

# A FEATURE GEOMETRIC APPROACH TO VERBAL INFLECTION IN ONONDAGA<sup>1</sup>

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**Abstract.** Iroquoian inflectional verbal morphology is well-documented in the descriptive literature (Chafe 1961, Lounsbury 1949, 1953, Michelson and Doxtator 2002), but has received less attention from a generative perspective. Most generative analyses of verbal inflection rely on the notion of tense as a central category and the universal projection of a T(ense) Phrase. Onondaga (Northern Iroquoian), however, often makes very little use of tense as a grammatical concept, capitalizing instead on the notions of aspect and mood, thereby rendering the standard generative approach inappropriate. Instead, we propose that a feature geometric analysis (Cowper 2005), which does not rely on tense as a central concept, is better suited for analysing the Onondaga verbal inflectional domain.

**Keywords:** Onondaga, tense, aspect, mood

## X.1 Introduction

Onondaga is a Northern Iroquoian language spoken in southern Ontario, Canada, and in New York State in the US. The Onondagas make up part of the Iroquois Confederacy, or Haudenosaunee, which also includes the Senecas, Mohawks, Cayugas, Oneidas and the Tuscaroras (who joined after the original formation of the Confederacy). The origins of Onondaga society can be traced back to at least the eleventh century in northern New York (Bradley, 1987). The Onondagas, along with the other members of the Confederacy, continue to live in the same areas they have occupied for about a millennium.

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Iroquoian inflectional verbal morphology is well-documented in the descriptive literature (Chafe 1961, Lounsbury 1949, 1953, Michelson and Doxtator 2002), but has received less attention from a generative perspective (Baker & Travis 1997, 1998). The goal of this paper is to provide a formal account of the Onondaga verbal inflectional system, a language where tense is not the crucial ingredient of INFL, but rather where the realis versus irrealis distinction, alongside aspectual distinctions seem paramount. In order to do so, we employ a feature geometric account following work by Cowper (2005), Cowper and Hall (1999), Kyriakaki (2006), and Slavin (2008). However, prior to proposing the theoretical account, we first discuss the empirical properties of the T(ense), A(spect), M(ood) system in Onondaga and show that this language appears to be, at least in some cases, tenseless. The analysis has interesting consequences for syntactic theory more generally, especially under views which take finiteness to be equivalent to tense (e.g. Carnie 2013, *inter alia*).

## **X.2 Mood, tense, and aspect in Onondaga**

The template in example (1) (based on Lounsbury 1949, 1953) lists the order of morphemes on the verbal complex for all Northern Iroquoian languages, starting at the left edge. The boldfaced elements are required in all verbal constructions. Crucially, the one constant of the Northern Iroquoian, and implicitly, Onondaga, Infl domain is the presence of aspect and not of tense.

- (1) pre-pronominal prefixes (mood, location, other semantic properties.)

**pronominal prefixes (subject and object agreement)**

reflexive or semi-reflexive

incorporated noun

**verbal root**

derivational suffixes (benefactive, causative, inchoative, etc.)

**aspect suffixes**

expanded aspect suffixes

There are four aspects in Onondaga. The first is the “habitual” aspect (HAB). This aspect is used to refer to an event that takes place repeatedly or on an on-going basis. The second is the “punctual” aspect (PUNC). This aspect refers to an entire event in its completeness. When used on a verb with a past tense reading, the event is described as “over and done-with.” The PUNC cannot describe an event that is interrupted or incomplete. The third aspect is the “stative” (STAT) aspect and it refers to an event that is ongoing or incomplete or, if it occurs in the past tense, an event that has some bearing on the present (i.e. like the English present perfect). Finally, there is the “purposive” aspect (PURP), which refers to imminent action, and usually implies intent or volition on the part of the subject. Active verbs can appear with any of the first three aspects. Motion verbs can appear with any of all four aspects. Lexically specified stative verbs can only appear with the stative aspect (Woodbury 2003: 38). Since of the four aspect types, only the HAB, PUNC, and STAT aspects are used productively, we focus our discussion on them<sup>2</sup>.

### X.2.1 Simplex aspect constructions

Simplex aspect constructions refer to verb forms that contain one of three aspect markers introduced above: habitual (HAB), stative (STAT), and punctual (PUNC), standard terms from the Iroquoianist literature. Complex aspect constructions, discussed below, contain one of these three aspect markers plus an *expanded aspect marker*. In this section, we discuss each type of aspect in turn.

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<sup>2</sup> In addition, it is unclear whether ‘purposive aspect’ is indeed aspectual in the same way as the HAB, PUNC, and STAT aspects are. Not only is intent/volition implied, but the PURP can be used together with the STAT, see (i), where it denotes a higher head in the Infl domain.

(i) sahoḥḍedyqha:dye<sup>2</sup>  
s- wa<sup>2</sup>- ho- ahtetyq -h -atye -<sup>2</sup>  
REP- FACT- 3SG.M.PAT- travel -STAT -CONT -PURP  
‘He is going home.’ / ‘He is on his way home.’

Iroquoian descriptive literature gives the following descriptions for the HAB.

Lounsbury (1953: 85) states that, “Forms in the serial [HAB] aspect represent actions which take place at repeated points in time; for the most part these correspond to the simple ‘present tense’ form in English,” and Woodbury (2003:30) mentions that, “[The HAB forms] are usually glossed in the simple present, e.g. *I sew*, or in the progressive, *I am sewing*, or both.”

Our data concur with standard description that the habitual is used to indicate an ongoing activity or state of affairs, see (2a-d). As in (2d), it often appears in nominalized forms and in professions:

(2) a. hayəthwas<sup>3</sup>

ha-                    yəthw -as  
3SG.M.AG-        plant -HAB  
‘He plants / He is planting.’

b. khenowəkhwa<sup>?</sup> ne<sup>?</sup> Meri

khe-                    nowəkw        -ha<sup>?</sup>    ne Meri.<sup>4</sup>  
1SG.AG:3SG.F.PAT-    love            -HAB    NE Mary  
‘I love Mary.’

c. henəhshənyənik

he-                    nəhsh -əny    -əni    -k  
1.SG.AG:3.SG.M.PAT-    house -make -BEN    -HAB

<sup>3</sup> The following abbreviations and notations are used: AG = agent, BEN = benefactive, CIS = cislocative, CONT = continuative, CONTR = contrastive, DIS = dislocative, DU= dual, DUC = dualic, EPEN = epenthetic vowel, F = feminine, FACT = factual, HAB = habitual, HAB.PST = habitual past, JOIN = joiner vowel, epenthetic vowel that occurs between incorporated noun and verb stem, M = masculine, MOD = modalizer, NE = functional element of unclear role found in nominal expressions, NT = neuter, OPT = optative, PAT = patient, PRES = present tense, PUNC = punctual, PURP = purposive, REFL= reflexive, REP = repetitive, SG = singular, SRFL = semi-reflexive, STAT = stative, STAT.PST = stative past, TLOC = translocative, √ = root, R = ancient ‘r’, ? = glottal stop.

<sup>4</sup> In the habitual and expanded habitual aspects, the sequence *hgw-ha* is replaced by *khwa* (cf. Zeisberger 1887: 117 in Woodbury 2003: 717).

‘I’m making a house for him.’

d. qđeıhɔ:nyɛnik

q-                    atɛ-    Rih-                    ɔny    -ɛni    -k

3.SG.F.PAT-    SRFL-    matter-                    make    -BEN    -HAB

‘She’s a teacher.’ / ‘She is teaching.’

In sum, the habitual covers both states and imperfective events, so is durative and unbounded, hence an instance of imperfective viewpoint (in the sense of Comrie 1976, etc).

With respect to the stative aspect, there are different descriptions in the Iroquoianist literature. Lounsbury (1953: 85) claims that, “Forms in the perfective [stative] aspect represent states; some of these are the results of actions,” while Woodbury (2003: 30) mentions that, “In English they [statives] are usually glossed with the perfect, e.g., *I have sewn it*, or, depending on the meaning of the base, with the progressive, *I am sewing*, Chafe (1980)”.<sup>5</sup> Our findings align with these observations (see also Abbott 2000, for Oneida).

For lexically stative roots, typically translated as adjectival non-verbal predication in English, statives are semantically a state, as in (3):

(3)                    hodaʔgaideʔ

ho-                    ataʔkait                    -eʔ

3SG.M.PAT-    be.healthy                    -STAT

‘He is healthy/feels good.’

Otherwise, use of STAT signals a state that is the result of some previous action and, in this case, it is translated with the present perfect in English, as shown in (4):

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<sup>5</sup> STAT aspect forces patient marking on subjects of intransitives of active verbs; we do not focus on this issue here.

- (4) a. (onihsih) dyagonəhayəthwih  
 (onihsih)            tya- ko-            nəh- a-            yəthw -ih  
 (long.time.ago)      CLOC- 3SG.F.PAT-      corn- JOIN- plant -STAT  
 ‘She has planted corn (a long time ago).’
- b. hohdɔh  
 ho-            ahtɔ            -h  
 3.SG.M.PAT- disappear      -STAT  
 ‘He has disappeared.’

The data in (5)-(6) suggest that the progressive reading of STAT is available only when HAB cannot have a progressive reading; compare (5a) with (5b) and (6a) with (6b):

- (5) a. hodaʔks  
 ho-            itaʔk -s  
 3SG.M.PAT- sleep -HAB  
 ‘He is sleepy.’ (Not, \*‘He is sleeping.’)
- b. hodaʔwih  
 ho-            itaʔw -ih  
 3SG.M.PAT- sleep -STAT  
 ‘He is asleep/sleeping.’
- (6) a. ekhɔnyahaʔ  
 e-            khw- ɔny -ahaʔ  
 3SG.F.AG- food- make -HAB  
 ‘She is a cook.’/‘She cooks (habitually).’

- b. hokhɔnih  
 ho-                    khw-    ɔny    -ih  
 3SG.M.PAT-    food-    make    -STAT  
 ‘He is cooking.’

In sum, use of the stative aspect: (i) either is resultative – in this case it also contains perfectivity (hence its alternate name) in that there is some previous finished event which results in some state, or (ii) indicates a lexically “stative” root, or (iii) replaces the habitual idiosyncratically. Crucially, in all its meanings, the stative instantiates imperfective aspect and its prototypical use is to encode result state since the last two uses are lexically determined, so not part of the core syntactic derivation.

Following Lounsbury (1953: 85), “Forms in the punctual aspect represent actions which take place at some particular point in time; this point in time may be past, future, or indefinite, depending on the pre-pronominal...prefix.” For Woodbury (2003: 30), on the other hand, “The punctual aspect requires one of three modal prefixes, the factual, the future, or the optative. The factual is often glossed with the simple English past, e.g. *She sewed it*; the future is glossed with the English future, e.g. *I will sew it*, and the optative is glossed variously in English as *I may sew*, *I should sew*, *I would sew*, etc.” (7) illustrates the punctual with some of our own elicited data.

- (7) a. waʔhayɛthwaʔ  
 waʔ-    ha-                    yɛthw    -aʔ  
 FACT-    3SG.M.AG-            plant    -PUNC  
 ‘He planted it.’
- b. aʔsehdeʔ waʔkhyadɔʔ  
 aʔsehdeʔ            waʔ-    k-                    hyatɔ    -ʔ  
 yesterday            FACT-    1SG.AG-            write    -PUNC

‘I wrote it yesterday.’

c. ɛhayɛthwaʔ

ɛ- ha- yɛthw -aʔ

FUT- 3SG.M.AG- plant -PUNC

‘He will plant (it).’

d. ɛgek

ɛ- k- ek -Ø

FUT- 1SG.AG- eat -PUNC

‘I will eat it.’

e. a:gek

a- k- ek -Ø

OPT- 1SG.AG- eat -PUNC

‘I would eat it.’

The one thing to note is that all verbal forms with the punctual aspect have a pre-pronominal prefix in (7). While these pre-pronominal prefixes are ruled out with the habitual and the stative aspects in simplex constructions, they are obligatory with the punctual. This is a well known fact of Iroquoian (Abbott 2000; Chafe 1960a, b, c, d, 1961; Froman et al. 2002; Lounsbury 1949, 1953; Michelson and Doxtator 2002; Woodbury 2003). Examples are shown in (8).

(8) a. ahse:deh \*(waʔ)hayenawaʔs

ahseteh waʔ- ha- yenawaʔs -Ø

yesterday FACT- 3SG.M.AG- help -PUNC

‘He helped yesterday.’

b. \* waʔhayenawaʔseh

waʔ- ha- yenawaʔs -eh  
FACT- 3SG.M.AG- help -STAT

Intended: 'He has/had helped.'

c. ɛʔhayenawaʔs/ \*hayenawaʔs

\*(ɛʔ)- ha- yenawaʔs -Ø  
FUT- 3SG.M.AG- help -PUNC

'He will help.'

d. \* ɛʔhayenawaʔsek/eh

ɛʔ- ha- yenawaʔs-ek/eh  
FUT-3SG.M.AG-help -HAB/STAT

Intended: 'He will have helped/will be helping.'

e. \* waʔhayɛθwas

waʔ- ha- yɛθw -as  
FACT- 3SG.M.AG- plant -HAB

Intended: 'He was planting (and has finished).'

f. \* hayɛθwaʔ

ha- yɛθw -aʔ  
3SG.M.AG- plant -PUNC

Intended: 'He planted/will plant it.'

Compare (8e) to (7a) and (8f) to (7c). These properties are summarized below.

- (9) a. punctual aspect requires a mood pre-pronominal prefix (future, factual, or optative)  
b. habitual and stative aspect prohibit a mood pre-pronominal prefix

At this point, the following questions arise: (i) What is the role of the punctual aspect and how does it differ from the stative and habitual? (ii) Why does the punctual require mood

pre-pronominal prefixes, while the stative and habitual cannot combine with these? (iii) We refer to these pre-pronominal prefixes as ‘mood’ above in line with traditional descriptions in the Iroquoianist literature, but do these prefixes actually instantiate tense or mood/modality?

For (i), the preliminary answer is that, unlike the habitual and the stative, which we have seen are instances of imperfective aspect, punctual denotes a situation viewed in its entirety, so, instantiates perfective viewpoint aspect. As for (ii), the data in (10) provide some insight:

(10) a. wa<sup>?</sup>eyęnęda<sup>?</sup>nha<sup>?</sup> gokhęnih  
 wa<sup>?</sup>- e- yęnęta<sup>?</sup>-nha<sup>?</sup> ko- khw- ęny -ih  
 FACT- 3SG.F.AG- finish -PUNC 3SG.F.PAT- food- make -STAT  
 ‘She finished cooking.’

b. \* wa<sup>?</sup>eyęnęda<sup>?</sup>nha<sup>?</sup> wa<sup>?</sup>ekhęnya<sup>?</sup>  
 wa<sup>?</sup>- e- yęnęta<sup>?</sup> -nha<sup>?</sup> kwa<sup>?</sup>- e- khw- ęny -a<sup>?</sup>  
 FACT- 3SG.F.AG- finish -PUNC FACT- 3.SG.F.PAT- food- make -PUNC  
 Intended: ‘She finished cooking.’

(10) shows that, while the punctual appears with ‘finish’, it cannot appear on the verb referring to cooking. The stative is required instead. While the event of finishing is punctual, the event of making food cannot be momentary, so must be durative. Since, following Smith (1991), non-durative/punctual situations present a “closed structure which appears at a point in time,” we can assume they need some manner of temporal anchoring.<sup>6</sup> In the next section,

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<sup>6</sup> A reviewer asks whether the punctual can appear on *cook* at all. It can, but then it refers to a completed event of cooking something, unlike in (10) where completion is encoded by *finish* rather than by *cook*. See (i) for an example.

i. gwasęhde<sup>?</sup> wa<sup>?</sup>hakhęnya<sup>?</sup>  
 gwasęhde<sup>?</sup> wa<sup>?</sup>-ha-khw-ęny-a<sup>?</sup>  
 last.night FACT-AG-food-make-PUNC  
 ‘Last night he cooked.’

we argue that, in Onondaga, temporal anchoring is realized via modality in conjunction with (im)perfectivity, rather than via tense<sup>7</sup>.

### X.2.2 Modality as temporal anchoring

There are three pre-pronominal prefixes in Onondaga, all illustrated in (7). At first glance the data in (7) might indicate that the factual morpheme expresses past tense, the future morpheme, future tense, and the optative morpheme, irrealis mood. Since both tense and mood seem to be involved, one could think of Onondaga as having a high Infl head in which tense and mood features merge (i.e., similar to English T, which hosts both tense and mood, typically in complementary distribution). It is perhaps unsurprising then that labelling varies between “tense” (see Lounsbury 1953, for Oneida) and “mood” (Baker and Travis 1997, for Mohawk, Chafe 1960a, b, c, d, 1961, for Seneca, Foster 1985, 1986). The facts discussed here suggest that a modal account is more likely to be on the right track given the division between realis (factual) and irrealis (optative and future).

A more careful investigation reveals that the factual modal prefix is not a past tense marker but rather indicates that the speaker knows that the event has happened for a fact. Since we are normally only sure about events that happened in the past, it typically has a past tense reading. However, it is not always the case that anteriority to the moment of speech is denoted. Also possible are: (i) a root/dynamic modal value, as in (11 a-b), (ii) a performative value, as in (12), and a (iii) factual/indubitable present tense value, as in (13).

- (11) a. waʔsgéʔ khèh neʔ jíhah?  
           waʔ- s-                    kẹ     -ʔ       khèh neʔ     jíhah  
           FACT- 2SG.AG-        see     -PUNC QU     NE     dog  
           ‘Did you see the dog?’ / ‘Can you/are you able to see the dog?’
- b. waʔhgéʔ neʔ sanqhsaʔ

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<sup>7</sup> See Jaszczolt (2009) on conceptualisations of temporal distinctions in terms of possibility and necessity.

wa<sup>2</sup>- k- kɛ -<sup>2</sup> ne<sup>2</sup> sanɔhsa<sup>2</sup>  
 FACT- SG.AG- see -PUNC NE your.house

‘I saw your house.’ / ‘I’m able to/can see your house.’ (right now)

(12) wa<sup>2</sup>gnihsɛːnɔh ne<sup>2</sup> shagoksdɛ<sup>2</sup>tshäː<sup>2</sup> dɛhse<sup>2</sup> hɔwahksdɛ<sup>2</sup>tshäː<sup>2</sup>

wa<sup>2</sup>- kni- hsɛn- ɔ -h ...  
 FACT- 1SG.AG:2DU.PAT- name- give -PUNC

‘I name you husband and wife.’

(13) gaɛ nɔːh hwa<sup>2</sup>he<sup>2</sup>

kaɛ nɔːh h- wa<sup>2</sup>- ha- e -<sup>2</sup>  
 which place TLOC- FACT- 3SG.M.AG- go/be -PUNC

‘Where is he going?’

In addition, forms with the factual mood prefix and the punctual aspect suffix are ruled out with negation, as seen in (14).

(14) a. hiya de<sup>2</sup>agokhɔnih

hiya te<sup>2</sup>- ako- khw- ɔny - ih  
 no NEG- 3SG.F.PAT- food- make -STAT

‘She didn’t cook’

b. \* hiya de<sup>2</sup>wa<sup>2</sup>ekhɔnya<sup>2</sup>

hiya te<sup>2</sup>- wa<sup>2</sup>- e- khw- ɔny -a<sup>2</sup>  
 no NEG- FACT- 3SG.F.AG- food- make -PUNC

An obvious question is whether it is the punctual or the factual that is incompatible with the negative. However, the data in (15) show that complementarity of distribution is between the factual modal prefix and negation and not between negation and punctual aspect<sup>8</sup>.

<sup>8</sup> Note in passing that HAB, on a par with the STAT, (12), and PUNC, (13), can also occur with negation; see (i) – this is unsurprising:

(15) hiya tha:yekhɔnyaʔ

hiya tha:- ye- khw -ɔny -aʔ  
no CONTR.OPT- 3SG.F.AG- food -make -PUNC

‘She might not cook.’

So, while temporal distinctions are clearly available in Onondaga (see also Baker and Travis 1995, for Mohwak), the factual does not represent an instance of past tense but rather denotes a necessarily true proposition, that is, one which is true in any circumstance and cannot be false. The default past tense interpretation of the factual and punctual combination follows in a straightforward manner once we acknowledge that Onondaga does not mark tense in these constructions. Following Smith (2007), perfective events are by default interpreted as past, while imperfective events are interpreted as present in “tenseless” languages. As such, the perfectivity of punctual aspect will automatically trigger a past tense interpretation, while the imperfectivity of the stative and the habitual will render the situation in the present.

We now need to account for the future and the optative morphemes. Foster (1985) argues that the future is more about probability and calls it a ‘predictive’ mood, while the optative expresses what the speaker thinks is desirable or possible, so has a more indefinite flavour to it (but see Baker and Travis 1995 for some counter-arguments). Neither express events that have happened, so can be true or false, which is why they can combine with negation. Our findings support the claim that both the future and the optative denote irrealis modality and seem to support the notion that future is predictive. Consider the data in (16).

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(i) hiya deʔekhɔnyahaʔ  
hiya teʔ- e- khw- ɔny -ahaʔ  
no NEG- 3SG.F.AG- food- make -HAB  
‘She never cooks.’

The future and optative refer to unrealized events and differ in the degree of certainty. The factual refers to realized or actual events only.<sup>9</sup>

(16) a.    ęsa:hahdę:dyaʔ

ę-       sa-     ha-                 ahtętyq       -aʔ  
 FUT-    REP-   3SG.M.AG-    leave           -PUNC

‘He will be going home.’ (‘predictive’ irrealis)

b.    he:heʔ ęsahahdę:dyaʔ

ha-                 eR     -heʔ    q-     sa-     ha-                 ahtętyq -aʔ  
 3SG.M.AG-     want   -HAB   OPT-   REP-   3SG.M.AG-     travel   -PUNC

‘he want’                                 ‘he might/may/could go home.’

‘He is planning on going home.’     (‘indefinite’ irrealis)

c.    sahohdędyqhá:dyeʔ

sa-     waʔ-   ho-                 ahtętyq       -h     -atye   -ʔ  
 REP-   FACT- 3SG.M.PAT-   travel           -STAT -CONT -PURP

‘He is going home.’ / ‘He is on his way home.’ (indubitable)

In sum, while sometimes labelled as tense, these pre-pronominal prefixes are best viewed as marking a realis-irrealis/factual-non-factual distinction, so are modal elements, rather than tense elements. This is reinforced by the linear order of the verbal morphology. Assuming that suffixation is a result of head movement, we can assume that the prefixes represent functional heads in the clausal spine that are higher than the position reached by verb movement. Thus, the modal prefixes are higher in the clausal spine than the aspect and extended aspect suffixes. Also, modality is typically associated with the CP layer rather than with the IP layer (D’Alessandro & Ledgeway 2010); while aspect is associated with the IP

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<sup>9</sup> This predicts that Onondaga forms such as *He will go home, but he might not get there* should be possible, since the future form in Onondaga is irrealis. We leave this to future research.

layer. Thus, at least in simplex aspectual constructions, temporal anchoring in Onondaga is realized either via the interaction of mood/modality and aspect (i.e. for perfectivity) or via the default present tense interpretation for imperfective aspect. Ultimately, what seems to be crucial for finiteness is the Comp-Infl relationship, which is often argued to guarantee temporal independence (e.g. Hill and Alboiu 2016).

### X.2.3 Complex Aspect Constructions

In addition to the simplex aspect constructions, Onondaga exhibits constructions where the habitual and stative can be augmented by suffixes referred to as the “habitual past” (HAB.PST) and the “stative past” (STAT.PST), respectively in the Iroquoianist literature. These are traditionally described as past tense morphemes. Semantically speaking, the data reveal that the habitual past is an imperfective past, see (17), while the stative past is either a perfective past or a past perfect progressive, see (18).<sup>10</sup>

- (17) a.      ẖwakẖony̱ṉhgwaʔ
- ẖwa-                      khw-    ɔny    -ɛni    -k    -kwaʔ
- 3SGF.AG:3SGM.PAT - food- make -BEN -HAB -HAB.PST
- ‘She used to cook for him.’
- b.      khenow̱khwaẖgwaʔ
- khe-                      now̱khw    -haʔ    -kwaʔ
- 1SG.AG:3SG.F.PAT- love                      -HAB -HAB.PST
- ‘I used to love her.’

<sup>10</sup> The STAT.PST can appear alongside the purposive too, as long as past perfectivity is implied, as in (i):

(i)      hadow̱theʔnaʔ

          ha-            atow̱t-        h-    eʔ- naʔ

          3SG.M.AG-hunt- DIS-PURP-STAT.PST

          ‘He had intended to hunt.’ (Woodbury 2003: 38)

The dislocative (DIS) is a future suffix meaning ‘going to’ and showing intention here (or movement, elsewhere); it is used with purposive aspect.

c. thayəthwasgwa?  
 t- ha- yəthw -as -kwa?  
 CLOC- 3SG.M.AG- plant -HAB -HAB.PST  
 ‘He used to plant.’

d. hada’gwa?  
 ha- t -a’ -kwa?  
 3SG.M.AG- stand -STAT -HAB.PST  
 ‘He was standing.’

(18) a. hɔwakhɔnyɛnihna?  
 hɔwa- khw- ɔny -ɛni -h -na?  
 3SGF.AG:3SGM.PAT- food- make -BEN -STAT -STAT.PST  
 ‘She had cooked for him.’

b. agida’wihna?  
 wak- ita’w -ih -na?  
 1.SG.PAT- sleep -STAT -STAT.PST  
 ‘I had been sleeping.’

c. shagoyəthwɛni:hna?  
 shako- yəthw -ɛni -ih -na?  
 3.SG.M.AG:3.PAT- plant -BEN -STAT -STAT.PST  
 ‘He had planted it for her.’

As was shown in section X.2.1, the habitual and stative cannot appear with modal prefixes. We suggest that this is due to their semantics. Imperfectives, as ongoing eventualities do not focus on the event as a whole unit, so cannot denote a necessarily actualized proposition. Recall that the factual indicates an actualized event. Consequently,

both FACT ... STAT and FACT ... HAB sequences are semantically impossible, so ruled out in the morphosyntax.

Unlike with the factive, imperfectives can appear with the future and the optative, provided their default realis connotation has been ‘annihilated.’ This can obtain in one of two ways: (i) either by adding the modalizer (MOD), as in (19), or by using a complex aspect construction, that is expanding the habitual and the stative with the habitual past and the stative past, respectively, as in (20)-(22). The examples under (19) further show that, unlike with the complex aspect constructions seen in (17)-(18), modal prefixes are obligatorily required when the modalizer is present, (19e), though, of course, the factual prefix is impossible, (19b).

- (19) a. dyęgwa<sup>?</sup> akhenowękhwak  
 tyękwa<sup>?</sup> a- khe- nowęhkw -ha<sup>?</sup> -ek  
 maybe OPT- 1SG.AG:3SG.F.PAT- love -HAB -MOD  
 ‘If I had loved her.’
- b. \* wa<sup>?</sup>khenowękhwak  
 wa<sup>?</sup>- khe- nowęhkw -ha<sup>?</sup> -ek  
 FACT- 1SG.AG:3SG.F.PAT- love -HAB -MOD
- c. ęgayęthwik  
 ę- ka- yęthw -ih -ek  
 FUT- 3SG.F.AG- plant -STAT -MOD  
 ‘It will have been planted.’
- d. ęhayęthwasek  
 ę- ha- yęthw -as -ek  
 FUT- 3SG.M.AG- plant -HAB -MOD

‘He will plant.’

e. \*hokhɔnihek

ho-                    khw-   ɔny   -ih   -ek  
3SG.M.PAT-   food-   make   -STAT   -MOD

f. ahɔwakhɔnyɛnihek

a-            hɔwa-                    khw-   ɔny   -ɛni   -h   -ek  
OPT-   3SG.F.AG:3SG.M.PAT-   food-   make   -BEN   -STAT   -MOD

‘She would be cooking for him.’

(20) Future habitual:

ɛhesninowɛkhwahgwa?                    (Woodbury, 2003: 716)

ɛ-            hesni-                    nowɛhkw            -ha?   -kwa?  
FUT-   2DU.AG:3.SG.M.PAT-   love                    -HAB   -HAB.PST

‘You two will be acting kindly towards him.’

(21) Future stative:

a.            ɛwageihna?

ɛ-            wak-                    ek            -ih            -na?  
FUT-   1.SG.PAT-            eat            -STAT   -STAT.PST

‘I might have eaten it’

b.            ɛwagegik

ɛ-            wak-                    ek            -ih            -ek  
FUT-   1SG.PAT-            eat            -STAT   -MOD

‘I will have eaten it.’

(22) Complex aspect with OPT modal prefix:

a. ahɔwakhɔnyɛnihnaʔ

a- hɔwa- khw- ɔny -ɛni -h -naʔ

OPT- 3SG.F.AG:3SG.M.PAT- food- make -BEN -STAT -STAT.PST

‘She should have cooked for him.’

b. ahesninowɛkhwahgwaʔ

a- hesni- nowɛkhw -haʔ -kwaʔ

OPT- 2DU.AG:3.SG.M.PAT- love -HAB -HAB.PST

‘You two should have loved him.’

#### X.2.4 Taking Stock

To summarize, the following generalizations hold with regards to the distribution of modal and aspectual affixes. The bare habitual and stative cannot appear with modal prefixes, while the punctual requires presence of a modal prefix. A modalizer stacked onto the habitual and stative enables these imperfective aspects to occur with the future and the optative. On the other hand, the habitual past and the stative past morphemes allow either the future or the optative to be present. Lastly, only the punctual may appear with the factual. We are now in a position to provide a full summary below.

(23) a. **no expanded aspect suffix**

aspect suffix

mood prefix

punctual

obligatory (factual, future, or optative)

habitual

none

stative

none

b. **modalizer expanded suffix**

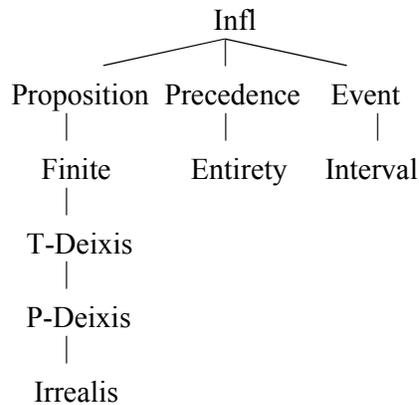
aspect suffix

mood prefix

punctual: incompatible with modalizer



(24)



In Cowper (2005) and Cowper and Hall (1999), the various concepts in (24) are monovalent features with syntactic or semantic content. [Event] distinguishes events (where this feature is present) from states (where this feature is absent). The feature [Interval], a dependent of [Event], encodes imperfective viewpoint aspect. A perfective event is a temporal point with no internal structure. These are the two aspectual features of Infl. Insofar as Tense is concerned, there is [Precedence], whose presence signifies that at least one moment of the event or state precedes the temporal anchor of the clause, and [Entirety], present when all moments of the event or state precede the temporal anchor.

The other features in (24) determine the clausal properties traditionally associated with mood. A proposition is taken to be a cognitive manifestation of a state or event. The feature [Proposition] takes an event or state and “transforms it into its cognitive manifestation by linking it to *consciousness*” (Hall 2001: 20). Since not all clauses are propositional, [Proposition] is an optional feature of Infl. Following Cowper (2005), [Finite], [Deixis], and [Irrealis] are its dependent features.<sup>12</sup> The feature [Finite] is purely syntactic; it licenses nominative Case and subject phi-features. The feature [Deixis] sets the temporal and or personal anchor of the clause to the deictic centre of the utterance/discourse. The temporal (i.e. T-Deixis) and personal (i.e. P-Deixis) indexing can be kept apart (e.g. Spanish) or

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<sup>12</sup> Though see Kyriakaki (2006) who proposes a different arrangement between [Proposition] and [Finite].

bundled together (e.g. English). Simplifying somewhat, the feature [T-Deixis] sets the temporal anchor to the Utterance Time/Time of Speech, while the feature [P-Deixis] is the set of propositions believed by the speaker (i.e. the consciousness). Lastly, the feature [Irrealis] establishes a marked relation between the proposition and the consciousness at the deictic centre.

### **X.3.2 INFL Features of Onondaga**

In this section, we discuss the featural properties of the various Onondaga Infl morphemes introduced in section 2 with a view to sketching a feature-geometric analysis for this Iroquoian language. We also assume Distributed Morphology (Halle and Marantz 1993), in which the syntactic component only manipulates features and Vocabulary Items are inserted cyclically, post Spell-Out, with a Vocabulary Item specified for most of the features winning out over a less specified Vocabulary Item at the insertion site.

We begin with a brief discussion of Onondaga clausal structure before moving on to a detailed discussion of the tense, aspect and mood morphemes. We assume the following clausal structure based on the verbal template.

Mood – Agr – incorporated noun – verb – ben/caus – asp – expanded aspect

CP > MoodP > TP > AspP > vP > VP

For this paper we do not concern ourselves with the location of agreement. Given the morpheme order above, we assume head movement takes place as high as T (expanded aspect, see below). This leaves the mood morpheme as a prefix. We also leave to future research exactly how prefixes morphologically fuse with the verbal complex. We now move on to the details of the aspect morphemes.

The first thing to note is that Onondaga disallows non-finite clauses and so, even non-propositional events are finite. This is illustrated in (25), which shows that the complement clause to a verb of sensory perception (i.e. a bare event) comes equipped with phi-features

and nominative Case. Note that (25) means that ‘he’ visually saw the event of a man sitting there.

- (25) hwaʔhogəʔ həgweh hatgodaʔ  
 h- waʔ- ho- kə -ʔ həkweh ha- tkod -aʔ  
 TLOC- FACT- 3.SG.M.PAT- see -PUNC man 3SG.M.AG- sit -STAT  
 ‘He saw a man sitting there.’ (Woodbury 2003: 1328)

Thus, since there is no contrast, we assume the feature [finite] is absent in this language (rather than being a dependent of the feature [Proposition]).

The habitual aspect appears with both states and (imperfective) events. As such it cannot be specified for the feature [Event]. In addition, within events it covers both homogenous events (*she’s teaching*) and non-homogenous events (*she teaches*) in the sense of Slavin (2008). Therefore, it also cannot be specified for the feature [Interval]. We suggest the habitual has no specific Infl features at all but rather spells out *v*. In other words, it is the default aspect marker. Thus, the Asp head, Tense head and Mood head will not have any features. Lack of [Precedence] is shown by example (26), as temporal adverbs are not compatible with the habitual morpheme. As such all three TAM domains will automatically have default interpretations (i.e. realis).<sup>13</sup>

- (26) \*ahse:deh hayenawaʔsek  
 ahseteh ha- yenawaʔs -ek  
 yesterday 3.SG.M.AG- help -HAB

Recall that stative aspect prototypically indicates a result state. Following Ramchand (2008), result events instantiate an ‘R’ head and are deeply embedded within the VP –

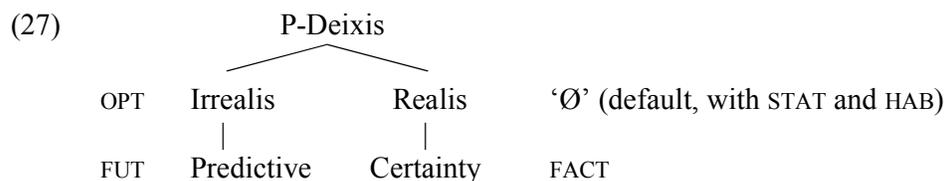
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<sup>13</sup> Note that Cowper (2005) argues the present tense in Spanish, which essentially covers the same imperfective meanings as the Onondaga HAB, has the feature P-Deixis. This cannot be the case for Onondaga as the HAB is not in complementary distribution with irrealis (i.e. FUT and OPT). Assuming Distributed Morphology (Halle and Marantz 1993), the more specified FUT/OPT should block insertion of HAB, contrary to fact.

crucially, lower than viewpoint aspect. Consequently, R competes for insertion with *v* and ‘wins’ because it is more specified. Just as with habitual aspect, this imperfective also has no specific Infl features. Given the perfective viewpoint aspect realized by the punctual, we assume it has the feature [Event], whose default reading is moment (Cowper, 2005). After head movement of *v* to Asp [Event], PUNC will be inserted over HAB as it is more specified.

Moving beyond aspectual features, we now address tense, namely the stative past and the habitual past. Recall that with the habitual past at least one point of the event must precede the utterance time. Also, with the stative past the entire event must precede the utterance time. We suggest, then, that the habitual past, which denotes imperfective in the past, is specified for the feature [Precedence], while the stative past is specified for the feature [Entirety]. In both these cases, since tense is deictic, the feature [T-Deixis] must be present in Mood, but we assume it piggybacks on [P-Deixis] as it can never occur on its own.

Regarding the mood node, we observed that all modal prefixes instantiate [P-Deixis] in Onondaga, as follows. The factual corresponds to a marked version of realis in that certainty is implied, while both the optative and the future instantiate irrealis, with future being more specific in that it is predictive. Consequently, we propose that a specified feature [P-Deixis] is always marked, either by the feature [Certainty], entailing [Realis], by [Predictive] entailing [Irrealis], or simply by [Irrealis]. However, this yields a split as in (27), rather than an entailment relationship between realis and irrealis.



Since this feature split is not possible from under the same node, we suggest that perhaps the feature [Irrealis] is realized in C, while the feature [Realis] is realized in Infl. Some support

for a hierarchy between these two features is found when looking at interaction of mood markers with other pre-pronominal prefixes. Consider (28) repeated from (16).

- (28) a.       $\text{ęsa:hahdę:dya}^?$   
            $\text{ę-      sa-      ha-                      ahtętyq      -a}^?$   
           FUT-    REP-    3SG.M.AG-    leave                    -PUNC  
           ‘He will be going home.’ (‘predictive’ irrealis)
- b.       $\text{sahohdędyqhá:dye}^?$   
            $\text{sa-      wa}^?-      ho-                      ahtętyq      -h      -atye    -}^?$   
           REP-    FACT-    3SG.M.PAT-    travel                    -STAT -CONT -PURP  
           ‘He is going home.’ / ‘He is on his way home.’ (indubitable)

Notice that the repetitive morpheme *sa-* follows the irrealis future mood marker in (28a) but, crucially, precedes the realis factual mood marker in (28b), suggesting that irrealis is higher than realis/factual.<sup>14</sup>

In conclusion, with respect to the Mood domain, we assume the following: (i) there is no Finite node (as mentioned above), (ii) there is [P-Deixis] with both realis and irrealis mood, and (iii) there may be [T-Deixis] complementing [P-Deixis]. Crucially, the deixis entailment is reversed from what Cowper (2005) observes for languages like English and Spanish, hence the ‘tenseless’ flavour of Onondaga. That is, since [T-Deixis] is not always present in finite clauses, no obligatory tense is required. This contrasts with English, where finite clauses are always specified for tense.

Recall further that the punctual, which is perfective, requires an anchor (traditionally a temporal anchor). We argued that in Onondaga this anchoring is realized by modality, which necessitates [P-Deixis]. Thus, perfectives are situated with respect to the speaker’s observations rather than to the utterance time. On the other hand, the stative and habitual, as

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<sup>14</sup> Note that Irrealis Mood is higher than Repetitive (Aspect) in Cinque’s (1999) hierarchy of projections too.

imperfectives do not need this anchoring, so do not necessitate [P-Deixis]. However, recall that there are situations in which the stative and habitual appear with irrealis modal prefixes in one of two contexts: (i) with the habitual past and with the stative past, and (ii) with the modalizer /-ek/. In situations involving (i), we assume that the feature [Precedence] removes the situation from the “now” so that [T-Deixis] becomes available. In situations involving the modalizer, we propose that this morpheme encodes the feature [General Tense]. By this we mean that it encodes the existence of a set of points related to the situation. We posit this feature on analogy with General Number (Corbett, 2000; Rullman & You, 2006). General Number refers to the lack of distinction between singular and plural. Crucially, it is not the absence of number, but rather the expression of number that simply does not distinguish between singular and plural. See the works cited for more information. We propose General Tense works much the same way. Specifically, General Tense indicates the existence of tense without specifying a value. We further assume that feature [General Tense] is inserted in the derivation to remove the situation from the default, hence its obligatory need for specific features of [T-Deixis], namely the [Irrealis] feature or the feature [Predictive].<sup>15</sup>

In sum, this yields (29) and the feature geometry for the Onondaga Comp-Infl as in (30). By positing [T-Deixis] as the most marked feature of [Irrealis], (30) correctly captures the empirical observation that no tense feature specifications are possible with the factual mood (i.e. [Certainty]) in Onondaga.

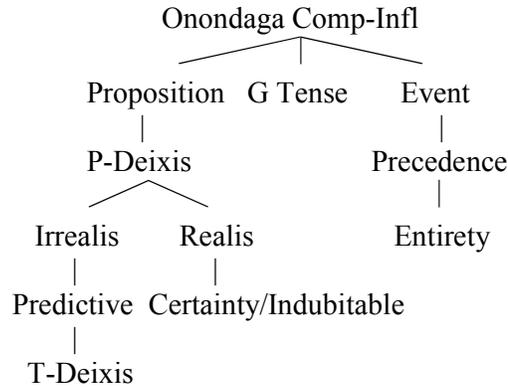
- (29) a. HAB: no Infl features,  $\nu$   
 b. STAT: no Infl features, R  
 c. PUNC: [Event]  
 d. HAB.PST: [Precedence] ([General Tense])

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<sup>15</sup> One difference between General Number and General Tense is that General Number can remain unspecified for singular or plural. General Tense, as we have described it here for Onondaga, must be specified by [T-Deixis]. We leave this fact to future research.

- e. STAT.PST: [Entirety] ([Precedence], [General Tense])
- f. FACT: [Certainty/Indubitable]([Realis],[P-Deixis], Proposition)
- g. OPT: [Irrealis] ([P-Deixis], [Proposition])
- h. FUT: [Predictive] ([Irrealis], [P-Deixis], [Proposition])
- i. MOD: [General Tense]

(30)



#### X.4 Conclusions

In this paper, following Cowper (2005) and Cowper and Hall (1999), we have laid out the foundation for a feature-geometric analysis of the mood/tense/aspect features in Onondaga. As with other non-Indo-European languages (see also Clarke, 2009, Slavin, 2008), a feature-geometric approach is better suited at handling Infl systems that are not ‘tense-centric’. Clearly, however, Onondaga is not really ‘tenseless’, but rather it does not employ tense as an obligatory feature of tensed clauses. Rather, aspect take the role of activating Infl. This is the result of [T-deixis] being located at the bottom of the feature geometry. It is this reversed hierarchy that we attribute the perceived lack of tense in Onondaga.

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