Φ-FEATURES IN THE ONONDAGA AGREEMENT PARADIGM[*]

Michael Barrie
University of Toronto

This paper discusses the composition of the agreement marker in Onondaga and how agreement is manifested in that language. I show that the agreement marker consists of at least five independent morphemes indicating φ-features and Case. I illustrate several agreement asymmetries in Onondaga relating to person, number, some of which are dependent on grammatical function. I offer an analysis of these facts using Cyclic Agree (Rezac, 2003, 2004) and pre-specified probes (Béjar, 2003).

1. Introduction

This paper examines the pronominal agreement paradigm of Onondaga in light of recent proposals on asymmetric agreement patterns (Béjar, 2003; McGinnis, 2005; Rezac, 2003) and some recent proposals on the feature geometry of φ-features (Cowper, 2005; Cowper and Hall, 2005; Harley and Ritter, 2002; McGinnis, to appear). I propose that the Onondaga pronominal agreement marker is actually an amalgamation of up to five independent morphemes.[1]

(1)   gender-2nd person-case-1st person-number

Following a suggestion by Béjar that probes enter the derivation specified, I propose that both Agr^0 and Tr^0 (part of Bowers' (2002) split vP) both have probes for π, which are specified for 2nd person and 1st person respectively. I will show that this division of labour in checking φ-features explains the asymmetric agreement patterns found in Onondaga.

2. Structure of the Onondaga Agreement Morpheme

Before analyzing the agreement morpheme, I describe the structure of the verbal root in Onondaga. The root is preceded by mood markers (referred to as pre-pronominal prefixes in the traditional Iroquoian literature) and pronominal prefixes (the agreement morphemes). The verbal root is immediately followed by any derivational morphology, applicative morphemes, and aspect morphology (Lounsbury, 1953; Woodbury, 2003):

[1] I do not discuss Case in this paper.

(2)   mood-agreement-verb root-applicatives-aspect

Although the agreement morphemes are usually represented as mono-morphemic in many grammars, (Chafe, 1960a, 1960b) describes in detail the morphological breakdown of the these morphemes in Seneca, a closely related language. Following Chafe and given the data below, I suggest that the agreement markers are better thought of as a sequence of several morphemes. In (3)–(5) below I give several examples of agreement patterns in Onondaga. The full agreement paradigm is given in Appendix I.

(3)   *Sample of ransitive conjugation of* gẽ *('to see') – (agreement in* **bold***)*[2]

a.   **gō-**gẽha'
       1-see
       'I see you.'

b.   **s-g-e-**gẽha'
       2-1-EPEN-see
       'You see me.'

c.   **g-ni-**gẽha'
       1-DU-see
       'I see you two.'
       'We two see you (two).'

d.   **s-g-ni-**gẽha'
       2-1-DU-see
       'You see us two.'
       'You two see me/us two.'

e.   **g-wa-**gẽha'
       1:2-PL-see
       'I see you all.'
       'We two/all see you (two/all)'

f.   **s-g-wa-**gẽha'
       2-1-PL-see
       'You see us all.'
       'You two/all see me/us (two/all)'

g.   **he-s-**gẽha'
       MASC-2-see
       'He sees you.'

h.   **he-s-ni-**gẽha'
       MASC-2-DU-see
       'He sees you two.'

i.   **he-s-wa-**gẽha'
       MASC-2-PL-see
       'He sees you all.'

From the data in (3), we see that 1st person is always marked, while 2nd person is marked only if it is the external argument. That is a 1st person external argument blocks 2nd person agreement on the internal argument. 3rd person external arguments, however, do not block agreement with a 2nd person internal argument. I do not discuss π agreement morphology with only 3rd person arguments in this paper. The following table summarizes the π agreement

---

[2] Chafe (1960b) assumes that /s/ in (3)b, d, f is 2π, which is absent (or Ø) in the 1π→2π examples (a, c, e). See Heath (1998) for a more general discussion of this pattern.

morphology for both transitive and intransitive agreement patterns. The 3rd person agreement patterns are included for reference only.

Table 1 Person Agreement Morphology

Agent \ Patient	1	2	3.MASC.SG	3.NON-MASC.SG F.SG/F.PL/M.PL	Ø
1.EXCL		k	he/shak	khe	(ya)k
1.INCL			shet	ak	t
2	sk		hes	et	s
3.MASC	hak/shõk	hya/shes	hõwa	shako	ha
3.FEM	õk	esa/etsy	hõwa	yõtat/kõwa/ hõwa	ye
Ø	wak/yõk	s(a)	ho	yako/yo/ho	

2.1   Number Morphology

Here, we discuss number morphology in Onondaga. We show that, following Cowper (2005), plural is more marked than dual in Onondaga. Observe the following paradigm.

(4)   *Transitive conjugation of* gẽ *('to see') – 1st and 2nd person (agreement in **bold**)*

a.   **gõ**-gẽha'
1-see
'I see you.'

b.   **s-g-e**-gẽha'
2-1-EPEN-see
'You see me.'

c.   **g-ni**-gẽha'
1-DU-see
'I see you two.'
'We two see you (two).'

d.   **s-g-ni**-gẽha'
2-1-DU-see
'You see us two.'
'You two see me/us two.'

e.   **g-wa**-gẽha'
1:2-PL-see
'I see you all.'
'We two/all see you (two/all)'

f.   **s-g-wa**-gẽha'
2-1-PL-see
'You see us all.'
'You two/all see me/us (two/all)'

From these examples we see that there is one agreement morpheme for number, which can agree with either the subject or the object. If either argument is plural, then the plural morpheme appears. Otherwise, if either argument is dual, then the dual morpheme appears. Otherwise, (if both arguments are singular) no number morpheme appears. Crucially, if one argument is plural and the other is dual, then the plural argument wins out and determines agreement.

Consider now, the following data.

(5)   *Transitive conjugation of* gẽ *('to see') – 1ˢᵗ and 2ⁿᵈ person against 3ʳᵈ person (agreement in **bold**)*

a.   **he-Ø-**gẽha'
     3.SG.M-1-see
     'I see him.'

b.   **k-he-**gẽha'
     1-3.F/PL-see
     'I see her/them.'

c.   **há-k-**gẽha'
     3.SG.M-1-see
     'He sees me.'

d.   **yõ-k-**gẽha'
     3.SG.M-1-see
     'She sees/they see me.'

e.   **s-ha-g-ni-**gẽha'
     ?³-3.SG.M-1-DU-see
     'We two see him.'

f.   **(y)a-k-hi-**gẽha'
     3.F/PL-1-PL-see
     'We see her/them.'

g.   **s-ha-g-wa-**gẽha'
     ?-3.SG.M-1-PL-see
     'We all see him.'

h.   **s-hǫ-g-ni-**gẽha'
     ?-3.SG.M-1-DU-see
     'He sees us two.'

i.   **(y)ǫ-k-hi-**gẽha'
     3.F-1-PL-see
     'She/someone sees us.'

j.   **s-hǫ-g-wa-**gẽha'
     ?-3.SG.M-1-PL-see
     'He sees us all.'

k.   **he-s-**gẽha'
     3.SG.M-2-see
     'You see him.'

l.   **s-he-**gẽha'
     2-3.F/PL-see
     'You see her/them.'

m.   **h-y-a-**gẽha'
     3.SG.M-2-ACC-see
     'He sees you.'

n.   **(y)e-s-a-**gẽha'
     3.F/PL-2-ACC-see
     'She sees/they see you.'

o.   **he-s-ni-**gẽha'
     3.SG.M-2-DU-see
     'You two see him.'

p.   **(y)e-tsh-hi-**gẽha'
     3.F/PL-2-PL-see
     'You two/all see her/them.'

q.   **ha-s-wa-**gẽha'
     3.SG.M-2-PL-see
     'You all see him.'

---

³ This morpheme, /s/, shows up in most, but not all instances where one argument is 1ˢᵗ person and the other is 3ʳᵈ person, and at least one of the arguments is plural. It is unclear what the function or meaning of the morpheme is.

r.   **s-he-s-ni-**gẽha'   s.   **(y)ǫ-k-hi-**gẽha'
             ?-3.SG.M-2-DU-see   3.F-1-PL-see
             'He sees you two.'   'She/someone sees you.'

t.   **s-he-s-wa-**gẽha'
             ?-3.SG.M-2-PL-see
             'He sees you all.'

Here, we see that, if one of the arguments is 1st or 2nd person, the verb must agree in number with that argument. Number agreement with a 3rd person argument takes place only if there are no 1st or 2nd person arguments. Furthermore, if both arguments are 3rd person and one of them is 3rd person, masculine and singular, there is no number agreement, regardless of the other argument. These facts on number agreement are summarized in the following tables.

Table 2 Number Morphology I

Both arguments 1st & 2nd person	singular	dual	plural
singular	no agreement		
dual	dual agreement		
plural	plural agreement		

Table 3 Number Morphology II

Both arguments 3rd person	no patient	masc.sing	fem.sing	fem.plural	masc. plural
no agent	—	no agr	no agr	plural	
masc.sing					
masc.dual	dual		plural		
masc.plural	plural				
fem.sing	no agr		no agr	plural	
fem.dual	dual		plural		
fem.plural	plural				

2.2   Gender Morphology

Onondaga contrasts masculine singular with non-(masculine singular) in many instances. That is, feminine singular, feminine plural and masculine plural are often syncretic, in opposition to masculine singular. Consider the following examples.

(6)   *Transitive conjugation of* gẽ *('to see') – gender agreement with 3rd person (agreement in **bold**)*

a. **há-k-**gẽha'   b. **yõ-k-**gẽha'
   3.SG.M-1-see   3.SG.M-1-see
   'He sees me.'   'She sees/they see me.'

c. **he-s-ni-**gẽha'   d. **(y)e-tsh-hi-**gẽha'
   3.SG.M-2-DU-see   3.F/PL-2-PL-see
   'You two see him.'   'You two/all see her/them.'

e. **ha-s-wa-**gẽha'
   3.SG.M-2-PL-see
   'You all see him.'

Thus, there is a morpheme to the left of the 2nd π agreement marker for gender.

In sum, we have indicated 5 morphemes that make up the agreement marker in Onondaga, repeated here.

(7)   gender-2nd person-case-1st person-number

Additionally, there is a morpheme with the shape, /s/, whose function and meaning is still unclear.

3.   Analysis

This analysis assumes an articulated feature geometry for φ-features. Also, I assume a Gen(der)P(hrase), following (Linn and Rosen, 2003). Linn & Rosen argue that in subject split languages, there is more than one functional projection in which agreement features are checked. I will capture the asymmetric agreement facts above, if we assume here that 1st and 2nd π arguments are checked in separate functional projections (where π and # may be checked on different arguments). 3π arguments are not true persons, and are checked in GenP, which probes for a gender feature. McGinnis (to appear) modifies . I also assume the geometry for number as presented in (Cowper, 2005).

Furthermore, I assume that feature agreement takes place by Match and Value and that agreement need not take place immediately when the probe is merged with the derivation. In other words, the search domain for a probe can expand after the probe is part of the tree (Béjar, 2003; Chomsky, 2000, 2001; Rezac, 2003, 2004). I also follow Béjar and assume that probes can enter the derivation specified.

Consider first number agreement with 1st and 2nd persons. Recall that plural marking is preferred. Suppose further that the probe for number is on the head that introduces the external argument and is specified as plural.

I assume the following clausal structure for Onondaga:

(8)   MoodP > GenP > AgrP > PrP > TrP > AspP > VP

GenP is the locus of agreement for 3rd persons. AgrP check agreement for the subject. PrP and TrP are Bowers' (2002) split vP.[4] PrP checks accusative Case and TrP introduces the external argument. Tr^0 also probes for the φ-features on the object. MoodP and AspP will not play a role in the discussion here, so I omit them in the structures that follow. I assume the following feature specifications for the probes:
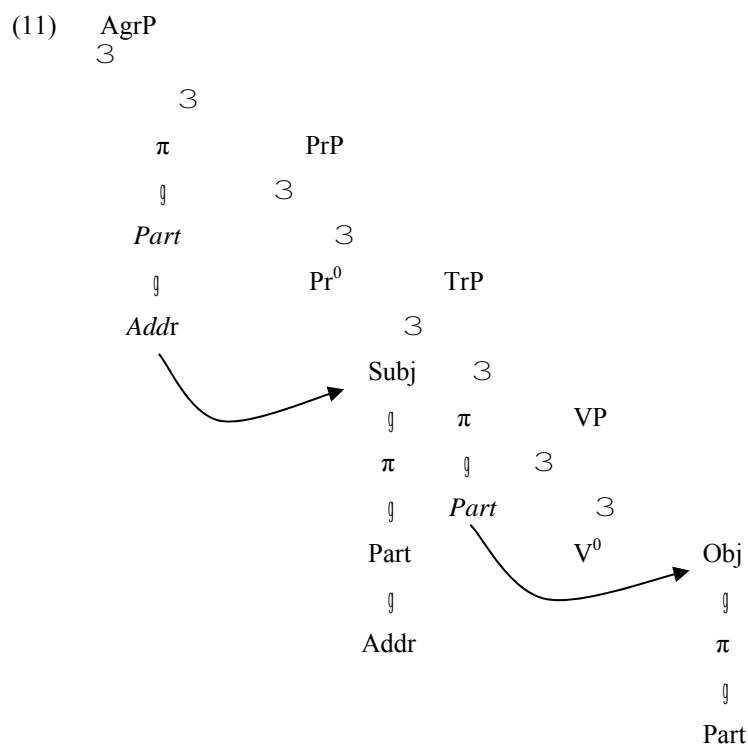
(9)　　　Agr^0　　　　　　　　Tr^0
　　　　　　⇓　　　　　　　　　　⇓
　　　　　Part　　　　　　　　Part
　　　　　　⇓
　　　　　Addr

　　　We can now understand the asymmetry in subject/object agreement with 1st and 2nd persons as follows. First, recall that 2nd person agreement is found only when the subject is 2nd person. I repeat here the relevant data:

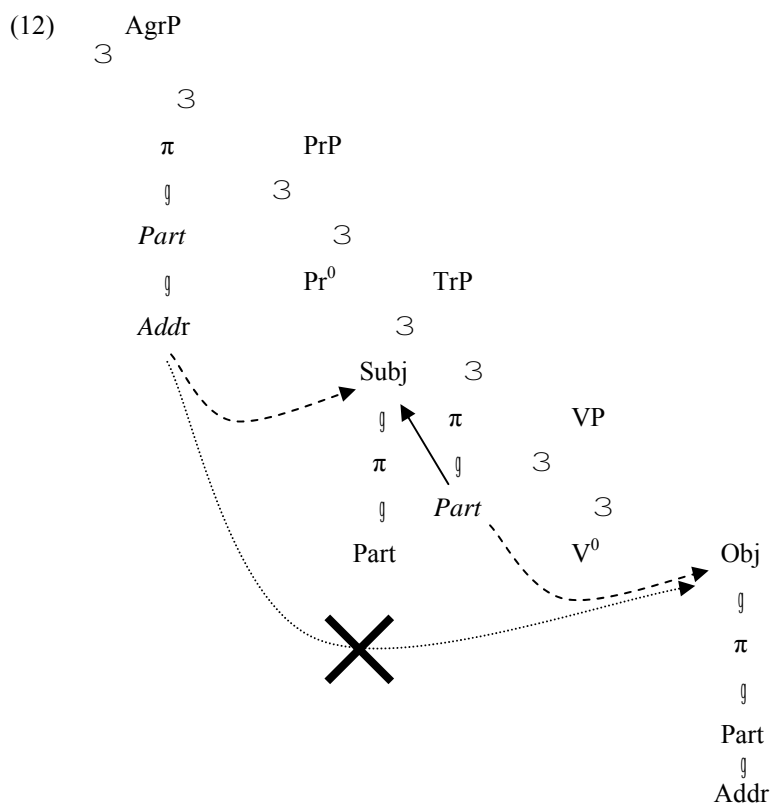(10)　　*Transitive conjugation of* gẽ *('to see') – 1st and 2nd person (agreement in **bold**)*

a.　　**g-ni**-gẽha'　　　　　b.　　**s-g-ni**-gẽha'
　　　1-DU-see　　　　　　　　　2-1-DU-see
　　　'I see you two.'　　　　　　'You see us two.'
　　　'We two see you (two).'　　　'You two see me/us two.'

First, let's go through the derivation for (10)b. Tr^0 enters the derivation and merges with AspP (not shown). Tr^0 has an uninterpretable person feature, [$u\pi$], which is specified with a bare Participant node. This probe searches out a goal and finds the direct object, which matches and values the probe (solid arrow), and we get first person agreement. The external argument is then merged into the derivation. Eventually, Agr^0 enters the derivation with an [$u\pi$] feature, which is specified with a Participant node with an Addressee feature. This feature probes for a goal and finds the subject. Again the subject matches and values the probe, and we get 2nd person agreement.
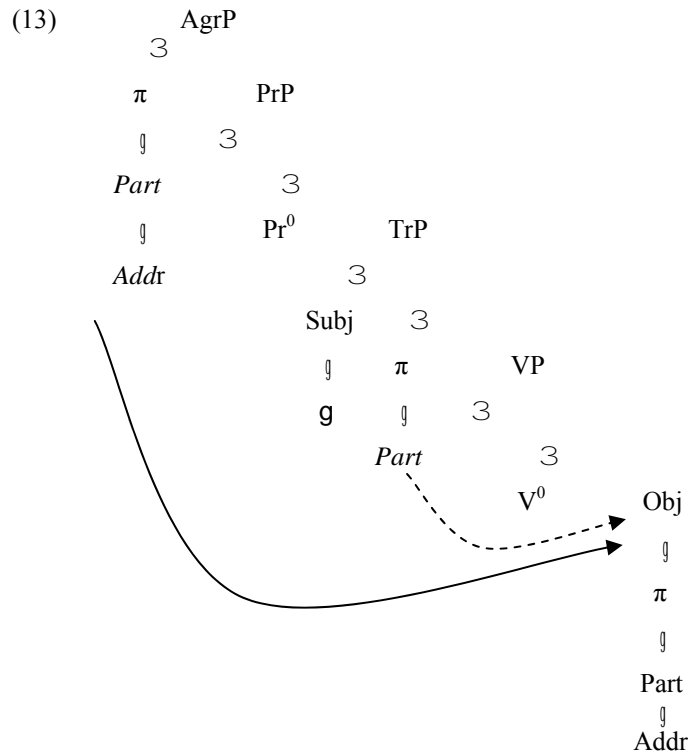
---

[4] Note that PrP and TrP are reversed from the order assumed by Bowers. I offer no justification at this time. If one assumes the standard hierarchy for these two projections, perhaps the morpheme order is accounted for either by head movement or by rearrangement of the morphemes within a Distributed Morphology framework.

(11) AgrP

π   PrP

Part   Pr⁰   TrP

Addr   Subj

Pr⁰ ... Subj   π   VP

π   Part

Part   V⁰   Obj

Addr   Obj

π

Part

Now, for (10)a, when the $[u\pi]$ feature on Tr^0 probes for a goal, it finds the 2nd person direct object, as shown in (12). The direct object matches, but does not value the probe (dashed line). When the external argument is merged in SpecTrP, it values the probe, and we get 1st person agreement (solid line). When Agr^0 is merged in, the $[u\pi]$ feature probes and finds the subject, which matches, but does not value (dashed line) because the subject is inactive as a goal. The $[u\pi]$ feature on Agr^0 cannot be valued by the object, since the subject blocks this relation. Thus, only 1st person agreement arises in this case.

(12)   AgrP
       ⟋⟍
          ⟋⟍
     π   PrP
     ◊   ⟋⟍
   Part   ⟋⟍
     ◊   Pr⁰   TrP
   Addr   ⟋⟍
              Subj   ⟋⟍
                ◊   π   VP
               π   ◊   ⟋⟍
                ◊   *Part*   ⟋⟍
              Part   V⁰   Obj
                                    ◊
                                    π
                                    ◊
                                  Part
                                    ◊
                                  Addr

Recall now that a 3rd person external argument does not block 2nd person agreement on an internal argument. We can understand this as follows. In (13), we have a 3rd person subject and a 2nd person object. The probe on Tr^0 matches the internal argument, but is not valued by it. The probe on Agr^0 is matched and valued by the internal argument. The external argument does not block this relation since, by hypothesis, 3rd person arguments do not have a π feature. The [ug] feature on Gen^0 (not shown) probes for an [ig] feature. It matches with and is valued by the external argument.

(13)   AgrP
        ⠒⠒
     π   PrP
     ⫾   ⠒⠒
   Part   ⠒⠒
     ⫾   Pr⁰   TrP
   *Add*r   ⠒⠒
                 Subj   ⠒⠒
                  ⫾   π   VP
                  g   ⫾   ⠒⠒
                    Part   ⠒⠒
                        V⁰   Obj
                                   ⫾
                                   π
                                   ⫾
                                  Part
                                   ⫾
                                  Addr

Next, we discuss number agreement. Again, recall that plural is preferentially marked over dual. Furthermore, McGinnis (2005) argues that competition for φ-features that is not dependent on position (i.e., subject and object) should be handled by the morphology. Indeed, a morphological explanation is by easier to implement here. Given the Subset Principle, we must assume (following Cowper, 2005) that plural is more marked than dual. Thus, I assume the following structures for the dual and plural morphemes with the corresponding exponents (allomorphy aside).

(14)   a.   dual <==> /ni/   b.   plural <==> /wa/
                         ⫾   ⫾
                        >1   >1
                                                          ⫾
                                                         >2

When these two morphemes compete for insertion, the more highly specified morpheme with the appropriate features will win.

4.   Conclusions

I have argued that agreement markers in Onondaga are actually an amalgamation of several morphemes, including gender, number, person, and

Case. Furthermore, not all φ-features are present on any given marker. 1st person subjects, for example block agreement with a 2nd person object, but not vice versa. 3rd person subjects, however, do not block agreement with a 2nd person object. I proposed an analysis in which this agreement pattern can be explained if we assume Cyclic Agree (Rezac, 2003, 2004) and split φ-agreement (Béjar, 2003). Number agreement, on the other hand, is not dependent on position (subject vs. object) and hence was given a morphological explanation, in which it was shown the plural is more marked than dual (Cowper, 2005).

Appendix I

The following charts represent the entire agreement paradigm for a transitive verb stem beginning with a consonant. This paradigm is based on my field work in Six Nations. Gaps in the paradigms were filled in by Woodbury (2003) and are marked with a *.

Agent \ Patient	1sg	1du	1pl	2sg	2du	2pl
1sg				kõ	kni	kwa
1du.excl				kni	kni	kwa
1pl.excl				kwa	kwa	kwa
2sg	sk	skni	skwa			
2du	skni	skni	skwa			
2pl	skwa	skwa	skwa			
3Neut, Ø	wak	yõkni	yõkwa	sa	sni	swa
3Msg	hak	shõkni	shõkwa	hya	shesni	sheswa
3Fsg	õk	õkhi	õkhi	esa	etchi	etchi
3Fdu/pl	õk	õkhi	õkhi	esa*	etchi	etchi
3Mdu/pl	hõk	õkhi	õkhi	esa*	etchi	etchi

Agent \ Patient	3Neut, Ø	3Msg	3Fsg	3Fdu/pl	3Mdu/pl
1sg	k	he	khe		
1du.excl	yakni	shakni	akhi		
1pl.excl	yakwa	shakwa	akhi		
1du.incl.	tni	shetni	ethi		
1pl.incl	twa	shetwa	ethi		
2sg	s	hes	she		
2du	sni	hesni	etchi		
2pl	swa	heswa	etchi		
3Neut, Ø		ho	yako	yoti	hoti
3Msg	ha	hõwa	shako		
3Fsg	ye	hõwa	õtat	gõwati	hõwati
3Fdu/pl	kni/kõti	hõwa	(a)koti		

Patient / Agent	3Neut, Ø	3Msg	3Fsg	3Fdu/pl	3Mdu/pl
3Mdu/pl	hni/hati	hõwa	shakoti		

References

Béjar, Susana. 2003. Phi-Syntax: A Theory of Agreement. Doctoral Dissertation, University of Toronto.

Bowers, John. 2002. Transitivity. *Linguistic Inquiry* 33:183-224.

Chafe, Wallace. 1960a. Seneca Morphology II: Irreducible nouns and verbs; the modal verb. *International Journal of American Linguistics* 26:123-130.

Chafe, Wallace. 1960b. Seneca Morphology III: Expanded pronominal prefixes. *International Journal of American Linguistics* 26:224-233.

Chomsky, Noam. 2000. Minimalist Inquiries: The Framework. In *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*. eds., Roger Martin, D. Michaels and Juan Uriagereka, 89-156. Cambridge, MA: MIT Press.

Chomsky, Noam. 2001. Derivation by Phase. In *Ken Hale: A Life in Language*. ed. Michael Kenstowicz, 1-52. Cambridge, MA: MIT Press.

Cowper, Elizabeth. 2005. A Note on Number. *Linguistic Inquiry* 36:441-455.

Cowper, Elizabeth, and Daniel Currie Hall. 2005. The Pieces of Pi. In *Proceedings of the 2004 Canadian Linguistics Association Annual Conference*, eds. Marie-Odile Junker, Martha McGinnis and Yves Roberge, 12 pages.

Harley, Heidi, and Elizabeth Ritter. 2002. Person and number in pronouns: a feature-geometric analysis. *Language* 78:482-526.

Heath, Jeffrey. 1998. Pragmatic skewing in 1(to)2 pronominal combinations in Native American languages. *International Journal of American Linguistics* 64:83-104.

Linn, Mary S., and Sara Thomas Rosen. 2003. The Functional Projections of Subject Splits. In *The Role of Agreement in Natural Language: TLS 5 Proceedings*. ed. W. E. Griffin, 135-146: Texas Linguistic Forum, 53.

Lounsbury, Floyd Glenn. 1953. *Oneida Verb Morphology*. New Haven, CT: Yale University.

McGinnis, Martha. 2005. Phi-feature competition in morphology and syntax. Ms., University of Calgary.

McGinnis, Martha. to appear. On markedness asymmetries in person and number. *Langauge* 81.

Rezac, Milan. 2003. The Fine Structure of Cyclic Agree. *Syntax* 6:156-182.

Rezac, Milan. 2004. Elements of Cyclic Syntax: Agree and Merge. Doctoral Dissertation, University of Toronto.

Woodbury, Hanni. 2003. *Onondaga-English/English-Onondaga Dictionary*. Toronto, ON: University of Toronto Press.