Clitics and the Left Periphery in Cayuga*

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We propose that pronominal markers in Cayuga are clitics that obey an updated version of the Tobler-Mussafia Law. Specifically, pronominal markers cannot appear at the left edge of an Intonational Phrase and undergo prosodic inversion at PF if they appear in that position at Spell-Out. This analysis has two important implications. First, we show that monomorphemic units in Cayuga are not uniformly particles, as is generally assumed. Rather, Cayuga opens up a new testing ground for the distinction between particles and clitics. Second, in order to motivate the analysis, a better understanding of the left periphery in Cayuga is developed. Specifically, the interaction between topics, *wh*-phrases and prosodic structure is mapped out, showing that the left periphery contains at least a Topic Phrase that dominates a Focus Phrase. Thus, this study sets the stage for a more detailed map of the clause structure in Cayuga.

Keywords: Iroquoian, prosody, clitic, particle, *wh*-movement

1. Introduction

In this paper, we discuss the morphosyntactic status of pronominal markers in Cayuga (Iroquoian > Northern Iroquoian). As in all Northern Iroquoian languages, it is well established in Cayuga that particles are an important part of the lexicon (Froman et al. 2002, Lounsbury 1949, among others). Clitics, on the other hand, have not played a major role in the discussion of the grammar of

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Northern Iroquoian languages.[1] The distinction between particles and clitics is not easy to pin down, and there is no clear consensus in the literature. Nevertheless, it is generally agreed upon that particles are more syntactically independent than clitics (Zwicky 1985). We show here that the 2nd person pronominal marker in Cayuga has the distribution of a Tobler-Mussafia clitic based on its interaction with *wh*-movement and topicalization.

Cayuga is a Northern Iroquoian language spoken in southern Ontario and neighbouring New York state. It is a highly endangered language with approximately 100 speakers; however, revitalization efforts are under way (Rice 2009: 55). Like other Northern Iroquoian languages, Cayuga is highly polysynthetic (Baker 1996) and is non-configurational (in the sense of Hale 1983). Word order is quite free, although we will see that Cayuga has both canonical *wh*-movement and exhibits constraints on the placement of particles and clitics.

We discuss the pronominal markers *ni:s* and *i:s* ('you') in this paper and examine how they interact with *wh*-movement. We propose that *ni:s* is a clitic and is subject to an updated version of the Tobler-Mussafia Law, which, in its original formulation, prohibits clitics at the beginning of a sentence (Mussafia 1886, Tobler 1875). This is in contrast to Wackernagel clitics, also discussed below, in which the clitic consistently appears in the second position of a given domain (Wackernagel 1892). For Cayuga, we propose that pronominal clitics cannot appear at the beginning of an Intonational Phrase and undergo *prosodic inversion* in the sense of Halpern (1995) if they appear in this location at PF. Other current analyses of Tobler-Mussafia and Wackernagel clitics are entertained, but none are able to capture the observed properties of the pronominal clitics in Cayuga.

The remainder of this paper is structured as follows. Section 2 contains a brief introduction of relevant properties of the Cayuga clause, including *wh*-movement, and prosodic structure. In section 3, we discuss particles and clitics in Cayuga. Section 4 discusses the interaction between *wh*-movement and particles/clitics. Section 5 presents our analysis. Section 6 is a brief conclusion.

2. The Cayuga clause

Going back to at least Hale (1983), the structure of discourse configurational languages had been previously argued to be flat.[2] Since that time, numerous

[1] A different kind of clitic appears on nouns (and sometimes on verbs) as enclitics. These have completely different properties from the clitics discussed here. See Michelson and Doxtator (2002: 12) for a basic description of such clitics in Oneida, a closely related Northern Iroquoian language.

[2] Hale did not use the term 'discourse configurational', but rather 'non-configurational' to

studies have converged on the conclusion that discourse configurational languages exhibit the same kind of hierarchical structure as more familiar configurational languages (Baker 1996, Barrie 2011, Barrie and Deer 2012, Davis 1997, Harley 2013, Jelinek 1984, Legate 2002, Reinholtz 1999 among many others). Following this line of inquiry, we adopt an articulated clausal structure for Cayuga. In this report, we motivate an articulated left periphery (in the sense of Rizzi 1997), as this is the location in which the crucial details of clitic placement are investigated. We also make some general comments on the prosodic structure of the clause.

We begin with a description of the morphosyntactic properties of Cayuga before delving into the actual structure of the clause. As in all Northern Iroquoian languages, the verb in Cayuga minimally consists of a verbal root, a prefix indicating subject and object agreement, and a suffix indicating aspect. Additionally, there may appear a prefix indicating mood and various derivational prefixes and suffixes (causative shown below). The template is as follows. See Froman et al. (2002) for more details on the morphology of the verbal complex.

(1) Mood–Agreement–Root–Causative–Aspect

Additional morphology is also found on the verbal complex, but a fuller discussion would take us too far afield. The following examples illustrate the structure of the verbal complex.[3]

(2) a. John a-ha:-k-Ø ne? swahyowa:?
John fact-3.sg.m.ag-eat-punc ne apple
'John ate an apple.' [Alfred Keye, speaker]
b. ę-hs-é:-tgi-ht-Ø
fut-2.sg.ag-epen-be.dirty-caus-punc
'You will dirty it up.' [Froman et al. p. 737]

describe languages with free word order. It has since been customary to use the former term as it more accurately describes the fact that word order in these languages relies more on information structure than on grammatical function.

[3] The following abbreviations are used here. Note that full glosses are not given on longer examples to save space. acc – accusative, ag – agent, ben – benefactive, caus – causative, cl – clitic, deg – degree, ds – dative subject, epen – epenthetic, f – feminine, fact – factive (a type of mood), fut – future, m – masculine, ne – a nominal particle in Northern Iroquoian languages, nt - neuter, pat – patient, punc – punctual (akin to perfective aspect), srfl - semireflexive, sg – singular, stat – stative (akin to perfect aspect), subj – subject, and tloc – translocative.

c. o-tgi-ʔ
3.sg.nt.ag-be.dirty-stat
'It is dirty.' [Froman et al. p. 575]

Finally, as mentioned above, word order is remarkably free in Cayuga, aside from the constraints on *wh*-movement discussed below. Thus, all six logically possible word order combinations of S, V, and O in (2a) above are acceptable.

Although the precise structure of the clause in Cayuga is an ongoing matter of investigation, we will adopt here the following structure, based on the discussion below.

(3) [$_{\text{ForceP}}$ [$_{\text{TopP}}$ [$_{\text{FocP}}$ [$_{\text{MoodP}}$ [$_{\text{TP}}$ [$_{\text{AspP}}$ [$_{v\text{P}}$ [$_{\text{VP}}$]]]]]

The split CP layer is the topic of the next section and will be taken up there. The remainder of the tree is based on Baker's (1985) Mirror Principle. Recall the order of the morphemes in the verbal complex in (1). Adopting the reasonable assumption that the causative head is associated with the *v*P layer, this order suggests the structure indicated in (3) along with head movement of the verbal root to Asp, as follows.[4]

(4) [$_{\text{TopP}}$ [$_{\text{FocP}}$ [$_{\text{MoodP}}$ [$_{\text{TP}}$ [$_{\text{AspP}}$ [V_i-*v*]$_j$-Asp [$_{v\text{P}}$ t_j [$_{\text{VP}}$ t_i]]]]]

This concludes the basic description of the clausal structure of Cayuga. We now turn to a discussion of *wh*-movement and topicalization in Cayuga, where we motivate the split CP layer.

2.1. *Wh*-movement and topics

Wh-movement is relatively understudied in Northern Iroquoian languages. Baker (1996: 66ff) discusses *wh*-movement in Mohawk and concludes that it is not significantly different from *wh*-movement in English. In particular, he shows that *wh*-movement invariably targets the left edge of the clause (though see below for qualification on this point), that *wh*-phrases can undergo long-distance movement, and that *wh*-movement is sensitive to standard islands in the sense of Ross (1967). Indeed, this section illustrates that Cayuga, like Mohawk, has canonical

[4] A reviewer asks if there is evidence for the head movement in (4) beyond the mirror effects as described. Unfortunately, typical verb raising diagnostics such as adverb placement as discussed by Pollock (1989) do not work for Cayuga as word order, including the order of adverbs, is quite free.

wh-movement which targets the Specifier of FocP (Barrie and Deer 2012). We bolster this claim by observing various properties of *wh*-questions in Cayuga, including long-distance *wh*-movement, *wh*-copy constructions, and interactions with topic and focus.

Despite the relatively free word order in Cayuga (as in Northern Iroquoian in general), *wh*-phrases appear only at or near the left edge of the clause. Consider the following examples. Observe that if the *wh*-phrase appears post-verbally, the sentence is ungrammatical.

(5) Dę̀ʔhoʔdę̀ʔ aʔehni:nǫ̀ʔ neʔ sanǫ:haʔ?
dę̀ʔhoʔdę̀ʔ aʔ- e- hninǫ -ʔ neʔ sanǫ:haʔ
what Fact- 3.Sg.F.Ag- buy -Punc Ne your.mother
'What did your mother buy?'

(6) *Aʔehni:nǫ̀ʔ dę̀ʔhoʔdę̀ʔ neʔ sanǫ:haʔ?
aʔ- e- hninǫ -ʔ dę̀ʔhoʔdę̀ʔ neʔ sanǫ:haʔ
Fact- 3.Sg.F.Ag- buy -Punc what Ne your.mother
('What did your mother buy?')

(7) *Sanǫ:haʔ aʔehni:nǫ̀ʔ dę̀ʔhoʔdę̀ʔ?
sanǫ:haʔ aʔ- e- hninǫ -ʔ dę̀ʔhoʔdę̀ʔ
your.mother Fact- 3.Sg.F.Ag- buy -Punc what
('What did your mother buy?')

Note, however, that the *wh*-phrase need not be strictly clause-initial. In the following example, the *wh*-phrase is pre-verbal, but is preceded by another element.

(8) Sanǫ:haʔ dę̀ʔhoʔdę̀ʔ aʔehni:nǫ̀ʔ?
sanǫ:haʔ dę̀ʔhoʔdę̀ʔ aʔ- e- hninǫ -ʔ
your.mother what Fact- 3.Sg.F.Ag- buy -Punc
'What did your mother buy?' / 'Your mother, what did she buy?'

A partial representation of Rizzi's cartography (Rizzi 1997) consists of ForceP > (TopP) > FocP.[5] Embedded clauses are optionally introduced by the particle

[5] In Rizzi's original proposal, there are multiple optional positions for the topic. The data below show that the topic appears above the *wh*-phrase in SpecFocP. Rizzi also proposes a FiniteP, which we do not discuss here. There are no non-finite forms in Cayuga. We speculate that the MoodP takes the place of FiniteP in Northern Iroquoian, but leave this topic to future research.

tsęh (Froman et al. 2002: 694), which we assume instantiates the head of ForceP.[6] This projection does not play a role in the forthcoming analysis, so we do not discuss it further.

(9) Agatshęnǫ:ni: tsęh ahsyǫh. (Froman et al. 2002: 694)
ak-at-shęnǫni-: tsęh ah-s-yǫ-h
1.Sg.Pat-Srfl-happy-Stat Comp Fact-2.Sg.Ag-arrive-Punc
'I'm happy you've arrived.'

Wh-phrases appear in SpecFocP. Although more recent investigations reveal a more highly articulated structure for different kinds of *wh*-phrases (Ko 2005, 2006, Rizzi 2001, Shlonsky and Soare 2011), we do not consider these here. We argue that the element that appears to the left of the *wh*-phrase is a topic, as suggested by the alternative English translation in (8). As has been observed, bare quantifiers cannot be topicalized (Cinque 1990, Rizzi 1986, 1997). Thus, if the element that appears to the left of the *wh*-phrase is a topic, we predict that bare quantifiers should be excluded from this position. The expression *gaegwe:gǫh* has the morphological structure of 'they all', but is typically translated as 'everyone'. Indeed, this form cannot appear to the left of the *wh*-phrase. Consider the following examples.

(10) Dę'ho'dę' gaegwe:gǫh agaehninǫnyǫ:'
what they.all they.bought.it
'What did they all buy?'

(11) *Gaegwe:gǫh dę'ho'dę' agaehninǫnyǫ:'
they.all what they.bought.it
('What did they all buy?')

Baker (1996) has argued in defense of his Polysynthesis Parameter that Mohawk (a Northern Iroquoian language closely related to Cayuga) does not have true quantifiers. Although a full discussion of quantification in Cayuga would take us too far afield, a few words here are in order in light of Baker's claim. His argument is based on the following observations about Mohawk. First, he notes that Mohawk *akwéku* ('they all', cognate with Cayuga *gaegwe:gǫh*) takes

[6] This particle has many other forms with a variety of functions that are not fully understood. See Froman et al. for several examples. It does not, however, introduce true interrogative clauses.

plural agreement rather than singular agreement (akin to English *all* vs. *every*). The same fact holds in Cayuga, as shown in (10). Second, he notes that the putative quantifier fails to trigger weak cross-over violations. Third, he notes that *akwéku* fails to show the same scopal effects of true quantifiers.

Concerning the first argument, as in Mohawk, the putative quantifier in Cayuga takes plural agreement (as shown in the examples above). However, we find the argument from number agreement weak at best since there is no reason we can find that a true universal quantifier must be singular (as in English). Note also that in colloquial English, universal quantifiers typically bind a plural pronoun (*Everyone lost their umbrella*).

Weak cross-over effects are absent in Cayuga just as Baker describes for Mohawk as in the following example (Baker 1996: 57).

(12) Akwéku wa'-t-huwati-noru'kwányu-' ne raotí-skare'.
all Fact-Duc-3.Pl.Ag:3.M.Pl.Pat-kiss-Punc Ne 3.M.Pl.Pat-friend
'Their[1] girlfriends kissed everyone[1].' (∀x, x's girlfriend kisses x)

It is not clear what intends this example to show, however. He is trying to demonstrate that Mohawk *akwéku* is more like English *all* (a putative non-quantifier) rather than like English *every*. It is not clear, however, that the English example Baker gives has a quantified reading to induce WCO. Consider the following data. The first example Baker (1996: 57) gives to show that *all*-phrases do not induce WCO effects. However, a non-quantified reading is available for this sentence in which the readers of the group of all critics expect that group of critics to be boring. Consider (13b), which is acceptable in colloquial English, and can only have a quantified reading because of the singular marking on the restriction to *all*. To be precise (13b) can only have the reading ∀x, x a boy, x loves x's mother. Consider now (13c) in this light. What we see is that when the quantified reading is forced by the singular restriction, WCO effects resurface. Thus, the absence of WCO in the Mohawk example does not provide an argument in favour of equating Mohawk *akwéku* with English *all* rather than *every*.

(13) a. Their[1] readers expect all critics[1] to be boring.
b. All boys[1] love their[1] mother.
c. ?Their[1] mother loves all boys[1].

This does not clear up the mystery as to why WCO effects are absent in

the Mohawk example (and in Northern Iroquoian in general), of course. We offer the following speculation, however. Lasnik and Saito (1991) discuss various situations in which WCO effects are alleviated to the point where they virtually disappear. It is possible that some other interfering property of Northern Iroquoian grammar has an alleviating effect of WCO; however, this speculation requires further research.

Finally, Baker discusses the scopal properties of *akwéku*. He starts with the observation that *all* in English can corefer with a pronoun outside of its minimal domain, while *every* cannot. He discusses the following data in support of this claim (Baker 1996: 56).

(14) a. *The guy who read every book[1] in the library says that it[1] is boring.
b. The guy who read all the books[1] in the library says that they[1] are boring.

While it is true that a generalized quantifier cannot bind a pronoun outside of this minimal domain, it can still corefer to pronoun. Thus, (14a) is ungrammatical because the quantifier cannot bind the variable as it does not c-command it. (14b) is fine, however. Consider, now, the following example.

(15) The guy who read every book[1] in the library says that they[1] are boring.

This has the same interpretation as (14b). That is, the pronoun *they* is not bound by the generalized quantifier; it merely refers to the set of books in the library. Thus, the generalized quantifier cannot bind a variable outside of its scope, but the DP quantified by the generalized quantifier can still co-refer with a pronoun outside of the scope of the quantifier. Thus, the examples Baker gives do not definitively show that the forms in question are not true quantifiers.

There is evidence, however, that there are quantifier-like elements that participate in scopal relations. Consider the following examples.

(16) a. Shogwanot aǫdęnyęndęʾ neʾ gwegoh gahnǫ́hohohyaʾ
someone tasted Ne every apple
'Someone tasted every apple.'
b. Shogwanot ihá:t neʾ gwegoh ganhoha:ʾ-hǫ́:weʾ
someone stood Ne every door-Loc
'Someone stood in front of every door.'

Under the most natural interpretation of these sentences (particularly (16b)), the putative universal quantifier takes wide scope. Given the scope bearing properties illustrated here, it is reasonable to assume that quantifiers exist in Cayuga, and that the ungrammaticality of (11) is due to the fact that a bare quantifier appears in topic position.

Another property of *wh*-movement or A-bar movement in general is that it is unbounded, giving rise to long-distance *wh*-questions. Long-distance movement in many languages provides evidence that such movement does not take place in one fell swoop, but is rather punctuated, proceeding in short, well-defined leaps. One well-known instance of this is the so-called *wh*-copy construction (McDaniel 1989, van Riemsdijk 1983). With these properties in mind, consider the following.

(17) Dę̀ʔhoʔdę̀ʔ ahę̀ʔ hyʔanih aʔehni:nǫʔ neʔ sanǫ:haʔ
what he.said your.father she.bought Ne your.mother
'What did your father say your mother bought?'

(18) Gaę̀hǫ:weh ise: haʔehni:nǫʔ onǫʔgwaʔ
gaę̀hǫ:weh ise: h- aʔ- e- hninǫ -ʔ onǫʔgwaʔ
where you.think Tloc- Fact- 3.Sg.F.Ag- buy -Punc milk
'Where do you think she bought the milk?'

(19) Do: niyohsno:weʔ a:gę̀ʔ sano:haʔ ahadʔedrehdo̲hae:ʔ hyʔanih?
do: niyo- ohsno:weʔ a:gę̀ʔ sano:haʔ
how Deg fast she.said your.mother
a- h- ad- ʔdrehd- ohae -ʔ hyʔanih
fact- 3.Sg.M.Ag- Srfl- car- wash -Punc your.father
'How fast did your mother say your father washed the car?'

(20) Dę̀ʔhoʔdę̀ʔ ahę̀ʔ hyʔanih dę̀ʔhoʔdę̀ʔ aʔehni:nǫʔ neʔ sanǫ:haʔ
what he.said your.father what she.bought ne your.mother
'What did your father say your mother bought?'

The first three examples above illustrate long-distance *wh*-movement. Example (19) is ambiguous between a local and long-distance reading; however, the long-distance reading was accessed more quickly by other speakers when asked. Although not common in free-flowing speech, example (20) also illustrates long-distance movement; however, a copy of the *wh*-phrase appears in the left edge of the embedded clause, in which the *wh*-phrase base originally merged.

Wh-movement in Cayuga also obeys well-known island constraints, including *wh*-islands and adjunct islands. Consider the following examples. In (21) the verb *honǫhdǫnyǫh* ('he wonders') introduces an interrogative complement clause, which is taken to be an island for extraction in many standard discussions of *wh*-movement (Huang 1982, Ross 1967). As (21b) shows, a *wh*-phrase cannot be extracted from the lower clause into the matrix clause.

(21) a. John honǫhdǫnyǫh sǫh aʔek neʔ swahyowaʔ.
John wonders who ate ne apple
'John wonders who ate the apple.'
b. *Dęʔhoʔdęʔ honǫhdǫnyǫh neʔ John sǫh aʔek
what wonders ne John who ate
('What does John wonder who ate?')

Turning now to (22), we see an adjunct *because*-clause, which again is an island for extraction cross-linguistically (see in particular Stepanov 2007). Again, (22b) shows that extraction from a *because*-clause adjuncts is unavailable in Cayuga.

(22) a. Haʔksa:ah ahahsdaę:ʔ shęh Mary aʔek neʔ ho:węh swahyo:waʔ
boy cried because Mary ate ne his apple
'The boy cried because Mary ate his apple.'
b. *Dęʔhoʔdęʔ haʔksa:ah ahahsdaę:ʔ shęh Mary aʔek?
what boy cry because Mary ate
('What did the boy cry because Mary ate?')

We conclude on the basis of the facts above that Cayuga has a split CP layer in which TopP appears above FocP in the functional hierarchy. This conclusion was reached on the basis of the relative order of the topic and the *wh*-phrase and the exclusion of bare quantifiers from topic position. The possibility of other functional projections was not investigated here. Furthermore, we showed that Cayuga has canonical *wh*-movement that targets a position in the left periphery of the clause, namely SpecFocP. In addition to the obligatory appearance of the *wh*-phrase at the left edge of the clause, Cayuga displays other prototypical properties of *wh*-movement such as long-distance movement and standard island effects, as well as *wh*-copy constructions, although these are infrequently attested.

2.2. Phrasal phonology

Investigations in phrasal phonology yield the following prosodic hierarchy (Nespor and Vogel 1986, Selkirk 1986): Utterance (U) > Intonational Phrase (IntP) > Phonological Phrase (PhonP) > Phonological Word. Crucial for our discussion is the IntP, which is defined as the domain over which an intonational contour is spread.[7] An IntP is usually uttered in one breath and contains no pauses. Parenthetical elements, such as non-restrictive relative clauses or other editorializing phrases (*by the way*, *as far as I know*, etc.) comprise separate intonational phrases.[8] *Wh*-phrases, however, do not form separate intonational phrases. Consider the following example.

(23) [$_{IntP}$ Dę̀ʔhoʔdę̀ʔ aʔehni:nǫ̀ʔ neʔ sanǫ́:haʔ?]
dę̀ʔhoʔdę̀ʔ aʔ- e- hninǫ -ʔ neʔ sanǫ́:haʔ
what Fact- 3.Sg.F.Ag- buy -Punc Ne your.mother
'What did your mother buy?'

Cinque (1990) and Rizzi (1986) argue that topics are intonationally distinct. We concluded in the previous section that material to the left of the *wh*-phrase is a topic. Indeed, such phrases are set off by a pause from the rest of the sentence. Thus, we have the following intonational structure for an interrogative clause with a topic.

(24) [$_{IntP}$ sanǫ́:haʔ] <pause> [$_{IntP}$ dę̀ʔhoʔdę̀ʔ aʔehni:nǫ̀ʔ?]
sanǫ́:haʔ dę̀ʔhoʔdę̀ʔ aʔ- e- hninǫ -ʔ
your.mother what Fact- 3.Sg.F.Ag- buy -Punc
'What did your mother buy?'

Thus, crucially for the forthcoming discussion, clause-initial topics constitute a distinct IntP from the rest of the clause. Other aspects of the prosodic hierarchy do not bear on the current discussion.

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[7] Details of the rest of the prosodic hierarchy are not important here. See, however, Dyck (2009) for an in-depth discussion on the PhonP and its relation to the notion of the 'word' in Cayuga.

[8] Note that the post-verbal subject in (23) may be set off by a pause, forming its own IntP. We assume this is related to the information structure of the clause, but leave this aspect to future research. The DP that appears before the *wh*-phrase in (24), however, is always set off by a pause.

3. Particles and clitics

While a clear cut distinction between particles and clitics is difficult to pin down (Zwicky 1985), particles tend to behave with more syntactic independence than clitics. We use the term 'particle' here in a general sense to refer to any small form without internal morphological structure. We argue below that some particles in Cayuga are actually more clitic-like in their behaviour. Particles are used to express a variety of grammatical properties in Cayuga (see Froman et al. 2002: 665). In addition, particles can undergo fusion in some situations. The following particles are germane to the discussion.[9]

(25) a. neˀ nominal particle related to specificity
b. i:s you
c. ni:s combination of *neˀ* and *i:s*
d. dęˀhoˀdęˀ what

The form *dęˀhoˀdęˀ* is actually a composite of two particles, *dęˀ* and *hoˀdęˀ*. The particle *dęˀ* can appear alone in casual speech.[10]

(26) Gwe: dęˀhoˀdęˀ e-swa-hninǫ-ˀ?
so what Fact-2.Pl.Ag-buy-Punc
'So, what did you (pl.) buy?'

(27) Gwe: dęˀ e-swa-hninǫ-ˀ?
so what Fact-2.Pl.Ag-buy-Punc
'So, what did you (pl.) buy?'

Phonological clitics have several standard diagnostics (Anderson 2005, Kayne 1975, Zwicky 1985). In comparison to particles, they are much less dependent and require a host of some kind. We review here several standard diagnostics of clitichood and apply these to some of the forms above. We will show that *i:s* has the status of a particle and that *ni:s* has the status of a clitic.

[9] Note that Froman et al. (2002) reports the second person marker as *i:hs* (and the fused form as *ni:hs*). In the third author's own speech, however, the /h/ is absent as shown in the data here.

[10] A reviewer asks whether *hoˀdęˀ* can be analyzed as *ho+dęˀ* given that *dęˀ* exists as a free form. While plausible, there is no evidence available that bears on this analysis one way or the other. Specifically, *ho* is not observed as a free or bound form elsewhere in the language. See example (33), too.

Kayne (1975) observes that pronominal clitics in French cannot be conjoined, as the following example illustrates.

(28) *Je le et la vois
I him.Cl and her.Cl see
'I see him and her.'

The following example shows that the fused form *ni:s* cannot be conjoined with a full DP, while the non-fused forms can.

(29) Dę̀ʰhoʰdę̀ʔ e-sni-hni:nǫ-ʔ i:s/neʔ i:s/*ni:s, John hniʔ?
what Fact-2.Du.Ag.buy-Punc you/Ne you/Ne.you, John with
'What did you and John buy?'

A defining property of clitics is that they cannot stand alone. Thus, the French pronominal clitic *le* ('him') cannot be used alone in response to a question such as 'Who bought the apples?' Likewise, the Cayuga form *i:s* can stand alone and the expression *neʔ i:s* can stand marginally stand alone. The form *ni:s*, however, cannot stand alone.

(30) i:s – can stand alone
neʔ i:s – can stand alone, marginally
ni:s – cannot stand alone

Finally, another well-known property of clitics is that they cannot bear emphatic stress. The French pronominal clitic *la* ('her') cannot bear stress. Rather, the form *elle* ('her') must be used. Likewise the form *i:s* can bear stress, but *ni:s* cannot.[11]

(31) i:s – can bear emphatic stress
neʔ i:s – can bear emphatic stress (on /i:s/)
ni:s – cannot bear stress

[11] There is one distinction between clitics in French and the clitics discussed here. Namely, clitics in French cannot bear any kind of stress at all or be focused. The clitic under discussion in Cayuga necessarily bears focal stress, but cannot bear heavy emphatic stress. Since Cayuga is a null argument language, the pronominal clitic appears only to indicate focus of some kind, and so bears some kind of associated stress. Nevertheless, this diagnostics still distinguishes the form *ni:s* from *neʔ i:s* and *i:s*.

Based on the diagnostics above, we conclude that *ni:s* is a phonological clitic while *i:s* is not necessarily a clitic (we return to this below). The form *dę ʔhoʔdę ʔ* ('what') is a composite of two particles. The particle *dę ʔ* can appear alone in interrogative contexts.

4. The interaction between *wh*-movement and particles/clitics

Having established the distinction between clitics and particles in Cayuga, we will examine the interaction between these elements and *wh*-movement. Since, as discussed in section 2, *wh*-phrases mark the left edge of the clause, they will help illuminate the distribution of clitics in Cayuga.

Recall that the form *dę ʔhoʔdę ʔ* ('what') is actually a composite of two particles, the first of which can appear alone. Furthermore, other particles and, as we show, clitics can appear between *dę ʔ* and *hoʔdę ʔ*. Consider the following data (Froman et al. 2002), where the clitic *ni:s* and the particle *hne:* intervene between *dę ʔ* and *hoʔdę ʔ*. Observe further that *hoʔdę ʔ* cannot be split (see footnote 10).

(32) Gwe: dęʔ ni:s hoʔdęʔ e-swa-hni:nǫ-ʔ?
so what you what Fact-2.Pl.Ag.buy-Punc
'So, what did you (pl.) buy?'

(33) a. Dęʔ hne: hoʔdęʔ
what in.fact what
'What, in fact...?'
b. *Dęʔhoʔ hne: dęʔ
what in.fact what
('What, in fact...?')

As with full DPs, non-*wh*-particles that appear at the front of the clause are interpreted as a topic.

(34) Gwe: neʔ John dęʔhoʔdęʔ a-ha-hni:nǫ-ʔ?
so Ne John what Fact-3.M.Ag.buy-Punc
'So, what did John buy?' / 'John, what did he buy?'

Furthermore, as illustrated above only particles and clitics can appear between *dę ʔ* and *hoʔdę ʔ*. Full DPs and clitic clusters cannot, as the following data show.

(35) *Gwe: dę? (ne?) John ho?dę? a-ha-hni:nǫ-??
so what ne John what Fact-3.M.Ag.buy-Punc
('So, what did John buy?')

(36) *Gwe: dę? ne? i:s ho?dę? e-swa-hni:nǫ-??
so what ne you what Fact-2.Pl.Ag.buy-Punc
('So, what did you (pl.) buy?')

Thus, the space between the two particles *dę?* and *ho?dę?* is reserved exclusively for clitics. Particle clusters and full XPs cannot appear here.

Observe next that the fused form *ni:s* cannot appear clause-initially (speech act particles notwithstanding). The non-fused form is improved in this position, but is still degraded.

(37) Gwe: *ni:s/?ne? i:s dę?ho?dę? e-swa-hninǫ-??
so Ne.you/Ne you what Fact-2.Pl.Ag-buy-Punc
'So, what did YOU (pl.) buy?'

We conclude that the pronominal marker ni:s is also a special clitic in the sense of Zwicky (1985). That is, its distribution is determined at least partly on its syntactic environment. Specifically, ni:s obeys the Tobler-Mussafia Law and cannot appear at the left edge of a clause, with qualifications to be sharpened below.

Recall from above that *ni:s* is a clitic, while it appears that *i:s*, a smaller form, is not. That is, *i:s* patterns with *ne? i:s*. The following data shed some light on this mysterious observation.

(38) Gwe: dę?ho?dę? ni:s/?*ne? i:s/i:s e-s-wa-hninǫ-??
so what Ne.you/Ne you/you Fact-2-Pl-buy-Punc
'So, what did you (pl.) buy?'

(39) Gwe: dę? ni:s/*ne? i:s/??i:s ho?dę? e-s-wa-hninǫ-??
so what Ne.you/Ne you/you what Fact-2-Pl-buy-Punc
'So, what did you (pl.) buy?'

Notice here that *i:s* patterns roughly with *ni:s*. Although *i:s* is degraded in (39), it is not ungrammatical as the presence of *ne? i:s* is. We suggest that the surface form *i:s* is ambiguous between a clitic and a particle.[12]

It is admittedly odd that the fusion of two particles gives rise to a clitic.

However, given the observation above that *i:s* is both a clitic and a particle, the fact that *ni:s* is a clitic is less surprising. Specifically, we propose that the clitic form of *neˀ* is simply *n*, and that it cannot appear in isolation. The surface forms are, then, either the particle cluster consisting of *neˀ* + *i:s* or the clitic cluster consisting of *n* + *i:s* → *ni:s*. Given that *i:s* is marginally possible in the interpolated position (inside the particle cluster *dęˀ* + *hoˀdęˀ*), we tentatively suggest that this is the clitic form of *i:s*, which can appear without *neˀ*/*n*.

5. Discussion

5.1. Introduction

We have argued above that Cayuga has canonical *wh*-movement. There is an articulated left periphery with a dedicated landing site for *wh*-phrases as follows ForceP > TopP > FocP > TP. As observed by Cinque (1990) and Rizzi (1997) for English and Italian, we have observed that topics in Cayuga are intonationally distinct and form their own IntP. Overt complementizers are not found in interrogative clauses, so we consider only the TopP and below. We give here a sample sentence with the syntactic and prosodic structures as shown.

(40) a. [$_{\text{TopP}}$ John [$_{\text{FocP}}$ dęˀhoˀdęˀ [$_{\text{TP}}$ ahahníŋˀ]]]
b. [[$_{\text{IntP}}$ John] [$_{\text{IntP}}$ dęˀhoˀdęˀ ahahníŋˀ]]

Given these structures, we see that the clitic cluster *ni:s* cannot appear at the left edge of an IntP. Consider the following examples, where the intonational phrases have been indicated following the discussion above.

---

[12] The fact that *i:s* is ambiguous between a clitic and a particle (essentially a non-clitic) is not too surprising. Note that French *lui* is both a clitic and a free-standing, non-clitic pronoun.

i. Je lui donne le livre
I to.him.Cl give the book
'I give the book to him.'
ii. C'est à lui que je donne le livre
It's to him.Pron that I give the book
'It's him I gave the book to.'

(41) [$_{IntP}$ Gonǫhdǫʾ gęh Mary]
she.know Q Mary
[$_{IntP}$ (*ni:s) dęʾ (ni:s) hoʾdęʾ (n:is) asni:nǫʾ (ni:s)]?
(Ne.you) what (Ne.you) what (Ne.you) you.bought (Ne.you)
'Does Mary know what YOU bought?'

(42) *[$_{IntP}$ John] [$_{IntP}$ ni:s dęʾhoʾdęʾ e-hya-hni:nǫʾ-s-Ø]?
John Ne.you what Fact-3.Sg.M.Ag:2.Sg.Pat-buy-Ben-Punc
('John, what did he buy YOU?')

(43) [$_{IntP}$ Nę:gyęh (*ni:s) so:wa:s] [$_{IntP}$ hwę:dǫh asni:noʾ]?
Dem Ne.you dog when you.bought.it
'This dog, when did you buy it?'

We account for these facts as follows. We assume the same general mechanism for the syntactic distribution of clitics and particles as for full DPs in Cayuga. That is, word order (and clitic order) is quite free (Baker 1996, Lounsbury 1949). Additionally, we propose that clitics are subject to an updated version of the Tobler-Mussafia Law. That is, they cannot appear as initial element in the 'sentence', where we interpret the notion of a sentence as an intonational phrase (IntP) (McCarthy and Prince 1986 [1999], Nespor and Vogel 1986).

5.2. Previous analyses of second position clitics

The exact mechanism to account for the distribution of clitics has been the matter of significant debate (see Spencer and Luis 2012 for extensive discussion). In his discussion of similar clitics in Serbo-Croatian (and other languages), Bošković (2001) outlines four potential approaches that have been proposed previously in the literature: the strong syntactic view, the weak syntactic view, the weak phonological view, the strong phonological view. We discuss these views in turn.

The strong syntactic view holds that the surface position of the clitic can be accounted for by syntactic operations alone. One recent purely syntactic approach holds that second position clitics in Armenian occupy second position within the phase (Kahnemuyipour and Megerdoomian 2011). Under this approach, the clitic left-adjoins to the phase head, which obligatorily contains some element in its specifier. Thus, the clitic appears in second position within the phase without recourse to phonological operations.

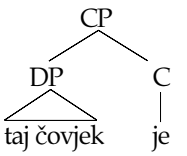
The weak syntactic view proposes that syntax is responsible for the

placement of clitics in their approximate surface positions. Phonological operations can move the position of the clitic to a small extent. PF presumably can access only phonological structure such as moras or feet, but not syntactic structure. Thus, long-distance movements are not expected at PF. This approach is investigated thoroughly by Halpern (1995). If the clitic appears initially in an IntP, it undergoes *prosodic inversion* at PF (Halpern 1995). This process is shown for the following Serbo-Croatian data (cited in Bošković 2001: 12). Observe that the second position clitic *je* can appear after the first phrase (2P position) or after the first word (2W position).

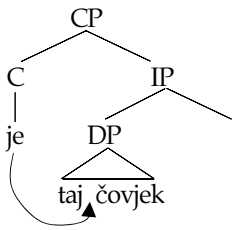
(44) a. Taj čovjek je volio Milenu.
that man is loved Milena
'That man loved Milena.'
b. Taj je čovjek volio Milenu.
that is man loved Milena
'That man loved Milena.'

Halpern posits the following rough derivations for the two structures above, respectively.

(45) a.



b.



In both cases, the clitic adjoins to the C head. In the first derivation, no further operations are required as the clitic does not appear at the left edge of the IntP (which is taken to be roughly co-extensive with the CP). In the second derivation, the clitic is at the left edge of the CP/IntP, so undergoes a PF process of prosodic inversion with the first phonological word and ends up intervening between the demonstrative and the noun (as shown by the arrow).

Bošković discusses various objections to Halpern's prosodic inversion analysis discussed in Progovac (1996) and Ćavar and Wilder (1994). First, he and the other authors cited note that the 2W position in (44b) is actually somewhat uncommon. They provide numerous examples where the clitic cannot intervene

between the first and second words of the first phrase. Here is one such example, where the clitic *su* cannot appear in 2W position.[13]

(46) *Tvoja su majka i Peter otišli
your are mother and Peter left
('Your mother and Peter left.')

This result is surprising under the prosodic inversion analysis. The authors also note that those instances where the 2W position is available to the clitic, the left element (the demonstrative in (44b)) can appear split from the rest of the constituent. Thus, the 2W instances Halpern offers can be explained by left-branch extraction. They conclude that there is very little evidence to support the need for the PF operation of prosodic inversion.

Bošković (2001) proposes the weak phonological view in which the syntax overgenerates a number of structures, which PF then proceeds to filter out.[14] He adapts Klavans' (1985) proposal that clitics are endowed with three lexical parameters that dictate their phonological distribution. Specifically, he argues that clitics in Serbo-Croation are lexically specified to appear at the left of an IntP and to be a suffix (enclitic) to a lexical host. He further proposes that when the clitic is in second position it undergoes Morphological Merger at PF so as to satisfy these two parametrically set options of Serbo-Croatian clitics. Clearly this approach will not work here since the clitic in question in Cayuga can appear in a number of spots within the intonational phrase. Bošković's proposal works well for clitics that consistently appear in a given location with respect to the intonational phrase.

Finally, the strong phonological view holds that all clitic placement takes place at PF. Under this view, clitics are not present in the syntax and are only inserted into the derivation at PF following the phonological rules of the

[13] A reviewer suggests that instead of prosodic inversion, examples such as (44b) arise by syntactic movement of *taj* alone. This dispenses with the need for the additional mechanism of prosodic inversion. This appears to work well for the Serbo-Croatian facts given, as Bošković explains, that *taj* is otherwise capable of left-branch extraction. Unfortunately, it would be difficult to implement this with the Cayuga data since it is unclear why the sub-constituent particle *dę'* would raise alone and strand *ho'dę'*. These two particles as a unit mean 'what'. It is also unclear where it would raise to, given that it is already in SpecFocP.

[14] Thus, this proposal does not adopt the Crash-Proof syntax approach advocated in Frampton and Guttmann (2002). Rather, it is in line with more recent approaches where the syntax generates structures consistent with its own properties. If certain derivations are illicit at PF or LF, they are either filtered out or subject to further processes (Costa 2004, Sato 2010). The prosodic inversion analysis presented here is consistent with these stronger conceptions of the interfaces.

language. This approach is unlikely to yield fruitful results in accounting for clitic placement in Cayuga. Recall that the clitic *ni:s* and the non-clitic form *ne' i:s* can appear in almost the exact same set of positions in the clause, except the left edge of an IntP, where the clitic is not found. It seems unlikely that one syntactic mechanism is responsible for the placement of non-clitic material (including both forms such as *ne' i:s* and full DPs) while another mechanism is responsible for clitic placement, with both mechanisms yielding almost identical results. Such approaches have garnered very little support, and we do not consider the strong phonological approach further.

5.3. Analysis of Cayuga clitics

Recall that the pronominal clitics obey an updated version of the Tobler-Mussafia Law. They cannot appear in the initial position of an IntP. In this section we account for the observed distribution of the pronominal clitic in Cayuga within the frame work of the analyses discussed in the previous section. Of the mechanisms discussed above, only the prosodic inversion approach readily captures the pattern of clitic placement observed in Cayuga.

First, the purely syntactic approach described predicts that the clitic can appear only in a restricted set of environments. Specifically, it predicts that the clitic can appear only in the second position of the phase, an observation that is clearly at odds with the Cayuga facts, as the clitic can appear in a wide range of places. Consider again the structure of the Cayuga clause.

(47) [$_{\text{TopP}}$ [$_{\text{FocP}}$ [$_{\text{MoodP}}$ [$_{\text{TP}}$ [$_{\text{AspP}}$ verbal complex [$_{v\text{P}}$ [$_{\text{VP}}$]]]]]

The purely syntactic proposal in Kahnemuyipour and Megerdoomian predicts that the clitic should appear only immediately to the right of the verbal complex (in Spec*v*P) or at the left edge of the clause (either immediately to the left of the topic or to the left of the focus/*wh*-phrase, if there is one, depending on which head in the split CP layer is taken to be the phase head). This prediction, of course, is not borne out. The clitic can appear in a number of places in the clause as the data have shown; furthermore, it *cannot* appear at the left edge of TopP, which is the prediction if Top is taken to be the phase head for the CP layer.

Bošković's weak phonological proposal also predicts that the clitic appears only in one spot in the clause based on the parameter settings. Regardless of whether the clitic is lexically specified as a prefix (proclitic) or suffix (enclitic),

the setting #__ predicts that it is found only at the left edge of an IntP, while the setting __# predicts that it is found only at the right edge. Again, the clitic is found in any one of a number of places in the IntP, except at the immediate left edge.

Both the strong syntactic approach and the weak phonological approaches capture the distribution of Wackernagel clitics as well. We have seen, however, that the pronominal clitics in Cayuga have the distribution of Tobler-Mussafia clitics. We propose that Halpern's mechanism of prosodic inversion captures the facts described here. In fact, it handles the situations that were problematic for Halpern's cases. Specifically, the clitic appears in a position otherwise unavailable to phrasal material. This is exactly where Halpern's analysis of Serbo-Croatian fails. The facts are represented in the following schematics.

(48)	Cayuga	Serbo-Croatian
	dę? clitic *ho?dę?*	*taj* clitic *čovek*
	dę? *XP *ho?dę?*	*taj* XP *čovek*

In Cayuga, the clitic appears between the two particles, *dę?* and *ho?dę?* ('what'), a position that is otherwise unavailable for phrasal material. In Serbo-Croatian, the clitic also intervenes between two elements, *taj* and *čovek* ('that man'); however, it was shown that this phrase could otherwise be split such that phrasal material does appear between the two. Thus, prosodic inversion, which is unnecessary for Serbo-Croatian, turns out to be the only viable option for Cayuga.

To spell the analysis out, we propose that the syntax can generate the following structure, with the clitic (such as *ni:s*) or a non-clitic XP (such as *ne? i:s* or *John*) in any of the positions shown. Note that we do not discuss what mechanisms are responsible for the surface word order here. In general the details governing the surface word order in Cayuga are still poorly understood. Crucially for the current analysis, we do not need to posit a different syntactic mechanism for the placement of clitics and the placement of XPs.[15]

(49) [$_{\text{IntP}}$ (clitic/XP) X (clitic/XP) Y (clitic/XP) Z (clitic/XP)]

[15] Baker's (1996) analysis of Mohawk (a Northern Iroquoian language closely related to Cayuga) is probably the most influential in the generative tradition. He proposes that overt arguments are freely adjoined to the clause and are coreferential with pronominal arguments in the clause. We have seen that topics and *wh*-phrases, at least, form part of the clausal architecture. A full analysis of the word order and information structure in Cayuga must await further research.

At PF, if the clitic appears at the left edge of the IntP, it undergoes prosodic inversion with the first element to its right. In the examples we have seen, this can be the particle *dę́ʾ* ('what') of the *wh*-phrase *dę́hoʔdę́ʾ* ('what'). Note that the element in question cannot simply be a syllable or a foot since the clitic never breaks up polysyllabic words at the left edge of an IntP. Dyck (2009) argues that particles in isolation constitute a phonological word but that particle clusters as a unit typically form a single phonological word. This conclusion is based on the observation that particle clusters usually receive a single word-level stress. Note, however, that *dę́hoʔdę́ʾ* ('what') does not follow this pattern as each particle retains stress: *dę́ʾ hoʔdę́ʔ*. We assume provisionally that prosodic inversion in Cayuga targets the first phonological word of the IntP.[16] In the following example, adapted and repeated from (41) above observe that the clitic *ni:s* appears after the first prosodic word.

(50) [$_{IntP}$ Gonǫhdǫʾ gę́h Mary] [$_{IntP}$ [$_{ω}$ dę́ʾ] ni:s [$_{ω}$ hoʾdę́ʾ] [$_{ω}$ asni:nǫʾ]]?
she.know Q Mary what ne.you what you.bought
'Does Mary know what YOU bought?'

Finally, we must still block the following configuration from (43), in which the clitic appears in the middle of a higher IntP.

(51) *[$_{IntP}$ ... ni:s (...)] [$_{IntP}$ dę́ʾhoʾdę́ʾ]

Coincidentally, the same configuration is blocked in Serbo-Croatian and other languages Bošković (2001) considers. Bošković argues for a constraint in which a clitic cannot move outside of its own IntP. We could simply adopt this suggestion here, but it is not unproblematic. Crucially, if the clitic is assumed to move in the overt syntax and prosodic structure is not formed until PF, there is no way for the clitic to know whether it is moving outside of a domain that will become an IntP after Spell-Out. Fortunately, another solution presents itself, at least for Cayuga. Overt pronouns in Cayuga (and in Northern Iroquoian in general) appear only to provide focus or emphasis; they can never be the topic of the clause. Recall further that only topics form a separate IntP. Thus, since the pronominal clitic is never the topic it can never appear outside the FocP, the lowest intonational phrase. The configuration in (51) is ruled out because it is

[16] A definitive answer to what unit prosodic inversion targets must await further research as the data concerning the behaviour of pronominal clitics with other particle clusters is lacking.

inconsistent with the informational structural constraints of the language.

6. Conclusion

We have argued that first and second person pronouns in Cayuga have the status of clitics when fused with the particle, *ne²*, but that both elements remain particles when unfused. Thus, the full form *ne² i:s* is a particle cluster of two individual particles, but the fused form *ni:s* is a clitic. Traditional diagnostics were employed to determine that the fused form is a clitic (Anderson 2005, Kayne 1975). We established that the left periphery of the Cayuga clauses contains a split CP layer in the sense of Rizzi (1997) and that Cayuga has standard *wh*-movement. Crucially, Cayuga has a specific landing site for *wh*-phrases and a separate landing site for topics, which are intonationally separate from the rest of the clause. We then investigated the behaviour of pronominal clitics with respect to the left periphery of the clause, demonstrating that such clitics resist the left edge of an IntP. That is, pronominal clitics in Cayuga obey the Tobler-Mussafia Law, if we take the domain of cliticization to be the IntP. Finally, we discussed various mechanisms that have been proposed in the literature for deriving the surface order of similar clitics, and concluded that Halpern's mechanism of prosodic inversion is the most appropriate choice to capture the observed facts in Cayuga.

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