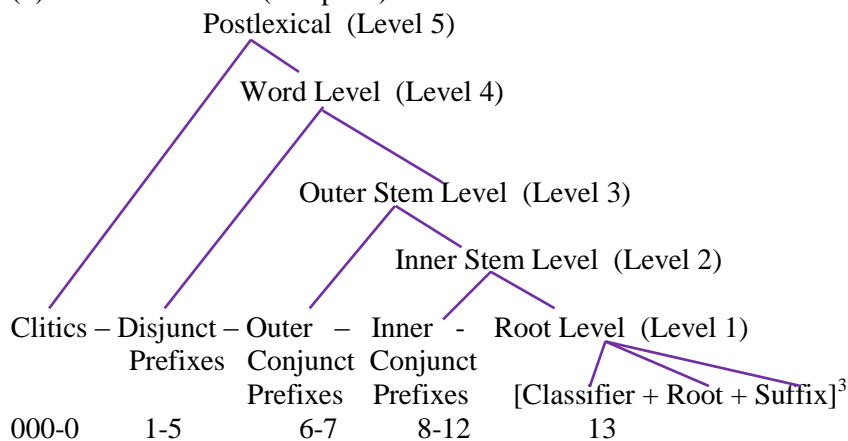While all of these categories are *a priori* logically independent of each-other, in Dene languages the prefixes which contribute this morphosyntactic information enter into complex interdependencies with each-other, as suggested by the arrows in (2). For example, the presence of a middle voice marker in position 13 blocks the perfective viewpoint aspect marker *ne* in position 11. In some cases, different prefix positions can

mutually constrain each other, as is the case with positions 10 and 11 (see §4.1). The goal of this paper is to elaborate upon the selectional patterns suggested in (2), and formalize them in an LFG framework, using constraining equations.

2.0 Lexical Phonology and the Dene Verb

While the templatic representations above are suggestive of a sort of 'flat' structure, it was noted early on that the positions in (1) also seem to have some sort of internal constituency, at least from a phonological perspective. Fang-Kuei Li (1946) first used the terms *conjunctive* and *disjunctive* to describe this constituency, along with a third class of 'in-between' prefixes which seemed to fall into neither group. In later work, within the framework of Lexical Phonology (Kiparsky 1982, 1985), the distinction between conjunct and disjunct prefixes was re-interpreted as corresponding to Stem Level and Word Level, respectively (Rice 1982, 1989; Hargus 1988, Jaker 2012, 2013a). This synthesis of the template model with Lexical Phonology is referred to as the Stem-Core model (Halpern 1992), or else the "Hargus model," as illustrated in (3).

(3) Stem-core model (complete)

Postlexical (Level 5)

Word Level (Level 4)

Outer Stem Level (Level 3)

Inner Stem Level (Level 2)

Clitics –	Disjunct –	Outer –	Inner -	Root Level (Level 1)
	Prefixes	Conjunct	Conjunct	
		Prefixes	Prefixes	[Classifier + Root + Suffix][3]
000-0	1-5	6-7	8-12	13

---

[3] Suffixes in Dene langauges historically included -*ł* (progressive, negative perfective), -*χ* (reversative), -*k* (repetitive-customary), -*x* (semelfactive non-perfective), and -*t* (semelfactive perfective) (Leer 1979). While this system of suffixation is still productive in some Dene languages, in others it has either been lost entirely, or the suffixes have fused with the stem to yield different stem allomorphs (i.e. 'ablaut'). For the purposes of this paper, I assume that suffixes do not directly contribute to f-structure, but rather are selected by the f-structures introduced by other prefixes. In other words, suffixes are listed only with constraining equations, not defining equations.

The representation in (3) is still templatic in the sense that affix ordering is not determined by any independently motivated syntactic or semantic princniples (Nordlinger 2010), and derivation is interleaved with inflection. However, the same representation is also layered (Simpson & Withgott 1986), in the sense that the word is built inside-out from the root, in a series of levels or strata, with different sets of phonological rules applying to each stratum.

From an LFG perspective, it is important to note that Lexical Phonology is a "lexical-incremental" theory of morphology (Stump 2001). This means that both phonological forms and grammatical features are introduced by morphemes, where each morpheme projects a partial f-structure via the ϕ-function (Bresnan 2001, Dalrymple 2001). The layered structure of Lexical Phonology also has implications for the way in which f-structures are built up in LFG. According to the Bracket Erasure Convention, separate morphemes in the input are fused into larger units at the end of each cycle (Pesetsky 1979, Kiparsky 1982). The f-structures projected by these morphemes are then combined via unification (Sells 1995, Nordlinger 1997). To illustrate, let us consider the imperfective or optative stem of the verb 'cook', in Tetsǫ́t'ıné, *łt'éth*. This stem is derived from the root *t'eth* 'cook', *ł-* 'causative', and a floating High tone suffix, as shown in (4a-c).

(4a) Input to Level 1: 3 separate morphemes: /ł- t'eth -H/

ł: V_{Prefix} – Level 1   **t'eth:** V_{Root} – Level 1
       @CAUSATIVE   ($\uparrow$ PRED) = 'cook <SUBJ>'

H: V_{Suffix} – Level 1
       ($\uparrow$ ASP VPT) $=_c$ IMP $\vee$ OPT

(4b) Output of Level 1: a phonological form and an f-structure.

łt'éth $\xrightarrow{\phi}$ [PRED 'cook <SUBJ, OBJ>']

(4c) Input to Level 2: a single, more complex morpheme: /łt'éth/
łt'éth: V_{Stem} – Level 2
                 ($\uparrow$ PRED) = 'cook <SUBJ, OBJ>'
                 ($\uparrow$ ASP VPT) $=_c$ IMP $\vee$ OPT

In the lexical entry for *ł-* 'causative', I assume the formal device of *templates* in LFG (Dalrymple, Kaplan, and King 2004; Asudeh, Dalrymple, and Toivonen 2013). That is, the template @CAUSATIVE designates a collection of equations which add an argument to either an intransitive or transitive verb. Thus we see that while the input in (4a) contains an intransitive root and a causativizing prefix, the output consists of a transitive stem, which projects a partial f-structure via the ϕ-function in (4b). This

output then becomes the basis of a new lexical entry in (4c), which combines all of the defining and constraining equations in (4a), via unification. I assume that this process of bracket erasure and unification proceeds through all 5 levels of the derivation, as shown in (3). If, at any point in the derivation, coherence or negative constraining equations are violated, the derivation will crash. However, if completeness is not satisfied, or positive constraining equations are not satisfied, the derivation will not crash, because these are evaluated only for complete utterances, not partial f-structures. For example, the constraining equation in (4a) requires the f-structure in (4b) to have either imperfective or optative viewpoint aspect, which it does not. However, this feature may be introduced at a later level, by a prefix such as *ghu* 'optative', as in (5a-b).

(5a) Input to Level 2: Optative prefix plus IMP/OPT stem: /ghu-ɬt'éth/

ghu: V$_{Prefix}$ – Level 2   **ɬt'éth:**   V$_{Stem}$ – Level 2
            ($\uparrow$ ASP VPT) = OPT   ($\uparrow$ PRED) = 'cook <SUBJ, OBJ>'
                                        ($\uparrow$ ASP VPT) $=_c$ IMP $\vee$ OPT

(5b) Output of Level 2: phonological form and f-structure

ϕ

ghult'éth $\longrightarrow$
$$\begin{bmatrix} \text{PRED} & \text{'cook <SUBJ, OBJ>'} \\ \text{ASP} & [\text{VPT} \quad \text{OPT}] \end{bmatrix}$$

      To summarize, violations of coherence, or negative existential equations, cause a derivation to crash immediately, because there is no way for the derivation to recover. On the other hand, violations of completeness or positive constraining equations do not end a derivation, because they may be satisfied by affixes or other material elsewhere in the structure—hence, these cannot crash a derivation until the entire structure is processed.

3.0 Voice/valence and perfectivity interactions.
3.1 Data.
      The Athabaskanist literature traditionally recognizes four classifiers: *d, l, ł,* and Ø (e.g. Rice 1989). These contribute the semantics of middle voice, causative-middle, causative, and active voice, respectively (Rice 2000: 142-164). The main descriptive generalization to be presented in this section is that the perfective marker *ne* occurs only in Ø/*ł*-classifier verbs, but not *d/l*-classifier verbs. Where *ne* is blocked, a Ø-allomorph of the perfective is used instead to express perfective meaning, as shown in (6).

(6) Classifiers select perfective allomorph.

$$\text{conjugation}_{10} - \text{mode}_{11} - \text{subject}_{12} - \text{classifier}_{13} - \text{root}$$

with **ne** and **Ø/ł** (upper arrow), **Ø** and **d/l** (lower arrow)
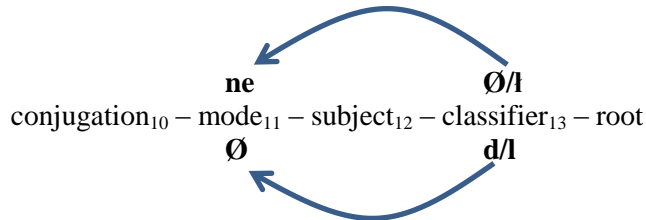
The *d-* and *l-*classifiers both contribute *middle voice* (Rice 2000: 142-164). Historically, it is likely that the pattern in (6) arose because perfectivity was left unspecified in middle voice verbs (Hopper & Thompson 1980). Synchronically, however, it is best regarded as an arbitrary allomorph selection pattern. (7) and (8) present the perfective paradigms of Ø- and *l-*classifier verbs, where *ne* occurs in the perfective.

(7a) Perfective of *hetsagh* 'cry,' surface forms (Ø-classifier).

	singular	dual/plural
1st person	hɪtságh	hítságh
2nd person	hɪtság	huhtságh
3rd person	hɪtság	hʊ̜tságh
Impersonal	ts'ʊ̜tságh	

(7b) Perfective of *hetsagh* 'cry,' underlying forms (Ø-classifier).

	singular	dual/plural
1st	/ɪ-tságh/ 12-stem 1sgS.PERF-cry.PERF	/ghe-Ø-híd-tságh/ 10-11-12-stem ACT-PERF-1plS-cry.PERF
2nd	/ghe-**ne**-ne-tságh/ 10-**11**-12-stem ACT-**PERF**-2sgS-cry.PERF	/ghe-Ø-uh-tságh/ 10-11-12-stem ACT-PERF-2plS-cry.PERF
3rd	/ghe-**ne**-tságh/ 10-**11**-stem ACT-**PERF**-cry.PERF	/he-ghe-**ne**-tságh/ 7-10-**11**-stem 3plS-ACT-**PERF**-cry.PERF
Imprs	/ts'e-ghe-**ne**-tságh/ 7-10-**11**-stem IMPRSS-ACT-**PERF**-cry.PERF	

(8a) Perfective of *łaałthır* 'kill one animal,' surface forms (*ł*-classifier).

	singular	dual/plural
1st person	łaıłthër	łaíldhër
2nd person	łaɹłthër	łaułthër
3rd person	łaɹłthër	łahųłthër
Impersonal	łats'ųłthër	

(8b) Perfective of *łaałthır* 'kill one animal,' underlying forms (*ł*-classifier).

	singular	dual/plural
1st	/ła-ı-**ł**-thër/ 1-12-**13**-stem ADV-1sgS.PERF-**CAUS**-die.PERF	/ła-ghe-Ø-híd-**ł**-thër/ 1-10-11-12-**13**-stem ADV-ACT-PERF-1plS-**CAUS**-die.PERF
2nd	/ła-ghe-**ne**-ne-**ł**-thër/ 1-10-**11**-12-**13**-stem ADV-ACT-**PERF**-2sgS-**CAUS**-die.PERF	/ła-ghe-Ø-uh-**ł**-thër/ 1-10-11-12-**13**-stem ADV-ACT-PERF-2plS-**CAUS**-die.PERF
3rd	/ła-ghe-**ne-ł**-thër/ 1-10-**11-13**-stem ADV-ACT-**PERF-CAUS**-die.PERF	/ła-he-ghe-**ne-ł**-thër/ 1-7-10-**11-13**-stem ADV-3plS-ACT-**PERF-CAUS**-die.PERF
Imprs	/ła-ts'e-ghe-**ne-ł**-thër/ 1-7-10-**11-13**-stem ADV-IMPRSS-ACT-**PERF-CAUS-**die.PERF	

In (7) and (8) we see that, in Ø/*ł*-classifier verbs, the perfective prefix *ne* appears in position 11, in the 2sg, 3sg, 3du/pl, and impersonal forms. In the other forms, *ne* is absent for historical phonological reasons (Jaker 2012), and a Ø-allomorph of the perfective is used instead. However, in *d/l*-classifier verbs, *ne* is not present in any of the forms, as shown in (9) and (10).

(9a) Perfective of *hejën* 'sing,' surface forms (*d*-classifier).

	singular	dual/plural
1st person	hesjën	híjën
2nd person	hɹjën	huhjën
3rd person	hejën	heejën
Impersonal	ts'eejën	

(9b) Perfective of *hejën* 'sing,' underlying forms (*d*-classifier).

	singular	dual/plural
1st person	/ghe-**Ø**-s-**d**-shën/ 10-**11**-12-**13**-stem ACT-**PERF**-1sgS-**MID**-sing	/ghe-**Ø**-híd-**d**-shën/ 10-**11**-12-13-stem ACT-**PERF**-1plS-**MID**-sing

2nd person	/ghe-**Ø-**ne-**d**-shën/	/ghe-**Ø-**uh-**d**-shën/
	10-**11**-12-**13**-stem	10-**11**-12-**13**-stem
	ACT-**PERF**-2sgS-**MID**-sing	ACT-**PERF**-2plS-**MID**-sing
3rd person	/ghe-**Ø-d-**shën/	/he-ghe-**Ø-d-**shën/
	10-**11-13-**stem	7-10-**11-13-**stem
	ACT-**PERF-MID-**sing	3plS-ACT-**PERF-MID-**sing
Impersonal	/ts'e-ghe-**Ø-d-**shën/	
	7-10-**11-13-**stem	
	IMPRSS-ACT-**PERF-MID-**sing	

(10a) Perfective of *dek'enáaltsıl* 'wash one's self,' surface forms (*l*-classifier)

	singular	dual/plural
1st person	dek'enáastsël	dek'enáíltsël
2nd person	dek'enáḷtsël	dek'enáuɬtsël
3rd person	dek'enáaltsël	dek'enáheeltsël
Impersonal	dek'enáts'eeltsël	

(10b) Perf. of *dek'enáaltsıl* 'wash one's self,' underlying forms (*l*-classifier).

	singular	dual/plural
1st	/de-k'e-ná-ghe-**Ø-**s-**l-**tsël/	/de-k'e-ná-ghe-**Ø-**híd-**l-**tsël/
	0-1-1-10-**11**-12-**13**-stem	0-1-1-10-**11**-12-**13**-stem
	REFLO-PERAMB-CONT-ACT-**PERF-**	REFLO-PERAMB-CONT-ACT-**PERF-**
	1sgS-**CAUS.MID-**wet.PERF	1plS-**CAUS.MID-**wet.PERF
2nd	/de-k'e-ná-ghe-**Ø-**ne-**l-**tsël/	/de-k'e-ná-ghe-**Ø-**uh-**l-**tsël/
	0-1-1-10-**11**-12-**13**-stem	0-1-1-10-**11**-12-**13**-stem
	REFLO-PERAMB-CONT-ACT-**PERF-**	REFLO-PERAMB-CONT-ACT-**PERF-**
	2sgS-**CAUS.MID-**wet.PERF	2plS-**CAUS.MID-**wet.PERF
3rd	/de-k'e-ná-ghe-**Ø-l-**tsël/	/de-k'e-ná-he-ghe-**Ø-l-**tsël/
	0-1-1-10-**11-13-**stem	0-1-1-7-10-**11-13-**stem
	REFLO-PERAMB-CONT-ACT-**PERF-**	REFLO-PERAMB-CONT-3plS-ACT-**PERF-**
	CAUS.MID-wet.PERF	**CAUS.MID-**wet.PERF
Imprs	/de-k'e-ná-ts'e-ghe-**Ø-l-**tsël/	
	0-1-1-7-10-**11-13-**stem	
	REFLO-PERAMB-CONT-IMPRSS-ACT-**PERF-CAUS.MID-**wet.PERF	

In (9) and (10) we see that, in both *d-* and *l*-classifier verbs, the *ne* perfective marker appears nowhere, and instead the Ø-allomorph of the perfective is used throughout the paradigm. The reason for positing a Ø-allomorph in these paradigms is, briefly, that in a morpheme-based theory, it is necessary that every morphosyntactic feature be introduced by some morpheme (as in (15)). Without a Ø-allomorph of the perfective, it would be necessary to assert that the paradigms in (9) and (10) are left unspecified for

viewpoint aspect. However, there is evidence that these forms are indeed perfective, even though no overt perfective marker is present. This evidence will be explored in greater detail in §4.0.

3.2 Analysis: *ne* is constrained not to appear with middle voice.

In this section, I formalize the constraints which prohibit the *ne* perfective marker from appearing in *d-* and *l*-classifier verbs. Following Rice (2000: 126), I assume that the *ł*-classifier is a causativizer, *d*-classifier represents middle voice, and *l*-classifier is a causative-middle. The lexical entries for these prefixes are given in (11).

(11) Lexical entries for classifiers (voice/valence).

ł: V_{Prefix} – Level 1   **d:** V_{Prefix} – Level 1   **l:** V_{Prefix} – Level 1
  @CAUSATIVE   ($\uparrow$ VOICE) = MID   @CAUSATIVE
                                 ($\uparrow$ VOICE) = MID

This being the case, I claim that the lexical entry for *ne* is sensitive to the middle voice feature on *d/l*-classifiers. Specifically, it is constrained not to occur with middle voice, as shown in (12).

(12) Lexical Entry for /ne/

ne: V_{Affix} – Level 2
       ($\uparrow$ ASP VPT) = PERF
       ($\uparrow$ VOICE) $\neg=$ MID

These constraining equations then act as a filter on derivations. If *ne* occurs with the Ø- or *ł*-classifier, the output is well-formed, as in (13), whereas if *ne* occurs with the *d-* or *l*-classifier, the output is ill-formed, as in (14).

(13) Well-formed output: /ghe-ne-tságh/ → *hįtságh* 'he/she cried' (PERF).
Input to Level 2:

ghe: V_{Prefix} – Level 2   **ne:** V_{Prefix} – Level 2   **tságh:** V_{Stem} – Level 2
   ($\uparrow$ASP SIT) = ACT   ($\uparrow$ ASP VPT) = PERF   ($\uparrow$ PRED) = 'cry <SUBJ>'
                    ($\uparrow$ VOICE) $\neg=$ MID   ($\uparrow$ ASP VPT) $=_c$ PERF

Output of Level 2:

$$\textbf{hįtságh} \xrightarrow{\phi} \begin{bmatrix} \text{PRED} & \text{'cry <SUBJ>'} \\ \text{ASP} & \begin{bmatrix} \text{VPT} & \text{PERF} \\ \text{SIT} & \text{ACT} \end{bmatrix} \end{bmatrix}$$

(14) Ill-formed output: /ghe-ne-d-shën/ → *hɹ̯jën 'he/she sang' (PERF).

Input to Level 1:

d: V*Prefix* – Level 1   **shën:** V*Root* – Level 1
    ($\uparrow$ VOICE) = MID   ($\uparrow$ PRED) = 'sing <SUBJ>'

Output of Level 1:

jën $\xrightarrow{\phi}$ $\begin{bmatrix} \text{PRED} & \text{'sing <SUBJ>'} \\ \text{VOICE} & \text{MID} \end{bmatrix}$

Input to Level 2:

ghe: V*Prefix* – Level 2   **ne:** V*Prefix* – Level 2   **jën:** V*Stem* – Level 2
    ($\uparrow$ASP SIT) = ACT   ($\uparrow$ ASP VPT) = PERF   ($\uparrow$ PRED) = 'sing <SUBJ>'
                      ($\uparrow$ VOICE) $\neg=$ MID   ($\uparrow$ VOICE) = MID

Output of Level 2—***CRASH***.

hɹ̯jën $\xrightarrow{\phi}$ $\begin{bmatrix} \text{PRED} & \text{'sing <SUBJ>'} \\ \textbf{VOICE} & \textbf{MID} \\ \text{ASP} & \begin{bmatrix} \text{VPT} & \text{PERF} \\ \text{SIT} & \text{ACT} \end{bmatrix} \end{bmatrix}$

      At Level 1, the root *shën* 'sing' (which exists independently as a noun meaning 'song') combines with *d* to form the middle voice verb stem *jën*. However, if at Level 2 this stem combines with the perfective marker *ne*, the feature [VOICE MID] in the lexical entry of *jën* conflicts with the negative constraining equation in the lexical entry of *ne*, which prohibits the latter prefix from co-occuring with middle voice, and, as a result, the derivation crashes. Thus, constraining equations act as a filter on outputs. In reality, for this verb, the Ø-allomorph of the perfective is used instead: /ghe-Ø-d-shën/ → *hejën*. The lexical entry for this Ø-perfective is given in (15).

(15) Lexical Entry for /Ø/
Ø: V*Affix* – Level 2
   ($\uparrow$ ASP VPT) = PERF

      This morpheme functions as the "elsewhere" perfective allomorph. As the lexical entry in (15) does not contain any constraining equations referring to person, number, or aspect, some independent principle is necessary to ensure that Ø is not used everywhere, in place of *ne*—for example, a constraint such as REALIZEMORPHEME (Kurisu 2001—see §5.2).

4.0 Perfectivity and situation aspect ('conjugation') interactions
4.1 Data.

The Athabaskanist literature traditionally recognizes four 'conjugation markers': *the* (< **s*), *ghe, ne*, and *í* (e.g. Rice 1989). While the term 'conjugation' suggests arbitrary verb classes, more recent work has argued that these prefixes represent accomplishment, activity, achievement, and semelfactive situation aspect, respectively (Rice 2000: 251-281). Under this analysis, *the* 'accomplishment' and *ghe* 'activity' are lexical aspects selected by verbal roots. The main generalization to be described in this section is that *the* and *ghe* occur only in the perfective; in the imperfective, these same verbs are left unspecified for situation aspect.

(16) Lexical aspect distinguished only in the perfective.

   the/ghe   ne/Ø
conjugation$_{10}$ – mode$_{11}$ – subject$_{12}$ – classifier$_{13}$ – root
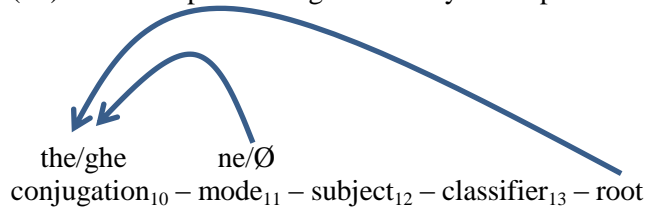
In other words, before using either *the* or *ghe*, two conditions must be met: a) the verbal root/verb theme must select the conjugation marker, and b) either *ne* or Ø must introduce the feature perfective into f-structure. This is illustrated in (17)-(18) with *nálzé*, a *the*-conjugation verb, and in (19)-(20) with *shétį* 'eat', a *ghe*-conjugation verb.

(17) The verb *nálzé* 'hunt' selects *the* conjugation in the perfective.
a. Perfective of 'hunt', surface forms.

	singular	dual/plural
1st person	ná**the**szé	ná**thí**lzé
2nd person	ná**thį**lzé	ná**thuł**zé
3rd person	ná**the**lzé	ná**hee**lzé
Impersonal	náts'**ee**lzé	

b. Perfective of *nálzé* 'hunt', underlying forms.

	singular	dual/plural
1st	/ná-**the-Ø-**s-l-zé/	/ná-**the-Ø-**íd-l-zé/
	1-**10-11-**12-13-stem	1-**10-11-**12-13-stem
	CONT-**ACC-PERF-**1sgS-	CONT-**ACC-PERF-**1plS-
	CAUS.MID-hunt	CAUS.MID-hunt
2nd	/ná-**the-Ø-**ne-l-zé/	/ná-**the-Ø-**uh-l-zé/
	1-**10-11-**12-13-stem	1-**10-11-**12-13-stem
	CONT-**ACC-PERF-**2sgS-	CONT-**ACC-PERF-**2plS-
	CAUS.MID-hunt	CAUS.MID-hunt

3rd /ná-**the-Ø-**l-zé/   /ná-he-**the-Ø-**l-zé/
        1-**10-11-**13-stem   1-7-**10-11-**13-stem
        CONT-**ACC-PERF-**   CONT-3plS-**ACC-PERF-**
        CAUS.MID-hunt   CAUS.MID-hunt

Imprs   /ná-ts'e-**the-Ø-**l-zé/
        1-7-**10-11-**13-stem
        CONT-IMPRSS-**ACC-PERF-**CAUS.MID-hunt

(18) *the*-conjugation is absent in the imperfective.
a. Imperfective of *nálzé* 'hunt', surface forms.

	singular	dual/plural
1st person	nászé	náílzé
2nd person	nánelzé	nółzé
3rd person	nálzé	náhelzé
Impersonal	náts'elzé	

b. Imperfective of *nálzé* 'hunt', underlying forms.

	singular	dual/plural
1st	/ná-s-l-zé/	/ná-híd-l-zé/
	1-12-13-stem	1-12-13-stem
	CONT-1sgS-CAUS.MID-hunt	CONT-1plS-CAUS.MID-hunt
2nd	/ná-ne-l-zé/	/ná-uh-l-zé/
	1-12-13-stem	1-12-13-stem
	CONT-2sgS-CAUS.MID-hunt	CONT-2plS-CAUS.MID-hunt
3rd	/ná-l-zé/	/ná-he-l-zé/
	1-13-stem	1-7-13-stem
	CONT-CAUS.MID-hunt	CONT-3plS-CAUS.MID-hunt

Imprs   /ná-ts'e-l-zé/
        1-7-13-stem
        CONT-IMPRSS-CAUS.MID-hunt

(19) The verb 'eat' selects *ghe* conjugation in the perfective.
a. Perfective of *shétį* 'eat', surface forms.

	singular	dual	plural
1st person	sh**ée**stį	sh**íí**tį	sh**íí**lyı
2nd person	sh**įį**tį	sh**úu**htį	sh**úu**łyı
3rd person	sh**ée**tį	shéh**ee**tį	shéh**ee**lyı
Impersonal	shéts'**ee**tį		

b. Perfective of *shétį* 'eat', underlying forms.[4]

	singular	dual	plural
1st	/shé-**ghe-Ø-**s-d-tį/	/shé-**ghe-Ø-**híd-d-tį/	/shé-**ghe-Ø-**híd-l-yı/
	4-**10-11-**12-13-stem	4-**10-11-**12-13-stem	4-**10-11-**12-13-stem
	food-**ACT-PERF-**1sgS-MID-sit.human	food-**ACT-PERF-**1plS-MID-sit.human	food-**ACT-PERF-**1plS-CAUS.MID-food
2nd	/shé-**ghe-Ø-**ne-d-tį/	/shé-**ghe-Ø-**uh-d-tį/	/shé-**ghe-Ø-**uh-l-yı/
	4-**10-11-**12-13-stem	4-**10-11-**12-13-stem	4-**10-11-**12-13-stem
	food-**ACT-PERF-**2sgS-MID-sit.human	food-**ACT-PERF-**2plS-mid-sit.human	food-**ACT-PERF-**2plS-CAUS.MID-food
3rd	/shé-**ghe-Ø-**d-tį/	/shé-he-**ghe-Ø-**d-tį/	/shé-he-**ghe-Ø-**l-yı/
	4-**10-11-**13-stem	4-7-**10-11-**13-stem	4-7-**10-11-**13-stem
	food-**ACT-PERF-**MID-sit.human	food-3plS-**ACT-PERF-**MID-sit.human	food-3plS-**ACT-PERF-**CAUS.MID-food
Imprs	/shé-ts'e-**ghe-Ø-**l-yı/		
	4-7-**10-11-**13-stem		
	food-IMPRSS-**ACT-PERF-**CAUS.MID-food		

(20) *ghe*-conjugation is absent in the imperfective.
a. Imperfective of *shétį* 'eat,' surface forms.

	singular	dual	plural
1st person	shéstį	shíítį	shíílyı
2nd person	shénetį	shúhtį	shúłyı
3rd person	shétį	shéhetį	shéhelyı
Impersonal	shéts'elyı		

b. Imperfective of *shétį* 'eat', underlying forms.

	singular	dual	plural
1st	/shé-s-d-tį/	/shé-híd-d-tį/	/shé-híd-l-yı/
	4-12-13-stem	4-12-13-stem	4-12-13-stem
	food-1sgS-MID-sit.human	food-1plS-MID-sit.human	food-1plS-CAUS.MID-food
2nd	/shé-ne-d-tį/	/shé-uh-d-tį/	/shé-uh-l-yı/
	4-12-13-stem	4-12-13-stem	4-12-13-stem
	food-2sgS-MID-sit.human	food-2plS-MID-sit.human	food-2plS-CAUS.MID-food

---

[4] In Dene languages, there are different stems to 'sit', depending on the number, position, and physical characteristics of the object: *theda* 'a human is sitting', *theʔą* 'a heavy object is sitting', *thełchúth* 'a piece of fabric is sitting', etc. The verb 'eat' uses the singular human stem for 'sit', plus the incorporated noun food, thus literally 'I food-sit (as a human)'.

3rd	/shé-d-tį/	/shé-he-d-tį/	/shé-he-l-yɪ/
	4-13-stem	4-7-13-stem	4-7-13-stem
	food-MID-sit.human	food-3plS-MID-sit.human	food-3plS-CAUS.MID-food
Imprs	/shé-ts'e-l-yɪ/		
	4-7-13-stem		
	food-impS-CAUS.MID-food		

In (17), we see that the verb *nálzé* 'hunt' selects the conjugation marker *the* (accomplishment). However, this prefix occurs only in the perfective forms in (17), not the imperfective forms in (18). Similarly, the verb *shétį* 'eat' selects the conjugation marker *ghe* (activity). However, *ghe* occurs only in the perfective forms in (19), not the imperfective forms in (20).

Assuming that *the* and *ghe* occur only in the perfective, this poses a problem given what we observed earlier, that the perfective marker *ne* does not occur in *d-* or *l-*classifier verbs. Since *shétį* is a *d-*classifier verb, and *nálzé* is an *l-*classifier verb, what introduces the feature <PERF> in these forms? Recall that, in a morpheme-based theory, every attribute-value pair in f-structure must be introduced by some morpheme. This is the reason for positing a phonologically null allomorph of the perfective prefix /Ø/, as shown in (17) and (19). The purpose of this phonologically null allomorph is to introduce the feature <PERF> and thereby license the presence of the *the* and *ghe* conjugation markers. This intuition is formalized in §4.2.

4.2 Analysis: *the* and *ghe* appear only in the perfective.

According to Rice, the prefix *ghe* represents *activity situation aspect*, or durative atelic events, while *the* (< *s) represents *accomplishment situation aspect*, or durative telic events (2000: 256). Rice argues that these prefixes are present only in the perfective, because "in imperfective and optative viewpoints…there is usually no distinction between durative verbs with natural and arbitrary endpoints: duratives are morphologically unmarked and generally undifferentiated in these viewpoints" (2000: 275). Thus, in the imperfective, *the-* and *ghe-*conjugation verbs are not only morphologically unmarked for situation aspect, but semantically unspecified for telicity as well. This intuition can be formalized in LFG through constraining equations in the lexical entries of *the* and *ghe*, as illustrated in (21).

(21) Lexical entries for *the* and *ghe*.[5]

the: V$_{Prefix}$ – Level 2   **ghe:** V$_{Prefix}$ – Level 2
($\uparrow$ ASP SIT) = ACC   ($\uparrow$ ASP SIT) = ACT
($\uparrow$ ASP VPT) =$_c$ PERF   ($\uparrow$ ASP VPT) =$_c$ PERF

These lexical entries ensure that the conjugation markers *the* and *ghe* are allowed to appear only in the perfective viewpoint. The choice of conjugation marker itself, however, is determined by the verb stem, i.e. "lexical aspect". In (22), where we see that the stem *lzé* 'hunt' is constrained to appear with accomplishment situation aspect (i.e. *the*), while the stem *tı̨* 'eat' is constrained to appear with activity situation aspect (i.e. *ghe*).

(22) Lexical entries for verb stems constrain choice of conjugation marker.

lzé: V$_{Stem}$ – Level 2   **tı̨:** VStem – Level 2
($\uparrow$ PRED) = 'hunt <SUBJ, (OBL$_\theta$)>'   ($\uparrow$ PRED) = 'eat <SUBJ, (OBL$_\theta$)>'
($\uparrow$ VOICE) = MID   ($\uparrow$ VOICE) = MID
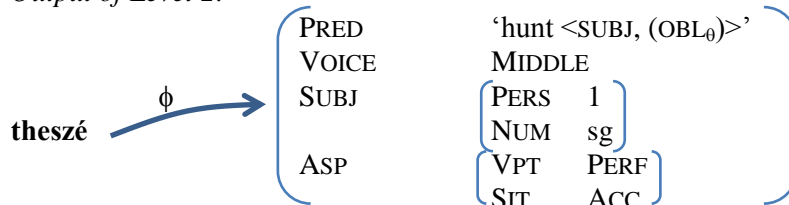($\uparrow$ ASP SIT) =$_c$ ACC   ($\uparrow$ ASP SIT) =$_c$ ACT

To summarize, the conjugation markers *the* and *ghe* require the presence of a perfective prefix Ø or *ne*, and must be compatible with the lexical aspect of the verb stem. A sample derivation of the form *nátheszé* 'I hunted' is given in (23).

(23) Sample derivation of *nátheszé* 'I hunted' (PERF).
Input to Level 2:

the: V$_{Prefix}$ – Level 2   **Ø:** V$_{Prefix}$ – Level 2
($\uparrow$ ASP SIT) = ACC   ($\uparrow$ ASP VPT) = PERF
($\uparrow$ ASP VPT) =$_c$ PERF

s: V$_{Prefix}$ – Level 2   **lzé:** V$_{Stem}$ – Level 2
($\uparrow$ SUBJ PERS) = 1   ($\uparrow$ PRED) = 'hunt <SUBJ, (OBL$_\theta$)>'
($\uparrow$ SUBJ NUM) = SG   ($\uparrow$ VOICE) = MID
                                       ($\uparrow$ ASP SIT) =$_c$ ACC

Output of Level 2:

$$
\textbf{theszé} \xrightarrow{\phi}
\begin{bmatrix}
\text{PRED} & \text{'hunt <SUBJ, (OBL}_\theta\text{)>'} \\
\text{VOICE} & \text{MIDDLE} \\
\text{SUBJ} & \begin{bmatrix} \text{PERS} & 1 \\ \text{NUM} & \text{sg} \end{bmatrix} \\
\text{ASP} & \begin{bmatrix} \text{VPT} & \text{PERF} \\ \text{SIT} & \text{ACC} \end{bmatrix}
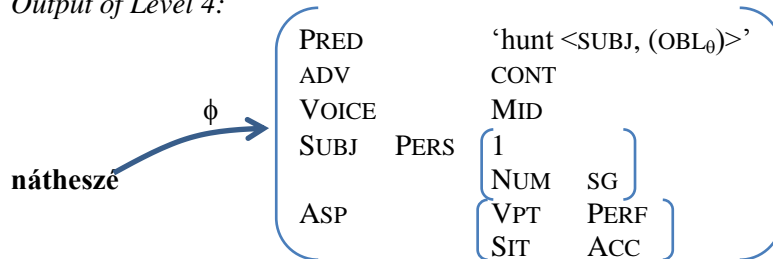\end{bmatrix}
$$

---

[5] Strictly speaking, template position numbers should be added to these and other lexical entries, to ensure that all morphemes are realized in the correct linear order.

Input to Level 4:

ná: V_{Prefix} – Level 4   **theszé:** V_{Stem} – Level 4

$(\uparrow \text{ADV}) = \text{CONT}$ $(\uparrow \text{PRED}) = \text{'hunt } \langle\text{SUBJ, (OBL}_\theta)\rangle\text{'}$

$(\uparrow \text{ASP SIT}) =_c \text{ACC}$ $(\uparrow \text{VOICE}) = \text{MID}$

$(\uparrow \text{ASP SIT}) = \text{ACC}$

$(\uparrow \text{ASP VPT}) = \text{PERF}$

$(\uparrow \text{SUBJ PERS}) = 1$

$(\uparrow \text{SUBJ NUM}) = \text{SG}$

Output of Level 4:

$$
\phi \quad
\begin{bmatrix}
\text{PRED} & \text{'hunt } \langle\text{SUBJ, (OBL}_\theta)\rangle\text{'} \\
\text{ADV} & \text{CONT} \\
\text{VOICE} & \text{MID} \\
\text{SUBJ} \quad \text{PERS} & \begin{bmatrix} 1 \\ \text{NUM} \quad \text{SG} \end{bmatrix} \\
\text{ASP} & \begin{bmatrix} \text{VPT} & \text{PERF} \\ \text{SIT} & \text{ACC} \end{bmatrix}
\end{bmatrix}
$$

náthesžé

The adverbial prefix *ná* is termed 'continuative' in the Athabaskan literature, abbreviated as CONT in the above examples. This prefix carries both a directional and aspectual meaning, and is also a "conjugation chooser," in the sense that it is required to occur with *the*-conjugation in the perfective (Ackroyd 1982, Rice 2000). The fact that a Level 4 prefix can select conjugation is problematic for a level-ordered model, as it constitutes a case of look-ahead (Rice 2000: 14, 262-268), but see Jaker (2013b) for discussion. Thus, to summarize, for the conjugation markers *the* and *ghe* to appear, they must be licensed by the verb stem, the presence of a perfective morpheme (*ne* or Ø), and, in some cases, the adverbial prefix.

5.0 A case of constraint conflict: *the*-conjugation, Ø/*ł*-classifier verbs
5.1 Data: optionality / alternate perfective paradigms

We have already seen that the *d/l*-classifiers select the Ø allomorph of the perfective, while Ø/*ł*-classifier verbs use the overt allmorph *ne*. However, there is one additional restriction: *the* cannot co-occur with *ne* (e.g. Rice & Hargus 1989). This sets up a conflict situation: in Ø/*ł*-classifier, *the*-conjugation verbs, the classifier requires *ne*, while *the* prohibits *ne*, as illustrated in (24).

(24) Classifier and conjugation marker make conflicting demands.

the   ???   Ø/ł

$\text{conjugation}_{10} - \text{mode}_{11} - \text{subject}_{12} - \text{classifier}_{13} - \text{root}$
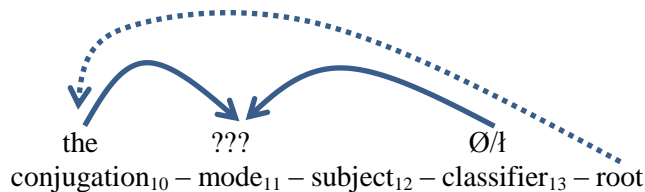
However, recall also that *the* conjugation itself is (usually) selected by the root. Thus, one way out of this problem is to switch the conjugation marker, from *the* to *ghe*. In fact this is exactly what happens: it seems that most verbs which are historically *the*-conjugation and Ø/*ł*-classifier have an alternate form which takes *ghe*-conjugation. This effect is most pronounced in Wıìlıìdeh, where it appears that some innovative speakers are switching all Ø/*ł*-classifier verbs over to *ghe*-conjugation—thus, the Weledeh Verb Dictionary includes alternate perfective paradigms for all such verbs (Jaker, Sangris & Sundberg 2012—henceforth JSS). However I have also observed this in Tetsǫ́t'ıné, and similar variation has been reported in Dëne Sųłıné (Cook 2004) and in the Behchokǫ̀ dialect of Tłı̨chǫ (Leslie Saxon, p.c.). Some examples of alternate paradigms from Wıìlıìdeh dialect are given in (25) and (26) below. Note that, in this dialect, *the* is pronounced as *whe*, and the *ł*-classifier is realized as *h*, by regular sound changes.

(25a) Perfective of *xàeht'è* 'cook', *the*-conjugation

	singular	dual	plural
1st person	xà**whı**ht'e	xà**whì**t'e	xàts'**eè**ht'e
2nd person	xà**whe**neht'e	xà**wha**ht'e	xà**wha**ht'e
3rd person	xà**whe**ht'e	xà**geè**ht'e	xà**geè**ht'e

(25b) Alternate perfective of *xàeht'è* 'cook', *ghe*-conjugation

	singular	dual	plural
1st person	xà**ı**ht'e	xà**ì**t'e	xàts'**ı̨**ht'e
2nd person	xà**nee**ht'e	xà**a**ht'e	xà**a**ht'e
3rd person	xà**ı̨**ht'e	xà**gı̨**ht'e	xà**gı̨**ht'e

(26a) Perfective of *nàehdì* 'buy, purchase', *the*-conjugation

	singular	dual	plural
1st person	nà**whı**hdì	nà**whì**dì	nàts'**eè**hdì
2nd person	nà**whe**nehdì	nà**wha**hdì	nà**wha**hdì
3rd person	nà**whe**hdì	nà**geè**hdì	nà**geè**hdì

(26b) Alternate perfective of *nàehdì* 'buy, purchase', *ghe*-conjuation

	singular	dual	plural
1st person	nà**ı**hdì	nà**ì**dì	nàts'**ı̨**hdì
2nd person	nà**nee**hdì	nà**a**hdì	nà**a**hdì
3rd person	nà**ı̨**hdì	nà**gı̨**hdì	nà**gı̨**hdì

5.2 An informal, OT-style analysis.

The variation shown in (25) and (26) could be described informally in OT using three conflicting constraints, each of which stands in for a constraining equation, or a series of equations: 1) Ø/*ł*-classifier verbs select *ne*; 2) *the* blocks *ne*; and 3) The verbal root selects *the*. This is shown in the

tableau in (27). The examples are in Wıı̀lıı̀deh; thus recall that *the* → *whe* and *ł* → *h* in this dialect.

(27) Informal, OT-style tableau.

	the blocks *ne*	Ø/*ł*-classifier selects *ne*	Verb root selects *the*
a. /xà-whe-ne-h-t'e/ → **xàwhı̨ht'e** 'he/she cooked' (PERF)	*!		
☞b. /xà-whe-Ø-h-t'e/ → **xàwheht'e** 'he/she cooked' (PERF)	✓	*	
☞c. /xà-ghe-ne-h-t'e/ → **xàı̨ht'e** 'he/she cooked' (PERF)	✓ (satisfied vacuously)		*

The highest constraint is that *the* blocks *ne*: this is never violated. In fact, this seems to be true throughout the Dene language family, as there is no evidence that these prefixes ever occurred together historically (Sharon Hargus, p.c.). The remaining two constraints are lower-ranked, and unranked relative to each-other; this is why there is variation in the language: one may either maintain *the*-conjugation and omit *ne*, as in candidate (b), or include *ne* and change the conjugation marker, as in candidate (c). The above presentation is merely informal, of course—the exact way in which LFG constraining equations may be formalized as OT constraints is a question for further research.

6.0 Conclusion.
Dene languages show widespread selection and blocking effects across different template positions. These effects are different from other types of "blocking" reported in the morphological literature, where a more specific affix blocks a more general one, i.e. the "elsewhere condition" (e.g. Anderson 1992). While such effects have often been described informally in the Athabaskan literature (e.g. Rice 1989), they have, to date, not been formalized precisely in any theoretical framework. In this paper, I have shown how the LFG device of *constraining equations* provides a convenient way to formalize selection and blocking effects in Dene languages. A direction for future empirical research is to further cases of variation, where there are conflicting selectional restrictions, or where a verb may belong to more than one verb class. To account for such cases, LFG constraining equations could be re-formulated as ranked and violable constraints in OT.

References.

Ackroyd, Linda. 1976. Proto Northeastern Athapaskan: Stem-initial consonants and vowels. Manuscript., University of Toronto.

Ackroyd, Lynda. 1982. Dogrib Grammar. Manuscript, University of Toronto.

Anderson, Stephen. 1992. A-Morphous Morphology. Cambridge University Press.

Asudeh, Ash; Mary Dalrymple, and Ida Toivonen. 2013. Constructions with Lexical Integrity. *Journal of Language Modelling* 1 (1): 1-54.

Bresnan, Joan. 2001. Lexical Functional Syntax. Blackwell.

Cook, Eung-Do. 2004. A Grammar of Dëne Sųłıné (Chipewyan). Algonquian & Iroquoian Linguistics, Memoir 17.

Dalrymple, Mary. 2001. Lexical Functional Grammar. Academic Press.

Dalrymple, Mary; Ronald M. Kaplan, and Tracy Holloway King. 2004. Linguistic generalizations over descriptions. *Proceedings of the LFG04 Conference*: 199-208. CSLI Publications.

Halpern, Aaron. 1992. Topics in the placement and morphology of clitics. Palo Alto: Stanford University dissertation.

Hargus, Sharon. 1988. The Lexical Phonology of Sekani. Los Angeles: UCLA dissertation.

Hargus, Sharon & Siri Tuttle. 2004. Explaining Variability in Affix Order: the Athabaskan areal and third person prefixes. *Working Papers in Athabaskan Languages* 4: 70-98. Alaska Native Language Center.

Hoijer, Harry. 1945. The Apachean Verb, part 1: verb structure and pronominal prefixes. *International Journal of American Linguistics* 11: 193-203.

Hopper, Paul & Sandra Thompson. 1980. Transitivity in Grammar and Discourse. *Language* 56 (2): 251-299.

Jaker, Alessandro. 2012. Prosodic Reversal in Dogrib (Weledeh Dialect). Palo Alto, CA: Stanford Dissertation.

Jaker, Alessandro. 2013a. In Defense of Tone Reversal: *the*-conjugation in NE Dene Languages. Manuscript, available at www.iceroadlinguist.com.

Jaker, Alessandro. 2013b. Selection and Blocking in the Northeast Dene Verb: Some Counterexamples to Level Ordering. Poster presented at American International Morphology Meeting 2, UCSD, November 2013, available at www.iceroadlinguist.com.

Jaker, Alessandro; Fred Sangris, and Mary Rose Sundberg (eds.). 2012. Wıılıìdeh Wet'à Edàgot'ı Yatıì Enįhtł'è / Weledeh Language Verb Dictionary. Goyatıkǫ̀ Laguage Society, Yellowknife, NWT.

Kari, James. 1989. Affix Positions and Zones in the Athapaskan Verb Complex: Ahtna and Navajo. *International Journal of American Linguistics* 55: 424-54.

Kiparsky, Paul. 1982. Lexical Phonology and Morphology. In I.S. Yang (ed.) *Linguistics in the Morning Calm*, Hanshin Publishers, Seoul.

Kiparsky, Paul. 1985. Some consequences of lexical phonology. *Phonology Yearbook* 2: 85-138.

Kurisu, Kazutaka. 2001. The Phonology of Morpheme Realization. Doctoral Dissertation, UC Santa Cruz.

Leer, Jeff. 1979. Proto-Athabaskan Verb Stem Variation Part One: Phonology. *Alaska Native Language Center Research Papers* no. 1. Fairbanks: ANLC Publications.

Li, Fang-Kuei. 1946. Chipewyan. In *Linguistic Structures of Native America*, Harry Hoijer et al. (eds.): 398-423. Viking Fund Publications in Anthropology, Number 6. New York: The Viking Fund.

Nordlinger, Rachel. 1997. Constructive Case: Evidence from Australian Languages. CSLI Publications, Stanford, California.

Nordlinger, Rachel. 2010. Verbal morphology in Murrinh-Patha: evidence for templates. *Morphology* 20: 321-341.

Pesetsky, David. 1979. Russian morphology and lexical theory. Manuscript, MIT.

Rice, Keren. 1982. On stems and Lexical Phonology: an Athapaskan example. Handout presented at the Canadian Linguistics Association.

Rice, Keren. 1989. A Grammar of Slave. Mouton de Gruyter.

Rice, Keren. 2000. Morpheme Order and Semantic Scope. Cambridge University Press.

Rice, Keren & Sharon Hargus. 1989. Conjugation and mode in Athapaskan languages: Evidence for two positions. In Cook & Rice (eds.) *Trends in Linguistics State-of-the-Art Reports 15: Athapaskan linguistics, current perspectives on a language family.* Berlin & New York: Mouton de Gruyter.

Sells, Peter. 1995. Korean and Japanese Morphology from a Lexical Perspective. *Linguistic Inquiry* 26 (2): 277-325.

Simpson, J. & Withgott, M. 1986. Pronominal clitic clusters and templates. In Hagit Borer (ed.) *The syntax of pronominal clitics. Syntax and semantics* 19: 149-174. New York: Academic Press.

Stump, Gregory. 2001. Inflectional Morphology: a theory of paradigm structure. Cambridge University Press.