Event-Semantics Packaging and the Manner/Means Constraint on Algonquian Verbal Stem Structure

Conor McDonough Quinn
ELDP/MIT*
cmquinn@mit.edu
81st Annual Meeting of the Linguistic Society of America, Hilton Anaheim Hotel, 4-7 January 2007, Anaheim, CA

1. Introduction

1.1 Overview

- Since Bloomfield (1927, 1941, 1946, 1957, 1962), Algonquian verbal stem structure has been analyzed in terms of a maximally ternary templatic structure: *Initial-(Medial)-Final* (IMF)

(1) IMF template analysis *Penobscot (Eastern Algonquian)*

Stem:	wəčkawαpekihl.α-	'(animate) swings along in this direction' (PD:1996)
Initial:	wəčkaw-	'hither'
Medial:	-αpek-	'swing; cord'
Final:	-hl.α	'NA move, change'

- Previously: degree of iterability, minimal subset of IMF for well-formed stem, how Final element determines the stem's syntactic category (Rhodes 2006, 2003, Goddard 1990, Brittain 2002)

- Here: role of IMF in event-semantics packaging (Talmy 2000a,b, 1985)

❖ General constraint on IMF:

Penobscot intransitive verbal stems of motion (and stance) consistently exclude Path (=Direction)/Result information from morphologization as Finals; this information can only be packaged as Initials

- constraint defined only for and on *Finals*: Finals restricted to packaging Manner (more precisely, *Means*) information

→ Finals exist matching English Manner/Means-incorporating verbs: *fly, run, paddle, swim, shake*
none exist matching Path- (Direction-)incorporating verbs: *come, go, arrive, return, ascend, descend*

- Pervasive:

  (1) diachronic stability: same in Penobscot, Nishnaabemwin…
  (2) productive: holds over stem-derived Finals, despite rich semantics (*pick berries*, etc.)
  (3) extensive: applies to transitive Finals…and in fact accounts for *Instrumental Finals*

- consistent and constrained semantic packaging in Algonquian verb stems supports view that polysynthetic stem structure is never a lexical-semantic combinatory free-for-all, and instead is subject to principled rules

* *This work is supported by a postdoctoral fellowship from the Hans Rausing Endangered Languages Project (www.hrelp.org), which is hosted by the MIT Department of Linguistics and Philosophy.*

2. IMF structure

2.1 The IMF structure: form and content

- IMF: maximally tripartite, each part named for its positional distribution
- excepting certain types of Initials, all are bound morphology (cf. Salishan lexical affixes)

(2) Primary stem structures (Penobscot; following Goddard 1990:451)

a. Initial

Stem:	nəpi(y)-	'water'
Initial:	nəpi-	'water'
cf. stem:	nəpi-w.i-	'NI be watery, wet (in the sense of covered or washed by water)'

b. Initial-Final

Stem:	apakəss.in-	'NA lie facedown, flat, right-side down; NA lie flat on h/her belly'
Initial:	apak-	'flat'
Final:	-hs.in	'NA lie, be laying'

c. Initial-Medial-Final

Stem:	apakihpskʷanehs.in-	'NA lie flat on h/her back'
Initial:	apak-	'flat'
Medial:	-(ə)hpəskʷan.e-	'back'
Final:	-hs.in	'NA lie, be laying'

- in principle, a language could distribute different subtypes of semantics rather freely or randomly across lexical affix categories...

→ not in *this* system!

- Algonquianists note IMF-based semantic division of labor (esp. wrt Finals, Abstract Finals: Denny 1989, 1984, 1981, 1978, Rhodes 2006, 1980)

- Valentine 2001: detailed, encyclopedic account of IMF lexemes, including overview:

(3) Properties of the IMF pattern (Valentine 2001:333)

INITIAL (ROOT)	MEDIAL	FINAL
Primary • adjectival • adverbial Secondary • nominal • verbal	Nominal • body part • classifier • goal noun	Part of Speech Category / Verb Meanings defines part of speech (abstract final) and may add additional meaning (concrete final)

- Rhodes 2006 summarizes and elaborates semantic aspects of (3):

(4) Rhodes (2006:1) on IMF semantics

> Initials generally contain modificational information, most commonly information about the resultant state of the notional absolutive. Finals are the "real" verbs, with meanings like 'walk', 'grasp', 'see', 'think' and so on.

- illustrating semantic compartmentalization: *intransitive motion-verb stems*

(5) Valentine 2001:342 on the IMF structure of intransitive motion-verb stems

> Motion verbs customarily have a final specifying the nature of the motion, or the means of conveyance. Initials consist of DIRECTIONALS and other specifications of path, RELATIVE ROOTS, and a host of Manner terms

- same in Penobscot:

(6) Semantic compartmentalization in motion-verb stems (Penobscot, cf. Valentine 2001:372, 384)

Stem:	nahihl.α-	'NA go downstream'	
Initial:	nah-	'downstream'	= **DIRECTION**
Final:	-hl.α	'NA move, change'	= **MEANS**

- schematized:

(7) Intransitive motion-verb stem schema

Initial-	-Final
|	|
DIRECTION-	**-MEANS**

- Nishnaabemwin and Penobscot animate intransitive Motion Finals match up nicely:

(8) Nishnaabemwin (Valentine 2001:374) and Penobscot AI Motion Finals compared

a. Nishnaabemwin		b. Penobscot	
-aabono	'by boat, floating'	*-akʷəho.k.e*	'float'
-aaboozo	'float'	*-akʷəho.k.e*	'float'
-aadagaa	'swim, wade'	*-akʷič.in*	'swim'
		-ɑsok.e	'wade'
-aandwe	'climb	*-ɑtaw.e*	'climb'
-aashi	'be blown, sail'	*-əlɑmso.k.e*	'be blown by wind'
-akawe	'move leaving tracks'	*-ɑpt.o*	'leave tracks'
-akozhiwe	'paddle, sail'	*-pəy.e*	'paddle'
-bagizo	'move quickly, rapidly'	*-has.i*	'rapid change of state/position'
-bahigo	'ride on horseback'	*-əwam.əkʷ.e*	'ride on horseback'
-bahiwe	'flee, running'	*-phow.e*	'flee'
-batoo	'run'	*[full stem only, no Final]*	
-daabaanigo	'by vehicle'	*-ɑčkʷiph.{IpsAgt}*	'ride in car'

-daabii	'dragging, by wagon, by sled'	*-ənahs.i*	'drag sled'
-gaa	'dance'	*-ək.ɑ*	'dance'
-gaashin	'move leaving a trail'	*-ɑpt.o*	'leave tracks'
-ise	'fly'	*-təwihl.ɑ*	'fly'
-oode	'crawl'	*-kʷ.əs.i*	'crawl'
-oomigo	'on horseback'	*-əwam.əkʷ.e*	'ride on horseback'
-ose	'walk'	*-ohs.e*	'walk'
-shimo	'dance'	*-ək.ɑ*	'dance

- some: just direct/partial cognates, but...
- many: comparable semantics, via completely distinct etymological means---but still Finals

→ such overlap is unexpected if each language is free to distribute semantic components arbitrarily across the set of IMF elements, or to develop own distinct constraints thereon

2.2 Talmyian analysis: lexicalization patterns

- compartmentalization of semantic labor = Talmyian *lexicalization patterns* (Talmy 2000a, b)

= separate out key semantic components of verbal event structure (Motion, Path, Goal, Manner...)
- see how they "characteristically" manifest as surface lexical elements:
- which semantic components "characteristically" appear as as *independent* morphemes
- which semantic components "characteristically" appear as as *conflated* morphemes

- "characteristic" = frequent, colloquial, pervasive lexicalization pattern (Talmy 2000b:27)

- EXAMPLE: boat moves, by floating, ends up inside something

- English: conflate *Manner* (floating) w/ *Motion* (moving) into a single element (the verb *float*), then farm out *Path* traveled as a separate element (*into*):

(9) The boat floated into the cave. (adapted from Talmy 2000b:49:(29a))

float in

MOTION+MANNER **PATH**

- other languages (Spanish, etc.): conflate *Motion* with Path into single element (≈ verb like *enter*), then farm out *Manner* of that motion separately:

(10) The boat entered the cave floating. (cf. Talmy 2000b:49:(29a))

enter floating

MOTION+PATH **MANNER**

→ clunkiness of this sentence illustrates its non-"characteristic" nature in English

- Penobscot (and Nishnaabemwin) evidently more of the first type (9)
→ Motion + *Manner* (more precisely, *Means* = "instrument"of motion or stance) *conflated*
= **FINALS**:

(11) Motion and Manner (*Means!*) conflation: Penobscot Means of Motion Finals

-ohs.e	'NA walk'
-pəy.e	'NA paddle (watercraft)'
-akʷič.in	'NA swim'
-kətah.i	'NA jump'
-ək.α	'NA dance'
-hl.α	'NA move, change'

• correspondingly, Path (Directional) semantics---lexicalized *separately*
= **INITIALS**:

(12) Separate lexicalization: Directional Initials

wəčkaw-	'to here'
ələm-	'away'
awep-	'up'
pənekʷ-	'down'
note-	'out(side)'
pitike-	'inside (a house, building)'
naləm-	'upstream'
nah-	'downstream'

→ earlier schema (7) for Penobscot and Nishnaabemwin is a Talmyian lexicalization pattern (13):

(13) Intransitive motion-verb stem schema

Initial-	-Final
|	|
DIRECTION-	**-MEANS**

• can (oversimplifying) loosely say that Penobscot (and Nishnaabemwin) share same lexicalization pattern as English...simply differ in the order in which the separate components appear:

(14) Ordering of separate and conflated components

a.	note-	-ohs.e	(Penobscot:	*notesse-* 'walk out')
	OUT	**WALK**		
b.	walk	out	(English:	*walk out* 'walk out')
	WALK	**OUT**		

• potent(ial) pedagogical value: brings order, familiarity to what English-based learners generally see as giant polysynthetic monster words

❖ Penobscot (also Nishnaabemwin?) lexicalization pattern not just characteristic: *exceptionless*

• not only just rich set of attested motion-verb stems, but also *principled lexical gaps*

• all Directional semantics rigidly excluded from manifestation via Finals

→ there are *no* Finals with any Directional semantics at all

- i.e. nothing corresponding to monomorphemic (?) English Direction-incorporating verb stems:

(15) English Direction-incorporating verb stems

come
go (in the sense of *go away*)
arrive
return
ascend
descend

- semantically comparable Penobscot stems require appeal to Initials to express Direction component; end up as bipartite Initial-Final structures (X, X):

(16) Directional Motion verb stems in Penobscot (I): ≈ English *go*

a.	Stem:	əlәmihl.α-	'NA go away'	
	Initial:	əlәm-	'away'	= **DIRECTION**
	Final:	-hl.α	'NA move, change'	= **MEANS**
b.	Stem:	əlәmohs.e-	'NA walk away, onward'	
	Initial:	əlәm-	'away'	= **DIRECTION**
	Final:	-ohs.e	'NA walk'	= **MEANS**
c.	Stem:	əlәmakʷim.i-	'NA glide off, away into the water'	
	Initial:	əlәm-	'away'	= **DIRECTION**
	Final:	-akʷim.i	'NA swim (gliding)'	= **MEANS**

(17) Directional Motion verb stems in Penobscot (II) ≈ English *come*

a.	Stem:	pečihl.α-	'NA come'	
	Initial:	pet-	'arrive (here)'	= **DIRECTION**
	Final:	-hl.α	'NA move, change'	= **MEANS**
b.	Stem:	pečohs.e-	'NA arrive, walk hither'	
	Initial:	pet-	'arrive (here)'	= **DIRECTION**
	Final:	-ohs.e	'NA walk'	= **MEANS**
c.	Stem:	petakʷim.i-	'NA glide off, away into the water'	
	Initial:	pet-	'arrive (here)'	= **DIRECTION**
	Final:	-akʷim.i	'NA swim (gliding)'	= **MEANS**

- such a consistent pattern is unlikely to be coincidental
- constraint looks to be acting as/from a deeply-entrenched principle of the lexicon system

- **NEXT UP**: 3 lines of evidence for a "deep principle"

3. Evidence for a "deep principle"

3.1 Diachronic stability

- constraint is evidently shared between Nishnaabemwin and Penobscot (8)
  - present field work (+ antecedents' fine lexicography!): Passamaquoddy-Maliseet, too
  - also W. Abenaki, other E. Abenaki dialects; and, tentatively, Munsee (O'Meara 1990)
  - still brewing: rest of the Algonquian family? Plains languages and Blackfoot?

→ Penobscot + Nishnaabemwin just by themselves show a substantial degree of diachronic stability
→ argues against constraint being accidental/lang-specific pattern, and for being principled rule

3.2 Language-internal stability/productivity

- language-internal stability: to the extent that derivation of Penobscot Finals is productive, the very same constraint applies

- Finals typically characterized as a closed class (Rhodes 2006:1, Valentine 2001:33, inter alia)

→ but at the same time Algonquianists also note a process deriving Finals from full stems:

- *stem-derived Finals (SDFs)*: take source stem and create an onsetless string from it
  - vacuous for vowel-initial stems:

(18) Stem-derived Finals: vowel-initial stems

a.	Free stem:	ap.i-	'NA sit'
	Final:	-ap.i	'[same]'
b.	Free stem:	akʷič.in-	'NA swim, NA be in the water'
	Final:	-akʷič.in	'[same]'
c.	Free stem:	alohk.e-	'NA work'
	Final:	-alohk.e	'[same]'

  - delete any stem-initial sonorant onset consonant:

(19) Stem-derived Finals: sonorant-onset-initial stems (cf. Rhodes 2006, Wolfart 1996)

Free stem:	mawis.i-	'NA gather, pick berries, nuts, or fruit'
Final:	-awis.i	'[same]'

  - initial obstruent onset (?): Valentine 2001:399: Final *-aapi*, stem *baapi-* 'laugh'

- SDF process evidently rather limited: unknown if it is purely historical, or simply quite limited in synchronic productivity

❖ all evident examples of SDFs in Penobscot obey the constraint on simplex Finals

→ this even though Final-deriving stems have Initials!
→ which, in principle, should mean that at least some SDFs could contain Directional, Result-state, or other like semantics strictly found in Initials

❖ Yet none do.

→ SDFs remain within the same semantic ranges already established for simplex Finals (X, X):

(20) Stem-derived Finals: Means of Motion

a.	Free stem:	ap.i-	'NA sit'
	Final:	-ap.i	'[same]'
	cf. stem:	sɑnkewap.i-	'NA sit peacefully, still'
b.	Free stem:	akʷič.in-	'NA swim, NA be in the water'
	Final:	-akʷič.in	'[same]'
	cf. stem:	kʷ(əh)sakɑkʷič.in-	'NA swim across a body of water'

(21) Stem-derived Finals: Means of Activity

a.	Free stem:	məkənəss.e-	'NA gather firewood/driftwood [...]'
	Final:	-əkən(əh)s.e	'[same]'
	cf. stem:	nɑtəkəns.e-	'NA go to get firewood [...]'
b.	Free stem:	natəyel.i-	'NA hunt (for various kinds of game)'
	Final:	-atəyeli	'[same]'
	cf. stem:	nɑtatəyel.i-	'NA go to hunt'
c.	Free stem:	wɑlk.e-	'NA dig, hollow out, excavate'
	Final:	-ɑlk.e	'[same]'
	cf. stem:	kisɑlk.e-	'NA have made a cache, have finished burying something'

• full-stem-derivation brings extra level of semantic richness: 'gather firewood', etc.
→ but only within the confines of what is (semantic-categorically) a permissible Final
→ even see cases where contribution of Initial is altered away from typical non-Final semantics:

• first: Initial *akʷit-* 'immersed or soaked in water' can also function as a Result-state Initial:

(22) *akʷit-* 'immersed or soaked in water' as a Result-state Initial

Stem:	akʷitən.ɑ-	'place NA in water, soak NA in water'	
Initial:	akʷit-	'immersed'	= Result
Final:	-ən.ɑ	'handle.NA'	= Causal Means

• second: Initial *akʷit-* also an element in a stem-derived Final...
• ...cf. full-stem *akʷič.in-* 'NA swim, NA be in the water':

(23) Full stem *akʷič.in-* 'NA swim, NA be in the water'

Initial:	akʷit-	'immersed'
Final	-.in	'[abstract Final]'

- Initial *ak^{w}it-* in full stem is a bit ambiguous as to whether it indicates a Result state or not, but...
- in corresponding Final (24), contribution is definitely not of a resultant immersed state---at best, only an implicit *intermediate* state---but simply to name the particular Means of Motion involved

(24) Final *-ak^{w}ič.in* 'NA swim [NA be in the water (?)]'

Stem:	pətəkak^{w}ič.in-	'NA swim back'
Initial:	pətək-	'back, returning'
Final	-ak^{w}ič.in	'NA swim'

→ here too constraint has an active effect, limiting possible SDFs

❖ the existence of this constraint may be a significant cause of the relative rarity of stem-derived Finals, as it puts rather severe limits on possible candidate stems

- insofar as derivation of Finals is productive, semantic content of output identically constrained

3.3 Transitive Finals

- constraint extends to transitive stems: transitive Motion stems have the same [*Direction-Means_of_Motion*] pattern as intransitive ones
- Final is rather explicitly the Means by which the Directional motion is carried out:

(25) [*Direction-Means_of_Motion*]: transitive stems

Stem:	awepiph^{o}.α-	'pull NA up, pull NA up above'	
Initial:	awep-	'up(wards)'	= **DIRECTION**
Final:	-ph^{o}.α	'grab NA'	= **MEANS**

- pattern esp. clear if we alternate other transitive Finals against the same Directional Initial:

(26) [*Direction-Means_of_Motion*]: transitive Finals

a.

Stem:	awepən.α-	'hold NA up by hand (with arms extended)'	
Initial:	awep-	'up(wards)'	= **DIRECTION**
Final:	-ən.α	'handle NA'	= **MEANS**

b.

Stem:	awepapil.α-	'string NA up, hang NA up with a rope'	
Initial:	awep-	'up(wards)'	= **DIRECTION**
Final:	-apil.α	'act on NA with cord'	= **MEANS**

c.

Stem:	awepkaw.α-	'push NA up with any body part (except hand)'	
Initial:	awep-	'up(wards)'	= **DIRECTION**
Final:	-əhkaw.α	'apply "other" body part to NA'	= **MEANS**

- transitive Final consistently specifies the Means of Motion, and nothing of the Direction
- same constraint appears to hold generally over transitive Finals as well

= transitive *Instrumental Finals* (Bloomfield 1962, 1946, Goddard 1990, Wolfart 1996, Rhodes 1980)

= *Instrumental Causative Finals* (Valentine 2001:438)

❖ the existence of transitive Instrumental Finals is nothing more than the logical outcome of the very same constraint seen limiting the semantic range of intransitive Finals

4. Conclusion

- fairly modest claim(s):

  • the observation that Finals in intransitive motion-verb stems typically carry Means semantics (as against Initials, which carry Direction, etc.) reflects an *active* constraint:

  (1) diachronically stable
  (2) synchronically productive (assuming stem-derived Finals are not just fossils)
  (3) pervasive: cross-cuts transitivity, creates morphosemantic classes like Instrumental Finals

❖ this constraint is almost certainly not the fundamental one!

→ Valentine 2001:438: *Instrumental Causative Finals*
→ i.e. same elements in Cause-Result stems, indicating causal Means:

(27) Instrumental Finals as Causative Means Finals

a.	Stem:	səkʷəskən.α-	'crack, fracture, break NA into pieces'	
	Initial:	səkʷəsk-	'into pieces'	= **RESULT**
	Final:	-ən.α	'handle NA'	= **CAUSAL MEANS**

- short jump to link the two (from *Means of Motion* to *Means of Causation*):

(28) Collapsing construction types: *Means*

[*(Instrumental) Means of Causation*] + [*Means of Motion*]

→ [*Means*]

- promising, but difficult to accomplish with precision...
- can intuit links btw [*Direction-Means_of_Motion*] and [*Result-Means_of_Causation*] constructions
- but can we form a unified account with other stem constructions, e.g. *intransitive* Cause-Result?
- e.g. can we plausibly collapse transitive Cause-Result structures with intransitive ones? (cf. collapsing transitive and intransitive [*Direction-Means_of_Motion*]):

(29) Collapsing construction types: *transitivity*

a. transitive[*Result-Cause*] + intransitive[*Result-Cause*]
→ {transitive + intransitive}[*Result-Cause*]

b. transitive[*Direction-Means_of_Motion*] + intransitive[*Direction-Means_of_Motion*]
→ {transitive + intransitive}[*Direction-Means of Motion*]

- having earlier collapsed different roles of Finals as *Means*, now collapse Result (-State) and Direction?

→ could set up Direction as a sort of "intended" Result (-State)

→ but we clearly need a more precisely constrained approach to this kind of reductive analysis

☺ for now, don't need to go this far: nature of Initial semantic components left as open, elsewhere class

→ reflects semantic (and possibly syntactic) diversity of verb-stem's "Left Edge" (Brittain 2002)

→ keeps focus on the evidently specifically constrained set, i.e. the Finals

→ also predicts: Means semantics not in principle blocked from manifesting as Initials (else no SDF)

- off the hook for now, but still no unified account for all semantically compartmentalizing IMF constructions---including those not even discussed here (plain stative stems, etc.)

- appeal to event-structural macro-roles?

= Ramchand 2006:18: "three sub-event projections are necessary to represent all the possible components of the event structure building processes of natural languages"

= **{cause, process, result}**

- simple: Finals = {cause, process} Initials = {result}

- nice: Finals could denote events or processes (+ causes) simply by inheritance from abstract Finals (cf. Rhodes 2006:6)

- but: problems galore...

So: present results still early approximation, far from ideal in terms of a theoretical understanding

❖ ...but have much promise for pedagogical purposes:

→ this rigid structure-to-semantics compartmentalization might help acquisition of polysynthetic bound-morphology lexicon...

→ i.e. radically narrows the search space for a child seeking to map a meaning to an element that they never even hear in isolation

- this "shortcut" reapplied to second-language learning: knowing the semantic domain that each IMF component is limited to makes learning them easier, and facilitates guessing from context the meanings of new ones, and recalling those of half-remembered ones

- accessibly presented, attention to IMF semantic compartmentalization can disentangle and de-exoticize Algonquian lexicons for second-language learners

5. References

Bloomfield, Leonard.
1962. *The Menomini language.* Charles F. Hockett, ed. New Haven, CT: Yale University Press.
1946. Algonquian. In *Linguistic structures of native America.* Harry Hoijer et al., eds. Viking Fund Publications in Anthropology 6. New York: Wenner-Gren Foundation for Anthropological Research. 85-129.

Brittain, Julie.
2002. A verb stem template for Algonquian. Paper presented at the 34th Algonquian Conference, Queen's University, Kingston, Ontario, 27 Oct. 2002.

Denny, J. Peter.
1989. The nature of polysynthesis in Algonquian and Eskimo. In *Theoretical perspectives on Native American languages.* Donna B. Gerdts and Karin Michelson, eds. Albany: State University of New York Press. 203-258.
1984. Semantic classes and abstract finals. In *Papers of the 15th Algonquian Conference.* William Cowan, ed. Ottawa: Carleton Unversity. 241-71.
1983. Semantics of abstract finals in Algonquian transitive inanimate verbs. *Canadian Journal of Linguistics* 28: 133-48.
1981. Algonquian word structure from the viewpoint of logical semantics. *Montréal Working Papers in Linguistic*s 16: 21-29.
1978. Verb class meanings of the abstract finals in Ojibway inanimate intransitive verbs. *International Journal of American Linguistics* 44: 294-322.

Goddard, Ives.
1990. Primary and secondary stem-derivation in Algonquian. *International Journal of Linguistics* 56:4: 449-483.

Hirose, Tomio.
2003. *Origins of predicates: evidence from Plains Cree.* New York: Routledge.

O'Meara, John.
1990. *Delaware stem morphology.* Ph.D. dissertation, McGill University.

Rhodes, Richard.
2006. Ojibwe abstract finals revisited. Ms., UC-Berkeley, Berkeley, CA.
2003. Non-medial incorporation in Ojibwe. Paper presented at 41st CAIL-2, LSA, Atlanta, GA, 2 Jan. 1980.
1980. On the semantics of the instrumental finals in Ojibwa. In *Papers of the 11th Algonquian Conference*. William Cowan, ed. Ottawa: Carleton University. 183-197.

Siebert, Frank T. Jr.
1996. *Penobscot dictionary*. Ms, Old Town, Maine.

Snow, Dean.
1968. Recording of Dean Snow, Theodore Mitchell, Arthur Neptune, and Andrew Dana. Indian Island, Maine.

Talmy, Leonard.
2000a. *Toward a cognitive semantics, volume I: concept structuring systems.* Cambridge, MA: MIT Press.
2000b. *Toward a cognitive semantics, volume II: typology and proces in concept structuring systems.* Cambridge, MA: MIT Press.
1985. Lexicalization patterns: semantic structure in lexical forms. In *Language typology and syntactic description* (vol. 3): *grammatical categories and the lexicon*. Shopen, Timothy, ed. Cambridge, England: Cambridge University Press.

Valentine, J. Randolph.
2001. *Nishnaabemwin reference grammar.* Toronto: University of Toronto Press.

Wolfart, H. Christoph.
1996. Sketch of Cree, an Algonquian language. In *Handbook of North American Indians, vol. 17.* Ives Goddard, ed. 390-439.
1973. *Plains Cree: a grammatical study.* American Philosophical Society Transactions 63:5. Philadelphia: American Philosophical Society.

6. Appendix: data sources for stems and Finals cited without full reference

• Siebert 1996 (= PD:*page number*) gives 3sNA inflected forms as his basic entry; 1s forms, which unambiguously identify the stem-final vowel, were given only secondarily. To save space, we give only his original 3sNA forms, and provide the stem vowel from the 1s form without direct citation.

• The only modifications from the original Siebert 1996 ms. are replacing 'he' and 'it' (and related pronouns) with 'NA' (animate) and 'NI' (inanimate), and separating distinct senses with semicolons rather than numbered subentries.

nə̀pi	'water'			(PD:319)
nə̀pəyo	'NI is watery, wet (in the sense of covered or washed by water)'			(PD:318)
apákəssin	'NA lies facedown, flat, right-side down; NA lies flat on h/her belly'			(PD:66)
apakihpskʷánehsin	'NA lies flat on h/her back'			(PD:66)
náhihle	'NA goes, travels downstream'; nənáhihla 'I...'			(PD:293)
-akʷəho.k.e	pəmákʷəhoke 'NA floats along'			(PD:373)
-akʷič.in	pəmákʷičin 'NA swims along, by'			(PD:373)
-ɑsok.e	ásəwɑsoke 'NA wades diagonally'	[N.B. accent questionable]		(PD:119)
-ɑtaw.e	pámɑtawe 'NA climbs'	[N.B. accent questionable]		(PD:374)
-əlɑmso.k.e	pəmələ́msoke 'NA/NI is blown along by the wind'			(PD:375)
-ɑpt.o	pə̀mɑpto 'NA leaves footprints'			(PD:374)
-pəy.e	pə̀mipəye 'NA paddles along'			(PD:376)
-has.i	čánihaso 'NA is stopped, obstructed; NA stays, tarries'			(PD:128)
-əwam.əkʷ.e	nəpəməwámək^wehkhɑ 'I use NA to ride on, I ride NA'	[= 2ndry deriv.]		(PD:371)
-phow.e 'flee'	pəmíphowe 'NA flees'			(PD:376)
-ɑčkʷiph.{*IpsAgt*}	[nə]nɑtɑčkʷíphoke=ka 'I went for a ride'	[reqs. *Impers Agt* theme sign]		(Snow 1968)
-ənahs.i	pámənahso 'NA pulls, hauls a sled, draws a sled'	[N.B. accent questionable]		(PD:375)
-ək.ɑ	tàləke 'NA is dancing there, NA is in the act of dancing'			(PD:451)
-ɑpt.o	áləmɑpto 'NA makes tracks leading away, NA leaves a trail			(PD:44)
-təwihl.ɑ	aləmítəwihle 'NA flies away'			(PD:46)
-kʷ.əs.i	pə̀mikʷəso 'NA creeps, crawls along'			(PD:376)
-ohs.e	kɑkáwohse 'NA walks fast (at the top of usual capacity'			(PD:175)
áləmihle	'NA goes away'			(PD:46)
áləmohse	'NA walks away, onward'			(PD:46)
aləmákʷimo	'NA glides off, away into the water'			(PD:44)
péčihle	'NA comes'			(PD:361)
petákʷimo	'NA swims here; NA comes gliding through the water'			(PD:366)
péčohse	'NA arrives, walks hither'			(PD:361)
àpo	'NA sits'			(PD:73)
ákʷičin	'NA swims, NA is in the water'			(PD:30)
álohke	'NA works'			(PD:56)
máwiso	'NA gathers, picks berries, nuts, or fruit'			(PD:256)
mánesse	'NA gathers clams/shellfish'			(PD:251)
sɑnkéwapo	'NA sits peacefully, still'			(PD:419)
kʷsakákʷičin	'NA swims across a body of water'	[N.B. /ɑ/ vs. /a/ somewhat uncertain]		(PD:241)
mə̀kənəsse	'NA gathers firewood, driftwood (not requiring cutting or chopping)'			(PD:273)
nátəkənse	'NA goes to get firewood (that doesn't require cutting)'			(PD:304)
nátəyelo	'NA hunts (for various kinds of game)'			(PD:297)
nɑtátəyelo	'NA goes to hunt'			(PD:304)
wə̀lke	'NA digs, hollow outs, excavates'			(PD:451)
kísɑlke	'NA has made a cache, has finished burying something'			(PD:214)
nətákʷitənɑ	'I place NA in water, soak NA in water'			(PD:31)
pətəkákʷičin	'NA swims back'			(PD:387)
nətawépiphɑ	'I pull NA up, pull NA up above'			(PD:93)
nətáwepənɑ	'I hold NA up by hand (with arms extended)'			(PD:93)
nətawepápilɑ	'I string NA up, hang NA up with a rope'			(PD:93)
nətawépkawɑ	'I push NA up with any body part (except hand)'			(PD:93)
nəsəkʷəskənɑ	'I crack, fracture, break NA into pieces'			(PD:427)