Fission in Algonquian and the status of morphological templates

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Abstract: This paper argues that the ordering of slots in the Algonquian verb inflection template reflects a combination of syntactic and morphological principles. The overall order of slots parallels the order of functional heads in the syntactic structure. However, not every slot corresponds to a distinct syntactic terminal. Some terminals undergo fission (Noyer 1992), giving rise to situations in which a sequence of morphological slots corresponds to a single syntactic terminal. The paper proposes a syntax-morphology mapping for all of the slots in the Algonquian verb inflection template, distinguishing slots that realize distinct syntactic terminals from slots that realize the same terminal via fission. Several criteria that can help to distinguish between these alternatives are suggested.

Keywords: morphology, inflection, templates, fission, Algonquian

1 Introduction

This paper defends two proposals about the Algonquian verb inflection template, and, by extension, about inflectional templates in general. The first proposal is that the order of slots in the template corresponds to the order of functional heads in the syntax. This is not a new idea (see Halle and Marantz 1993 for Potawatomi and much subsequent work), but I will argue for one particular view on how the syntax-morphology mapping plays out in Algonquian. The second proposal is that not every slot in the template corresponds to a distinct head in the syntax: in some instances, a single head is realized as more than one slot (that is, as a sequence of morphemes). This, too, is not a new idea: the Distributed Morphology framework includes a "fission" operation that allows a single syntactic terminal to be realized by more than one vocabulary item (Noyer 1992; see McGinnis 1995 for an Algonquian application). My goals here are (i) to show that fission, or some similar process, is responsible for much of the surface complexity of the Algonquian verb template; (ii) to demonstrate, using Algonquian as a case study, several criteria that can help to determine whether or not a particular templatic slot reflects a unique syntactic head; and (iii) to consider, in light of these proposals, the overall theoretical status of inflectional templates (cf. Good 2016).

The paper proceeds as follows. Section 2 proposes that the basic Algonquian verb inflection template (verb stem – theme sign – negative – central ending – mode – peripheral ending) directly reflects the syntactic structure of the clause (*v*P–Voice–Neg–T–Mod–C). Section 3 shows that a more complete template must recognize several additional slots (conjunct 3PL, outer obviative, impersonal, person prefix, central formative), but proposes that none of these slots corresponds to additional syntactic structure; instead, each slot realizes features that are fissioned from T. Section 4 introduces two further templatic slots (inner obviative, negative augment), which are argued to reflect fission of Voice and Neg. The complete template thus reflects no more syntactic structure than is needed to account for the basic template (*v*P–Voice–Neg–T–Mod–C). All additional templatic complexity lies at the morphological level, resulting from fission of the Voice, Neg, and T heads.

2 The basic template

Verb inflection in most Algonquian languages can be described as following the basic template in Figure 1. The verb stem is followed by three agreement slots, known as the THEME SIGN (Bloomfield 1946:98–102), CENTRAL ENDING (Goddard 1969:38), and PERIPHERAL ENDING (Goddard 1969:38). Some languages have a negative marker following the theme sign (Goddard 2006) and/or a TAM marker known as a MODE SIGN (Bloomfield 1946:100) following the central ending.[1]

	Verb stem	Theme sign	Neg sign	Central ending	Mode sign	Peripheral ending
ni- 1	*waapam* see.TA	*-ikw* -INV	*-ssiw* -NEG	*-inaa* -1PL	*-token* -DUB	*-ak* -3PL
	*v*P	Voice°	Neg°	T°	Mod°	C°

Figure 1: Basic Algonquian verb inflection template and analysis
(Ojibwe *niwaapamikossiinaatokenak* 'maybe they don't see us'; Nichols 1980:294)

Following much existing work, I assume that the slots in the basic template are mapped from the syntax as in (1). This mapping is fully consistent with typical conceptions of clausal structure.

(1)   a.   The verb stem realizes *v*P, including a verbalizing head *v* (Bruening 2001:122; Brittain 2003; Hirose 2003; Branigan, Brittain, and Dyck 2005, Piggott and Newell 2006; Mathieu 2007).

      b.   The theme sign realizes the agent-introducing head, which may be labelled as *v* or Voice (Hirose 2003; Bruening 2005; Béjar and Rezac 2009; Lochbihler 2012; Coon and Bale 2014; Hamilton 2015; Oxford 2017b; Tollan and Oxford 2018).

      c.   The negative sign realizes a polarity head that I will label as Neg.

      d.   The central ending realizes a functional head associated with phi-complete agreement and subjecthood, which may be labelled as Infl or T (Halle and Marantz 1993; Coon and Bale 2014; Hamilton 2015; Oxford 2017a, 2017b).

      e.   The mode sign realizes the Mod head, or perhaps one of a sequence of high TAM heads.

      f.   The peripheral ending realizes C (Halle and Marantz 1993; Branigan and MacKenzie 1999; Bliss 2013; Oxford 2017a).[2]

The analysis of the three agreement slots as Voice (theme sign), T (central ending), and C (peripheral ending) is equivalent to that proposed for Potawatomi by Halle and Marantz (1993), for whom the theme sign (their "Agr1") is adjoined to "Ind", located in the same position as Voice, the central ending ("Agr2") is adjoined to T, and the peripheral ending ("Agr3") is adjoined to C.

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[1] Morpheme glosses follow the Leipzig Glossing Rules, with these additions: 21PL = inclusive first-person plural; AN = animate; DUB = dubitative; INAN = inanimate; INDIC = indicative; INV = inverse; OBV = obviative; PRET = preterit; TA = transitive animate; X = impersonal actor; 3:1 = third person acts on first person.

[2] The peripheral ending slot can contain either a third-person agreement marker (e.g., Meskwaki *-a* '3SG', *-aki* '3PL') or, in certain "conjunct order" forms, a complementizer suffix (e.g., Meskwaki subjunctive *-e* 'if, when', iterative *-ini* 'whenever'; Bloomfield 1946:101). I retract an earlier proposal that the peripheral ending and the person prefix (an additional slot discussed in §3.4.1 below) are pronominal clitics (Oxford 2014a,b).

3 Additional slots as fission of T

The template in Figure 1 suffices to describe the inflectional structure of many Algonquian verb forms, but it is not the full story. This section introduces several additional templatic slots (§3.1) and argues that they reflect fission of the agreement features on T (§3.2), which plays out differently in the inflectional paradigms known as the "conjunct" (§3.3) and the "independent" (§3.4).

3.1 More slots

In most Algonquian languages, a verb can inflect in two distinct paradigms known as the INDEPEN-DENT and the CONJUNCT; the choice of paradigm is determined by clause type. The two paradigms mark mostly the same contrasts, but they do so using morphological forms that are partially or completely different. For example, the 1PL form of the Ojibwe verb *nipaa-* 'sleep' is ***ninipaamin*** in the independent (*ni-...-min* '1PL') and *nipaayaank* in the conjunct (*-yaank* '1PL') (Nichols 1980). The two paradigms share the basic template in Figure 1 above, but each paradigm embellishes the template in a different way. The independent adds a person prefix, an outer obviative marker, and a central ending formative element, shown in Figure 2. The conjunct adds an impersonal marker, an outer obviative marker, and a 3PL marker, shown in Figure 3. Not all languages share all of these embellishments, but many do; the expanded templates in Figures 2 and 3 can be reconstructed for Proto-Algonquian (Bloomfield 1946; Goddard 1979, 2007).

Person prefix	Verb stem	Theme sign	Neg sign	**Outer obv**	Central ending		Mode sign	Peripheral ending
					Formative	Pluralizer		
??	*v*P	Voice°	Neg°	**??**	**??**	T°	Mod°	C°

Figure 2: Expanded template for independent verb inflection

Verb stem	Theme sign	Neg sign	**Impers**	**Outer obv**	**3PL**	Central ending	**3PL**	Mode sign	Peripheral ending
*v*P	Voice°	Neg°	**??**	**??**	**??**	T°	**??**	Mod°	C°

Figure 3: Expanded template for conjunct verb inflection

How should a formal analysis accommodate the additional templatic slots? One option is to elaborate the syntactic structure by positing an additional head for each additional slot. This move would be reasonable if our null hypothesis were that all morphological structure is determined in the syntax. I suggest, however, that this should not be the null hypothesis, since work in Distributed Morphology has shown that some aspects of morphological structure reflect purely morphological processes such as fusion and fission (Halle and Marantz 1993; Noyer 1992). A morphological slot should be analyzed as reflecting a distinct syntactic head only when there is evidence that the content of that slot patterns as a distinct entity in the syntax. I will argue below that none of the additional slots in Figures 2 and 3 meet this criterion. Rather, the additional slots serve simply to *augment the realization of T* by spelling out features of the T head that are not realized by the central ending itself. Such augmentation is purely a matter of morphological form; it has no syntactic causes or

consequences and is thus most appropriately analyzed as arising at the morphological level, through an operation such as fission, rather than in the syntax.

3.2 Agreement features on T

Since the additional slots in Figures 2 and 3 serve to realize features of T, it is useful to review the patterning of agreement on T before we consider the additional slots. T-agreement is the only instance of *phi-complete* agreement in the Algonquian verb template: as illustrated in (2), T agrees for person, number, and animacy (*-naan* '1pl'),[3] whereas Voice agrees for person and animacy but not number (*-aa* '3.AN') and C agrees for number and animacy but not person (*-ik* 'AN.PL').

(2) niwaapamaanaanik

    ni- waapam -aa   **-naan** -ik

    1- see   -3.AN.OBJ **-1**PL   -AN.PL

    'we see them'   (Ojibwe; Nichols 1980:289)

In a transitive form, T agrees with the argument that ranks highest on a person hierarchy; this argument can be either the actor or the theme. The person hierarchy is construction-specific (Rhodes 1994). In the independent, the hierarchy is SAP > X > 3 > 3′ > 0 (Pentland 1999:235), where SAP is a speech-act participant (first or second person), X is the unspecified subject of an impersonal passive (e.g., 'people see me'), 3 is a topical PROXIMATE animate third person, 3′ is a non-topical OBVIATIVE animate third person, and 0 is an inanimate. In the conjunct, the hierarchy is 3 > 3′ > 0. When the hierarchy establishes no ranking between the arguments, as in, for example, a conjunct form in which a third person acts on a first person, T agrees with both arguments, enabling the realization of portmanteau T-agreement morphology when the relevant vocabulary item is available, such as *-ankit* '3:1PL' in the conjunct form in (3).

(3) waapamiyankitipan

    waapam -i   **-ankit** -ipan

    see   -1OBJ **-3:1**PL -PRET

    'she saw us'   (Ojibwe; Nichols 1980:326)

3.3 Fission of T in the conjunct

This section shows that each of the additional slots in the conjunct template in Figure 3 is best analyzed as augmenting the realization of T: the 3PL marker (§3.3.1), the outer obviative marker (§3.3.2), and the impersonal marker (§3.3.3) all realize features of an argument that T is predicted by the person hierarchy to agree with. These instances of fission of T are found in many Algonquian languages and can be reconstructed for Proto-Algonquian. Section 3.3.4 identifies additional instances of fission of T that have developed as innovations in Kickapoo and Ojibwe.

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[3] The sensitivity of T-agreement to animacy is indicated most clearly by the contrast between the conjunct T-agreement suffixes *-t* 'animate 3' and *-k* 'inanimate 3'.

3.3.1 3PL marker

The conjunct T-agreement marker for an animate third person is *-t* (Bloomfield 1946:101). (Here and throughout the paper, an asterisk indicates a Proto-Algonquian reconstruction.) When the third person that T agrees with is singular, *-t* occurs on its own, as in the Ojibwe form in (4a) (Nichols 1980:322). When the third person is plural, *-t* is augmented by another suffix, *-wa·(w)* '3PL', which sits adjacent to *-t* and indicates that the third person indexed by *-t* is plural, as in (4b).

(4) a. waapamikoppan
      waapam -ikw **-t** -pan
      see   -INV **-3** -PRET
      'the other saw **her**'

    b. waapamikowaappan
      waapam -ikw **-waa -t** -pan
      see   -INV **-3PL -3** -PRET
      'the other saw **them**'

I suggest that the third-person agreement morphology in these forms is derived as follows. In the syntax, the person hierarchy requires T to agree with the proximate argument, which is 'her' [3.AN.SG] in (4a) and 'them' [3.AN.PL] in (4b).[4] Later, in the morphological stage of the derivation, the T head is spelled out by a central ending drawn from the set in (5) (Nichols 1980:190):

(5)   *-(y)aan* '1SG', *-(y)an* '2SG', *-(y)aank* '1PL', *-(y)ankw* '21PL', *-(y)ekw* '2PL', *-t* '3.AN', *-k* '3.INAN'

Since the third-person central endings do not distinguish number, T is spelled out as *-t* '3.AN' in both (4a) and (4b). The spellout of *-t* discharges the [3] feature of T but leaves the marked [PL] feature in (4b) undischarged. In this context, fission makes available an additional position of exponence for the undischarged [PL] feature and the 3PL marker *-waa* is inserted in this position.[5] As a result of this derivation, the T head in (4b) is realized by two vocabulary items — or, in templatic terms, by two slots: the central ending *-t* and the 3PL marker *-waa*.

    The same effect can arise in contexts where T agrees with both arguments, such as the 3-on-1 forms in (6). In both forms, T agrees with both the third-person actor and the first-person theme, and the portmanteau central ending *-ankit* '3:1PL' discharges the [3] and [1PL] features of T. When the third person is singular, as in (6a), no further vocabulary insertion takes place. When the third person is plural, however, as in (6b), the remaining third-person [PL] feature — which was not discharged by *-ankit* — undergoes fission and is realized by the 3PL marker *-waa*.

(6) a. waapamiyankitipan
      waapam -i   **-ankit** -ipan
      see   -1OBJ **-3:1PL** -PRET
      'she saw us'

    b. waapamiyankitwaapan
      waapam -i   **-ankit -waa** -ipan
      see   -1OBJ **-3:1PL** -3PL   -PRET
      'they saw us'

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[4] I take no position here on the ultimate source of the person hierarchy, as this paper is concerned only with the exponence of the agreement features on T, not with the manner in which T gains these features.

[5] The vocabulary item for *-waa* is given in (i). The parentheses around "3" indicate that *-waa* discharges the feature [PL] only when the feature [3] has already been discharged (Noyer 1992). This formulation captures the fact that *-waa* can only appear alongside a third-person central suffix.

(i) *-waa* ⟷ PL (3)

A fission analysis of *-waa* is desirable for several reasons. First, by attributing both *-waa* and the adjacent third-person central ending (which is usually *-t* '3.AN' but can also be a portmanteau such as *-ankit* '3:1PL') to the same syntactic head (T), the fission analysis captures the fact that *-waa* only ever occurs alongside a central ending and always indexes the same argument that the central ending does (or one of the same arguments, in portmanteau cases). Goddard (1969:96) states that *-waa* serves "to pluralize the third person animate central ending /-t/". What does it mean to say that suffix Y pluralizes suffix X? Fission provides an appropriate formalization: both suffixes realize the same feature bundle, with suffix Y discharging a plural feature that suffix X left undischarged.

A second benefit of a fission analysis of *-waa* lies in the status of the 3PL slot in the template. Most agreement slots can host a range of exponents: the central ending slot, which is the primary realization of T, can host any of the exponents in (5) above; the facts are similar for the theme sign (Voice) and the peripheral ending (C). The 3PL slot, however, is unusual in that it is dedicated to a single exponent, the plural marker *-waa*. If the 3PL slot did in fact correspond to a distinct agreement head in the syntax, it would be strange that this agreement head only ever bore the same feature bundle [3PL]. Under a fission analysis, however, the fact that the 3PL slot exists to host a single exponent is not unusual at all, since the 3PL slot is created by fission for exactly that purpose — to express a single feature, [PL], that is left unexpressed by the third-person central ending.

A third benefit of a fission analysis involves the position of the 3PL marker in the template. Both within and across languages, there is variation in whether the 3PL marker precedes or follows the central ending. For example, in the Ojibwe 3-on-1 form in (7a), *-waa* precedes *-t*, but in the minimally different Ojibwe 3-on-2 form in (7b), *-waa* instead follows *-t* (Nichols 1980:326,329).

(7) a. waapamiwaappan

     waapam -i   **-waa -t** -pan
     see   -1OBJ **-3PL -3** -PRET
     '**they** saw me'

     b. waapamikkwaapan

     waapam -ih   **-t -waa** -pan
     see   -2OBJ **-3 -3PL** -PRET
     '**they** saw you'

In this pair of examples the motivation for the variation in the relative order of *-t* and *-waa* may be phonological: placing *-waa* after *-t* in (7b) avoids breaking up the consonant cluster *-kk-* (underlying /-h-t-/). In other cases, particulary where the same form shows opposite orders in different languages, the variation appears to be completely random. Under a fission analysis, this variation can be accounted for as a shallow fact of morphological realization: since *-waa* and *-t* are both inserted under the T node, their order may be reversed with no structural consequences. Since the variation in the position of *-waa* is not conditioned by syntactic or semantic factors, a shallow, surface-level morphological analysis such as this is preferable to a syntactic analysis in which the position of *-waa* is fixed by its status as a distinct head in the syntax.

A final benefit of the fission analysis involves morphological loss. In some languages, such as Meskwaki (Goddard 1994), 3PL *-wa·(w)* no longer appears in forms in which a first or second person acts on a third person. For example, where Ojibwe contrasts *waapamak* 'I see him/her' (without 3PL *-waa*) and *waapamakwaa* 'I see them' (with 3PL *-waa*), Meskwaki has only number-neutral *wa·pamaki* 'I see him/her/them'. Under a fission analysis of *-wa·(w)*, the change that took place in Meskwaki has no deep structural implications: it is simply the case that fission of T has ceased to occur in certain contexts. A shallow morphological analysis such as this seems appropriate, as there is no evidence that the loss of 3PL *-wa·(w)* in Meskwaki had any syntactic triggers or ramifications, and thus no basis for analyzing this change as a syntactic change.

In summary, a fission-style analysis in which the 3PL slot and the central ending slot both realize the same syntactic head (T) is preferable to an analysis in which the two slots realize distinct heads for several reasons, including the adjacency of the two slots, the fact that the 3PL marker always accompanies a third-person central ending, the systematic coreference of the 3PL marker and the third-person central ending, the fact that the 3PL slot is dedicated to a single exponent, and the fact that the 3PL slot is especially susceptible to positional variation and loss without any syntactic consequences. All of these properties follow more naturally under a fission analysis than they would under an analysis in which the 3PL marker and the central ending realize distinct syntactic heads.

3.3.2 Outer obviative marker

Just as the 3PL marker *-wa·(w)* expresses that a third person indexed by the central ending is plural, the outer obviative marker *-ri* expresses that a third person indexed by the central ending is obviative. Consider the Ojibwe forms in (8) (Nichols 1980:316). In (8), where the two third-person arguments are proximate and obviative, T agrees with the proximate argument and is realized as the third-person central ending *-t*. In (8), where the two third-person arguments are obviative and further obviative, T agrees with the obviative argument and is realized as the third-person central ending *-t* augmented by the obviative marker *-ni*.

(8)   a.   waapamaappan

          waapam -aa   **-t** -pan

          see   -3OBJ **-3** -PRET

          '**she (prox.)** saw the other (obv.)'

     b.   waapamaanippan

          waapam -aa   **-ni** **-t** -pan

          see   -3OBJ **-OBV** **-3** -PRET

          '**she (obv.)** saw the other (further obv.)'

The fission analysis of obviative *-ni* in (8) is parallel to that of 3PL *-wa·(w)*: when T agrees with an obviative third person, it gains the features [3, OBV]; the central ending *-t* discharges the feature [3] but leaves [OBV] undischarged; fission then takes place and [OBV] is discharged by *-ni*. This analysis is motivated by considerations parallel to those discussed for *-wa·(w)* above, but space limitations preclude a fuller discussion here.[6]

3.3.3 Impersonal marker

I use the term IMPERSONAL to refer to the inflectional forms known by Algonquianists as "unspecified actor", "indefinite actor", or "passive" (Dryer 1996; Hockett 1996), which have English translations such as 'we are seen' or 'people see us'. The unspecified actor in such forms is conventionally notated as "X" and will be translated as 'people.X' in the examples below.

In some morphologically conservative languages, the impersonal forms of the conjunct order are marked by an impersonal suffix *-en*, which precedes the central ending (Goddard 1979:88). Consider the Miami-Illinois impersonal forms in (9) (Costa 2003:310). In (9a), where X acts on 'us inclusive' (21PL), the central ending *-ankw* '21PL' is preceded by impersonal *-en* 'X'. In (9b), where X acts on a third person, the central ending *-t* '3' is preceded by impersonal *-en* 'X'.

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[6] An analysis in which *-ri* augments (or "obviates") a third-person central ending seems applicable across most of the Algonquian family, but certain Cree dialects have undergone changes in the distribution of *-ri* that may require a different analysis; see Kang (2017:§4.3) for discussion. See also Déchaine (1999:64–66) for discussion of the patterning of *-ri* in Cree.

(9) a. waapamelinankwi

    waapam -el   **-en -ankw** -i
    see   -2ᴏʙᴊ **-X -21**ᴘʟ -ɪɴᴅɪᴄ
    'people.X see us (inclusive)'

b. waapamenci

    waapam -Ø   **-en -t** -i
    see   -3ᴏʙᴊ **-X -3** -ɪɴᴅɪᴄ
    'people.X see her'

In earlier work (Oxford 2014a:156ff) I proposed that impersonal *-en* was realized in the same position as the inverse theme sign, which I now analyze as a realization of the Voice head (Oxford 2017b). The idea of a connection between impersonal *-en* and Voice seems reasonable based on the examples in (9), since *-en* expresses something like the passive voice and occurs immediately to the right of the realization of Voice (which, in these forms, is the theme sign *-el* '2ᴏʙᴊ', *-Ø* '3ᴏʙᴊ'). A Voice analysis of impersonal *-en* becomes less attractive, however, when we consider negative forms such as (10), which is the negative equivalent of (9b). Here the negative sign *-hsiw*, which I analyze as realizing the Neg head (§2), intervenes between Voice (*-aa* '3ᴏʙᴊ') and impersonal *-en*. If the Mirror Principle holds in Algonquian — and all indications are that it does — then the position of impersonal *-en* to the right of Neg indicates that impersonal *-en* originates higher than NegP in the syntax. A connection between *-en* and Voice is thus unlikely.

(10)   waapamaahsiionci

    waapam -aa   -hsiw **-en -t** -i
    see   -3ᴏʙᴊ -ɴᴇɢ **-X -3** -ɪɴᴅɪᴄ
    'people.X don't see her'   (Costa 2003:348)

What, then, is the syntactic origin of impersonal *-en*? Since it seems likely that *-en* originates higher than NegP, let us turn our attention to the T head. The conjunct person hierarchy predicts that in an X-on-3 form such as (10), T should agree with both X *and* 3, since the 3>3′>0 hierarchy establishes no ranking between X and 3 (§3.2). T thus gains the features [X] and [3.ᴀɴ], which ought to allow T to be realized as a portmanteau vocabulary item dedicated to the X-on-3 combination — but no such VI exists. Instead, T is realized as the next-most-specified VI: the familiar third-person central ending *-t*, which discharges the [3.ᴀɴ] features of T but leaves the [X] feature undischarged. Fission then takes place, allowing [X] to be spelled out by the additional exponent *-en* 'X'. This additional exponent appears immediately to the left of the central ending, just as 3ᴘʟ *-wa·(w)* and obviative *-ri* do. Impersonal *-en* thus has exactly the same status as *-wa·(w)* and *-ri*: it augments the realization of T by discharging a feature of T that was not discharged by the central ending itself. As with *-wa·(w)* and *-ri*, the fission analysis of *-en* is supported by evidence from distribution, variation, and irregularity, but space limitations preclude a fuller discussion.

3.3.4 More fission of T in the conjunct

Plural *-wa·(w)*, obviative *-ri*, and impersonal *-en* are the only instances of fission of conjunct T that are attested across the family and can be reconstructed for Proto-Algonquian, but it is of course possible that individual daughter languages may have developed new instances of fission. In Kickapoo, for example, the portmanteau central ending *-amet* '3:1ᴘʟ' (from Proto-Algonquian *-ament* '3:1ᴘʟ') has the innovative obviative counterpart *-ame**nit*** '3ᴏʙᴠ:1ᴘʟ' (Voorhis 1974:83), in which the obviative augment *-ni* (§3.3.2) splits the *-amet* suffix into two halves: *-ame*, which may be analyzed as an idiosyncratic first-person plural marker dedicated to 3:1ᴘʟ contexts, and *-t*, the familiar third-person central ending. Since there are no indications that this innovation coincides with

any larger-scale restructuring of Kickapoo morphology or syntax, it seems most appropriate to posit a shallow morphological analysis in which original *-amet* has been reanalyzed as two vocabulary items, *-ame* '1PL' and *-t* '3', which both discharge features of T (as does intervening *-ni* 'OBV').

A similar innovation has taken place in one Ojibwe dialect. In 1PL:3 forms, the original portmanteau central ending **-akent* '1PL:3' is retained as *-akint* in Old Algonquin (Daviault 1994:464), but most other Ojibwe dialects have transposed the nasal, giving *-ankit* (Nichols 1980:315) or, with voicing, *-angid* (Valentine 2001:295). Of interest to us is the Parry Island dialect, which has gone on to lengthen the first vowel to *-a·* by analogy with the non-portmanteau central ending *-a·ng* '1PL', giving *-a·ngid* '1PL:3' (Valentine 2001:295). This reshaped 1PL:3 ending no longer requires a portmanteau analysis, as it can be segmented as a sequence of two independently-attested central endings: *-a·ng* '1PL' + *-(i)d* '3'. The occurrence of this sequence in the T position has an obvious fission analysis: when T has the features [1PL, 3.AN], *-a·ng* discharges [1PL] and *-(i)d* discharges [3.AN]. Fission has been deployed here to "unpack" the two sets of features that were originally expressed simultaneously by the opaque portmanteau form *-angid* '1PL:3'.[7] Since this "unpacking" is limited to just this small corner of the conjunct paradigm, a fission analysis is more appropriate than a purely syntactic analysis, which would be forced to posit the addition of an extra head that serves no function other than hosting *-(i)d* in just this particular form.

3.4 Fission of T in the independent

The additional slots in the expanded independent template in Figure 2 above are the person prefix (§3.4.1), the central ending formative element (§3.4.2), and the outer obviative marker. As in the conjunct, these slots are best regarded as augments of the central ending (T). The outer obviative marker is in fact the same **-ri* suffix that occurs in the conjunct (§3.3.2 above); its patterning in the independent is generally the same as in the conjunct and it will not be discussed further here.

3.4.1 Person prefix

With one exception, discussed below, the person prefix always indexes the same argument that is indexed by the central ending (T). Consider the Ojibwe examples in (11) (Nichols 1980:289). In (11a), the prefix *ni-* '1' and the central ending *-naan* '1PL' both index 'we', while in (11b), the prefix *o-* '3' and the central ending *-waa* '3PL' both index 'they'.[8]

(11)　a.　niwaapamaanaanik　　　　　　　b.　owaapamaawaan

　　　　ni- waapam -aa　**-naan** -ik　　　　　**o-** waapam -aa　　**-waa** -an

　　　　1- see　　-3OBJ **-1PL**　-AN.PL　　　　**3-** see　　　-3OBJ **-3PL** -OBV

　　　　'**we** see them'　　　　　　　　　　　'**they** see the other'

Prefix-suffix combinations such as *ni-…-naan* '1PL' and *o-…-waa* '3PL' may be described as circumfixes, since it is impossible for the *-naan* and *-waa* suffixes to occur on their own without a prefix. The patterning of the prefix and central ending as a single unit is reinforced by the fact that

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[7] Presumably by analogy with its "unpacking" of the 1PL:3 form, the Parry Island dialect has also changed the central agreement in 21PL:3 forms from original *-ang(w)* '21PL', which left the third person unexpressed, to *-angid* (Valentine 2001:295), which can be analyzed as the sequence of *-ang(w)* '21PL' + *-(i)d* '3.AN'.

[8] The independent central ending *-waa* is a distinct morpheme from the conjunct 3PL marker *-waa* (§3.3.1).

the two slots also *disappear* together: whenever the central ending fails to appear in a form in which it could conceivably appear, the prefix fails to appear as well. In intransitive third-person forms, for example, the subject is indexed by a peripheral ending (-*ek* 'AN.PL' in (12)). In such cases, the central ending is exceptionally absent, even though the relevant morphology exists (-*waa* '3PL')—and the prefix is exceptionally absent as well. (These empty slots are indicated by dashes in (12).)

(12)   maacaapanek

    – maacaa – -pan   -ek
    – leave   – -PRET -AN.PL
    'they left'   (Ojibwe; Nichols 1980:277)

We can capture the consistent shared patterning of the prefix and the central ending if we take the prefix to realize the same agreement head that the central ending realizes — i.e., T. When T agrees with [1PL], for example, as in (11) above, the prefix discharges the [1] feature of T but not the [PL] feature; fission then takes place, creating an additional position of exponence for [PL], which is discharged by the central suffix -*naan*. The vocabulary item for -*naan* is given in (13). The parentheses around "1" indicate that -*naan* discharges the feature [PL] only when the feature [1] has already been discharged, as in Noyer's (1992:133) analysis of an identical pattern in Tamazight Berber. This formulation captures the fact that -*naan* must always co-occur with a first-person marker.

(13)   -*naan* ⟷ PL (1)

A fission analysis captures the shared patterning of the prefix and central ending, but it raises an important question: if the prefix and central ending realize the same head (T), why is the prefix positioned at the beginning of the verb word rather than immediately adjacent to the central ending? In lieu of a worked-out answer, I will simply point out that from a crosslinguistic perspective, discontinuous person prefix + number suffix combinations are exceedingly common (see the extensive surveys in Trommer 2002 and Campbell 2012). The derivation of person prefixes is thus not a problem for Algonquian agreement in particular, but rather a more general crosslinguistic problem for the analysis of agreement, and any solution that works for other languages with this pattern (such as the analysis proposed in Harbour 2008) will work for Algonquian as well.

At the beginning of this section, I mentioned that there is one exception to the generalization that the prefix and the central ending always index the same argument. The exception involves so-called "you-and-me forms" (Goddard 1967:67) such as (14), in which both arguments are speech-act participants. Here the prefix and central ending disagree: the prefix indexes the second-person actor (*ki-* '2') while the central ending indexes the first-person theme (-*min* '1PL').

(14)   kiwaapamimin

    ki- waapam -i   **-min**
    2-   see   -1OBJ   **-1**PL
    'you see us'   (Ojibwe; Nichols 1980:297)

You-and-me forms with this pattern are not a problem for the proposed analysis. Recall from above (§3.2) that the person hierarchy in the independent is SAP > X > 3 > 3′ > 0, and that T agrees with whichever argument ranks higher on this hierarchy — or with both arguments when the hierarchy

does not determine a ranking. Since first and second person are not ranked with respect to each other (Pentland 1999:235), you-and-me forms are the one context in the independent inflection where T will agree with both arguments, gaining two bundles of phi-features. If the prefix discharges a feature from one bundle and the central ending discharges a feature from the other bundle, the result is a form such as (14) in which the prefix and central ending index different arguments. Since non-coreferential prefix-suffix combinations such as *ki-…-min* '2, 1PL' are realizations of T that discharge features of two distinct arguments, they are, in a sense, the independent counterpart of the portmanteau central endings that exist in the conjunct (such as *-ankit* '1PL:3'), which may be described in the same way. The difference, of course, is that *-ankit* is a single vocabulary item, and thus is a true portmanteau, whereas *ki-…-min* is a composite of two vocabulary items.

3.4.2   Central ending formative element

Thus far I have described the independent central ending (e.g., *-min* '1PL' in (14) above) as a single morpheme, but there are reasons to think that such central endings may, in at least some cases, be internally complex. Proto-Algonquian in fact had three parallel sets of independent central endings, shown in Table 1, which are preserved at least partially in most languages. The endings are bipartite, consisting of a "formative element" (Goddard 2007) followed by a pluralizer. Each set of endings is characterized by a different formative element: the "m-endings" begin with *-*ehm*, the "w-endings" begin with *-*w*, and the "n-endings" begin with *-*en(e·)*. The same pluralizers are used across all three sets of endings: *-Ø '1,2,3SG', *-*ena·n* '1PL', *-*enaw* '21PL', *-*wa·w* '2,3PL'.

Table 1: Three sets of independent central endings in Proto-Algonquian (Goddard 1967, 2007)

m-endings (formative *-*ehm*-)		w-endings (formative *-*w*-)		n-endings (formative *-*en(e·)*)	
1,2SG	*-e	1,2,3SG	*-w	1,2,3SG	*-en
1PL	*-ehmena·	1PL	*-wena·n	1PL	*-ene·na·n
21PL	*-ehmena	21PL	*-wenaw	21PL	*-ene·naw
2PL	*-ehmwa·	2,3PL	*-wa·w	2,3PL	*-ene·wa·w

In the daughter languages, and even in Proto-Algonquian, it can be difficult to determine whether or not there is a synchronic morpheme boundary between the formative and the pluralizer; Pentland (1999) argues that there is, while Goddard (2007) argues that there is not. A fission analysis is well-suited to handle this ambiguity. Let us assume, for the sake of exposition, that the Proto-Algonquian 1PL m-ending *-*ehmena·* '1PL' is segmentable as formative *-*ehm* plus 1PL *-ena·(n)* but its Ojibwe reflex *-min* '1PL' is not. Under a fission analysis, the difference between the two languages is minimal. In both languages, the central ending realizes T. In Proto-Algonquian, T undergoes fission and is realized by two vocabulary items, *-*ehm* and *-*ena·(n)*, while in Ojibwe, T does not undergo fission and is realized by a single vocabulary item, *-min*. The languages thus differ only in that original *-*ehm-ena·(n)*, a realization of T that consists of two vocabulary items, has been reanalyzed as *-min*, a realization of T that consists of a single vocabulary item.

While this is not a complete anlaysis of the formation and patterning of the independent central endings — a task that must be left to future work — the benefit of a fission approach is clear: by analyzing the formative and the pluralizer in a central ending such as *-*ehm-ena·(n)* '1PL' as separate

vocabulary items that realize the same head, a fission analysis formalizes Goddard's (2007:264) insight that the central endings consist of two parts but nevertheless function as a single morpheme.

4   Additional slots as fission of Voice and Neg

All instances of fission discussed above involve T . It is likely that T undergoes fission so prolifically simply because agreement on T is phi-complete, unlike agreement on Voice or C (§3.2), which leaves T with more phi-features, and thus more potential triggers of fission, than any other head. The effects of fission on the verb template are not limited to T, however. In addition to the extra slots identified in Figures 2 and 3 above, which all augment the realization of T, there are two further slots that augment Voice and Neg. Space restrictions allow only a brief description of each.

The **inner obviative marker *-em**, which immediately precedes the theme sign (Voice), augments the realization of Voice in the same way that outer obviative *-ri augments the realization of T (§3.3.2): when Voice agrees with an object that has the features [3, AN, OBV], the theme sign *-aa discharges [3, AN] and the obviative marker *-em discharges [OBV]. Compare the Kickapoo forms in (15) (Voorhis 1974:67–68): in (15a), with a proximate object, Voice is realized as -aa '3OBJ', while in (15b), with an obviative object, Voice is realized as -aa '3OBJ' augmented by -em 'OBV'.

(15)   a.   nemiinaapena

ne- miin **-aa**   -pena
1- give **-3**OBJ -1PL
'we give to **him/her/them (prox.)**'

b.   nemiinemaapena

ne- miin **-em -aa**   -pena
1- give **-**OBV **-3**OBJ -1PL
'we give to **him/her/them (obv.)**'

The **negative augment *-hsi** immediately precedes the negative marker *-w (Neg) in some languages (Goddard 2006). Negative *-w may be more accurately characterized as a non-affirmative marker, since it also appears in interrogative and dubitative forms (Goddard 2006:200), but the combination of *-w and a preceding *-hsi (i.e., *-hsi-w) is unambiguously negative. If the Neg head has the features [−affirmative, +negative], we can understand *-hsi-w as a composite negative marker realized through fission of Neg, with *-w discharging [−affirm] and *-hsi discharging [+neg].

5   Conclusions

The full set of inflectional slots discussed in this paper is shown in Figure 4 along with the proposed analysis. Although the template contains twelve inflectional slots, I have proposed that these slots reflect only five syntactic heads (Voice, Neg, T, Mod, C), with the additional slots serving as "augments" that express features that were not discharged by the primary exponent of each head.

(T°)	vP	Voice°		Neg°		T°						Mod°	C°
Pers pfx	Verb stem	Inner obv	Theme sign	Neg aug't	Neg sign	Im- pers	Outer obv	3 PL	Central ending Formative	Pluralizer	3 PL	Mode sign	Periph ending

Figure 4: Algonquian verb inflection template with proposed analysis

This approach to the Algonquian template contributes to our overall understanding of the status of traditional morphological templates, which, as Good (2016) has pointed out, remain undertheorized. In the Algonquian case, the apparent complexity of the template gives way to simplicity

once we recognize that some groups of slots may reflect a single more abstract entity. Good (2016) refers to such groups of slots theory-neutrally as "superpositions". Under the proposed analysis of Algonquian, the superpositions are ultimately syntactic in nature. A template such as that in Figure 4 can be thought of as a condensed formal analysis, with the first line representing the syntactic terminals and the second line representing the morphological nodes that realize each terminal.

The Algonquian case study highlights several criteria that can help to determine whether or not a particular templatic slot corresponds to a separate syntactic head. A fission analysis rather than a syntactic analysis may be appropriate if (i) the content of the slot in question corresponds systematically with the content of another slot (e.g., person prefix and central ending); (ii) the slot is unique to a particular inflectional paradigm (e.g., conjunct impersonal marker); (iii) the slot exists to host just one exponent (e.g., obviative marker); (iv) the position of the slot can vary without syntactic or semantic consequences (e.g., 3PL marker); (v) the existence of a distinct syntactic head corresponding to the content of the slot is unlikely (e.g., 3PL marker); (vi) the slot is particularly susceptible to diachronic loss without structural ramifications (e.g., 3PL, obviative, and impersonal markers); and (vii) the existence of a synchronic morpheme boundary between the slot and an adjacent slot is unclear (e.g., formative and pluralizer). None of these properties constitutes definitive evidence for fission, but if several of these properties hold, a fission analysis should be considered.

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