Ojibwe Agreement in Lexical-Realizational Functional Grammar*

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1 Our project

- We are developing a theoretical framework that couples Lexical-Functional Grammar (LFG; Bresnan et al. 2016) with the realizational, morpheme-based approach to word-formation of Distributed Morphology (DM; Halle and Marantz 1993)
- The resulting framework, which we call Lexical-Realizational Functional Grammar ($\mathrm{L_RFG}$), is particularly well-suited to model Canadian Indigenous languages, which are characterized by *polysynthesis* and *nonconfigurationality*
- In this talk we will summarize the framework, and demonstrate it with an analysis of Ojibwe inflection
- The talk will proceed as follows:
  - Section 2 outlines the $\mathrm{L_RFG}$ framework, comparing and contrasting it to standard LFG and providing details on the exponence function
  - Section 3 provides a brief introduction to Ojibwe, and a background on relevant aspects of the language's morphosyntax
  - Section 4 provides a demonstration of our analysis, including the structures of a representative example sentence, as well as presentation and discussion of the templates used and specifications of the Vocabulary Items needed for animate agreement in Ojibwe and for the examples in the handout
  - Section 5 indicates some directions for future research
  - The first two appendices provide structures for additional example sentences, demonstrating most of the Ojibwe agreement morphology under discussion (A) and a revised Correspondence Architecture (B), as well as additional discussion of conjunct-order agreement (C)

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2 The framework

2.1 Comparison with standard LFG

- L_RFG is similar to standard LFG, with changes to the c-structure and its relationship with words/morphemes
- The terminal nodes of c-structures *are not words*, but instead are f-descriptions (sets of f-structure equations and constraints)
- The c-structure is mapped to a v(ocabulary)-structure, a linearized structure in which vocabulary items (VIs) *expone* (i.e., realize) the features in the terminal nodes, via a correspondence function, ν.
- Formally, v-structure is a list, each member of which a feature structure with four attributes: PHON(OLOGY), DEP(ENDENCE), CLISIS, and ALIGN(MENT)[1]
  - The value of PHON(OLOGY) is the morphophonological realization of the VI, represented as a list of phonological elements (e.g., bundles of distinctive features, or whatever phonological rules take as inputs)
  - The value of DEP(ENDENCE) is itself a feature structure
    - It contains the features CLISIS and ALIGN.
    - The feature CLISIS has values EN or PRO and is used to encode whether a clitic is an enclitic or a proclitic.
    - The feature ALIGN has values R(IGHT) or L(EFT) and captures whether the item is realized on the right (suffixal) of the host VI or to its left (prefixal)[2]
    - The CLISIS and ALIGN features thus allow us to encode directionality of clisis and affixation independently[3]
    - A VI can thus be represented abstractly as follows:

(1) $$\begin{bmatrix} \text{PHON} & \langle \ldots \rangle \\ \text{DEP} & \begin{bmatrix} \text{CLISIS} & \text{EN/PRO} \\ \text{ALIGN} & \text{R/L} \end{bmatrix} \end{bmatrix}$$

- The order of c-structure terminal nodes is preserved in the v-structure, except for possible local flipping of affixes/clitics, governed by the CLISIS and ALIGN features.

[1] This characterization of clisis and alignment is tentative; Tina Bögel (pc) has informed us that mismatches between syntactic structure and the actual positioning of affixes and clitics can be dealt with using prosodic rules, rather than stipulated in the v-structure as outlined below. We are in fact meeting her this Friday to discuss this point, so this section will likely undergo major changes after this week.

[2] We simplify the content of ALIGN here, but we anticipate needing to add more structure to its value, in order to handle certain kinds of affixation, such as the English de-adjectival verbalizer *-en*, which requires monosyllabicity and final obstruence. In other words, a more articulated ALIGN will have to include a way to refer to phonological properties of the base, such that we might have to add some kind of BASE feature to the DEP structure.

[3] The canonical case will have enclitics aligning to the right and proclitics aligning to the left (i.e., canonically, proclitics are prefixal and enclitics are suffixal), such that there is no mismatch in linear order between c-structure and v-structure. However, specifying the CLISIS and ALIGN features separately allows for mismatches between the direction of clisis and affixation. Thus, an expression may be a suffixal proclitic, being phonologically dependent on an element to its right (in the c-structure) but appearing as a suffix on its host, such as the Latin conjunction *que*; or it may be a prefixal enclitic, appearing as a prefix on a host to its left, such as Romance object clitics.

- We define the set of terminal nodes, T, where N is the set of c-structure nodes and $\mathcal{M}$ is the mother function on nodes:

  (2) $\{n_1 \in N \mid \neg\exists n_2 \in N.\mathcal{M}(n_2) = n_1\}$

  Note that in this paper there are no cases of flipping, so the order of terminal nodes in c-structure is strictly the same as the order of their ν-correspondents in v-structure, so we can make the simplifying assumption that:

  (3) $\forall n_1, n_2 \in T.n_1 < n_2 \leftrightarrow \nu(n_1) < \nu(n_2)$

- Vocabulary structure is a morphophonological structure that maps to phonological form.
  - In other words, v-structure precedes the phonological string in the Correspondence Architecture (see, e.g., Asudeh 2012, 53), resulting in the revised architecture in Appendix B.
  - We capture this by introducing a new phonological correspondence function, o, which maps from vocabulary items to phonological outputs; in other words, the output of o is the output of phonology, a set of strings that are based on the PHON and DEP features of VIs.
  - In other words, the morphology is responsible for the input to phonology, but phonology does whatever phonology does to create the output, which is not part of morphology per se.
  - Given the set of VIs, V, and a set of phonological strings, P:

    (4) $o : V \rightarrow P$

- The relationship between terminal nodes and VIs is many-to-one, using the mechanism of *Spanning* (Haugen and Siddiqi 2016; Merchant 2015; Ramchand 2008; Svenonius 2016); i.e. one VI may realize features of multiple terminal nodes
- The result is similar to the Lexical Sharing model of Wescoat (2002, 2005), but maintains the complex internal structures of words as part of syntax
- In this paper, only the strings themselves are relevant, so we make some simplifying assumptions:
  1. We represent the output of the exponence function, ν, simply as a string, not a full VI structure
  2. We show alignment informally using the standard notational convention of adding a dash to the left or right of the string
  3. We do not show the o-mapping, but instead let the phonological forms stand in for the VI strings (i.e., we conflate the two for simplicity/presentational purposes)

2.2 The exponence function ν

- The exponence function ν maps from a pair of arguments to a VI, the exponence of the arguments.

- The first argument is a list of pre-terminal categories, typically of length 1, which are taken in the linear order they appear in the tree.
- The second argument is itself a function, Φ, which maps an f-description to the set of f-structures that satisfy the description; i.e. $\Phi(d \in D) = \{f \in F \mid f \models d\}$, where D is the set of valid f-descriptions and F is the set of f-structures.[4]
- In sum, ν maps **from** a pair whose first argument is a list of c-structure pre-terminal categories and whose second argument is a set of f-structures **to** a structured expression as described above.

- **Conditions on exponence:**
  - Let V be the range of the exponence function ν, the set of VIs (structured expressions); then the following condition on exponence holds.[5]

(5) Given $\alpha \in A$ and $\beta \in B$, where $A, B \subseteq V$, and a function $[\![\ ]\!]_p$ that returns the conventionalized presuppositions of a given expression,
If $\bigcup_{a \in A} [\![a]\!]_p = \bigcup_{b \in B} [\![b]\!]_p$
Then $\textbf{MostInformative}(\alpha, \beta)$

  - The conventionalized presuppositions of an expression are the set of presuppositions lexically triggered by the expression (Keenan 1971; Beaver 2001; Beaver and Geurts 2014). Presuppositions are propositions. Propositions are sets of possible worlds. Therefore, $[\![\ ]\!]_p$ returns a set of sets of possible worlds.
  - The antecedent of the conditional in (5) therefore collects the conventionalized presuppositions of its arguments in two sets and tests whether the sets are equal.
  - **MostInformative**(α, β) returns whichever of α,β has the most specific f-structure in the set of f-structures returned by Φ applied to the unions of α/β's collected f-descriptions. Formally:

$$\textbf{MostInformative}(\alpha, \beta) = \begin{cases} \alpha \textbf{ if } \exists f \forall g. f \in \pi_2(\nu^{-1}(\alpha)) \land g \in \pi_2(\nu^{-1}(\beta)) \land g \sqsubset f \\ \beta \textbf{ if } \exists f \forall g. f \in \pi_2(\nu^{-1}(\beta)) \land g \in \pi_2(\nu^{-1}(\alpha)) \land g \sqsubset f \\ \perp \textbf{ otherwise} \end{cases}$$

  - Thus, the condition in (5) amounts to a combination of the elsewhere condition/subset principle and an economy constraint that enforces spanning when possible

3 Ojibwe: Background

3.1 Why look at Ojibwe?

- Ojibwe exhibits many of the features that we hope to be able to model:
  - Nonconfigurationality – word order is very free (i.e., determined by discourse and pragmatic, rather than syntactic, factors)[6]

[4]We thank Ron Kaplan (p.c.) for discussion of this point. Any remaining errors are our own.

[5]One difference between our proposal and the lexical sharing of Wescoat (2002, 2005, 2007) is the notion, which we'll call *Pac-Man Spanning*, that VIs can span any number of adjacent preterminal nodes, so long as the presuppositions of the exponed expressions are held constant.

[6]When we say that Ojibwe is "nonconfigurational", we do not intend to claim that word order is completely

- Polysynthesis – complex verb morphology with extensive head-marking
- A direct-inverse-based agreement system cross-referencing all core arguments
- Various morphological processes, including verbal reflexives, noun incorporation, applicatives, various kinds of (anti)passives, and more

3.2 Ojibwe primer: Prominence, animacy and obviation

- Ojibwe grammar has many features that are mostly shared with the other Algonquian languages, but fairly uncommon outside the family:
  - Typical **polysynthetic** morphysyntactic features, including nonconfigurationality, extensive head-marking, and various kinds of incorporation
  - Agreement morphology determined by a **prominence hierarchy**, which involves:
    - A system of grammatical gender based on **animacy**
    - A system of **obviation** distinguishing clause-mate third-person animate arguments
  - A **direct-inverse** system that indicates the relationship between thematic roles and the person hierarchy
  - Two separate inflectional paradigms: **independent order**, found in most matrix clauses, and **conjunct order**, found in subordinate clauses and certain matrix clause contexts
  - Separate (derivational) verb classes based on (i) transitivity and (ii) the animacy of the object (if transitive) or subject (if intransitive)
- Some of these properties warrant some further discussion
- **Animacy:**
  - Ojibwe grammatical gender is based on animacy (**animate** vs. **inanimate**)
  - All nouns referring to notionally/semantically animate entities are grammatically animate; however, notionally inanimate nouns may be of either gender
  - Animacy (of the subject or object) determines the verb final suffix (i.e., verb class, v) that is used, among other things
- **Obviation:**
  - Obviation distinguishes third-person animate clausemates: in any clause, one third-person animate argument is **proximate**, and the rest are **obviative**
  - The choice of which argument is proximate is mainly based on (poorly-understood) pragmatic/discourse factors
  - Obviation is marked on nouns and is distinguished in verb agreement
  - Obviative nouns are unspecified for number (except in isolated inflectional contexts), and can be interpreted as singular or plural

free. We are using the term in the LFG sense (Bresnan et al. 2016), meaning that word order and phrase structure are not used to distinguish grammatical functions like subject and object. Instead, word order is determined by a combination of factors, including obviation and information structure; see Dahlstrom (2017) for extensive discussion and references.

- **The prominence/person hierarchy:**
  - The distribution of agreement affixes, and the choice of direct or inverse morphology, is based on arguments' relative positions in a **prominence/person hierarchy**
  - This ranks arguments in terms of person, obviation and animacy
  - The hierarchy is as follows (adapted from Valentine 2001, 268; abbreviations largely follow common Algonquianist practice):[7]

    (6) *Prominence Hierarchy*

2	2nd person
1	1st person
3	3rd person animate proximate
3′	3rd person animate obviative
0	3rd person inanimate

    - It should be noted that, while the ranking of 2 above 1 determines the insertion of the person prefix (at least on the view of Rhodes 1994; Rhodes and Valentine 2015, adopted here; see discussion below), there are other areas of the grammar where 1 appears to be ranked above 2, for instance when determining the insertion of certain agreement morphemes, and others where they appear to be equally ranked (see Section 4.2 and Appendix A)

- **Direct/inverse marking:**
  - In transitive clauses, the relationship between the two arguments' relative ranking in the prominence hierarchy and their thematic roles is tracked by the **direct/inverse** morpheme, known as a Theme Sign (analyzed as Voice; e.g., Oxford 2014, 2019):
    - When the agent is the higher-ranked argument and the patient is lower, the verb is marked as **direct**[8]
    - When the patient is the higher-ranked argument and the agent is lower, the verb is marked as **inverse**
  - The theoretical status of inversion in Ojibwe is still under debate. One question involves the relationship between inversion and the grammatical functions of subject and object
  - For some, the agent is always the subject and the patient is always the object (e.g., Valentine 2001; Dahlstrom 2014; Oxford 2019)
    - **Direct:** subject is higher-ranked, object is lower-ranked
    - **Inverse:** subject is lower-ranked, object is higher-ranked
    - Thus, in the diagram below, the solid lines represent the correspondences in a direct form, and the dashed lines the correspondences in inverse

[7] Contra Valentine (2001), we do not include the "unspecified actor" form in the prominence hierarchy; instead, we analyze these forms as instances of a short passive. See Section 4.2.5 for discussion.

[8] Following common practice, we are using the term "agent" to refer to agent-like roles, including causes and many experiencers – i.e., the agent proto-role in the sense of Dowty (1991). Similarly, the term "patient" is used for the proto-role that includes patients, recipients, themes, and so on.

(7) **GFs-as-θ-roles analysis**

θ-role	Agent	Patient
Grammatical function	Subject	Object
Prominence ranking	Higher	Lower

- For others, the higher-ranked argument is always the subject and the lower-ranked argument is always the object (e.g., Rhodes 1994, 2010)
  - **Direct:** subject is agent, object is patient
  - **Inverse:** subject is patient, object is agent
  - Thus, in the diagram below, the solid lines represent the correspondences in a direct form, and the dashed lines the correspondences in inverse

(8) **GFs-as-prominence analysis**

θ-role	Agent	Patient
Grammatical function	Subject	Object
Prominence ranking	Higher	Lower

- We adopt the **GFs-as-prominence analysis**, where the grammatical functions are defined in terms of the prominence hierarchy[9]
  - This allows us to treat direct/inverse marking as determining the mapping between f-structural objects (grammatical functions) and s-structural objects (thematic argument roles)
  - It also means that the subject and object have consistent (word-internal) c-structural positions, as with the clausal structure in configurational languages; the alternative would be to have specific positions for the higher and lower arguments, which is more difficult to model
  - See Section 4.2 for a formalization of this analysis

3.3 Data under consideration

- The data and analysis in this talk is meant to be widely applicable across the different varieties that linguists consider to be part of the Ojibwe language, including both Nishnaabemwin (such as Odawa) and Anishinaabemowin dialects (such as Southwestern Ojibwe and Algonquin)

- The data are taken mainly from Nichols's (1980) grammar of Southwestern Ojibwe, corroborated with the paradigms in Jones (1977) (Algonquin) and Valentine (2001) (Nishnaabemwin).
  - We include vowels that are omitted in the syncopated (Nishnaabemwin) dialects, and word final /n/, which is often dropped; we are essentially presenting the underlying

[9] While it has been claimed that there is syntactic evidence for the GFs-as-θ-roles analysis (e.g., Dahlstrom 2014; Alsina and Vigo 2017; Oxford 2019), the evidence largely relies on judgements that vary between Algonquian languages, and even between dialects or individual speakers of Ojibwe, as pointed out by Rhodes (1994, 443). It is possible that languages differ as to which is the proper analysis, as is claimed by McGinnis (1999); Alsina and Vigo (2017).

  - forms of the morphemes and inflected verbs, though their pronunciation varies widely from one variety to the next.
  - In cases where the inflectional morphemes themselves differ between dialects, we have done our best to present the more conservative forms, consulting the analysis of Proto-Algonquian in Oxford (2014). We made notes on instances of variation in the notes in Section 4.

- The current analysis accounts for the full verbal agreement system, including agreement for subjects, primary and secondary objects (SUBJ, OBJ, and OBJ_θ, respectively), both animate and inanimate, in both the independent and conjunct orders.

- We provide the templates that are invoked in the analysis, VIs for the set of inflectional morphemes that appear with these verbs, and illustrate by providing c-, f-, and v-structures for some representative examples.

4 Analysis: Ojibwe inflection

4.1 Example structure

- The following are the c-, f-, and v-structures for a representative example, which was constructed based on the paradigms in Valentine (2001) (more can be found in Appendix A)

- Note that, while we have included templates in the c-structure of the tree, as usual in LFG they are to be interpreted as the full bundle of features abbreviated by the template

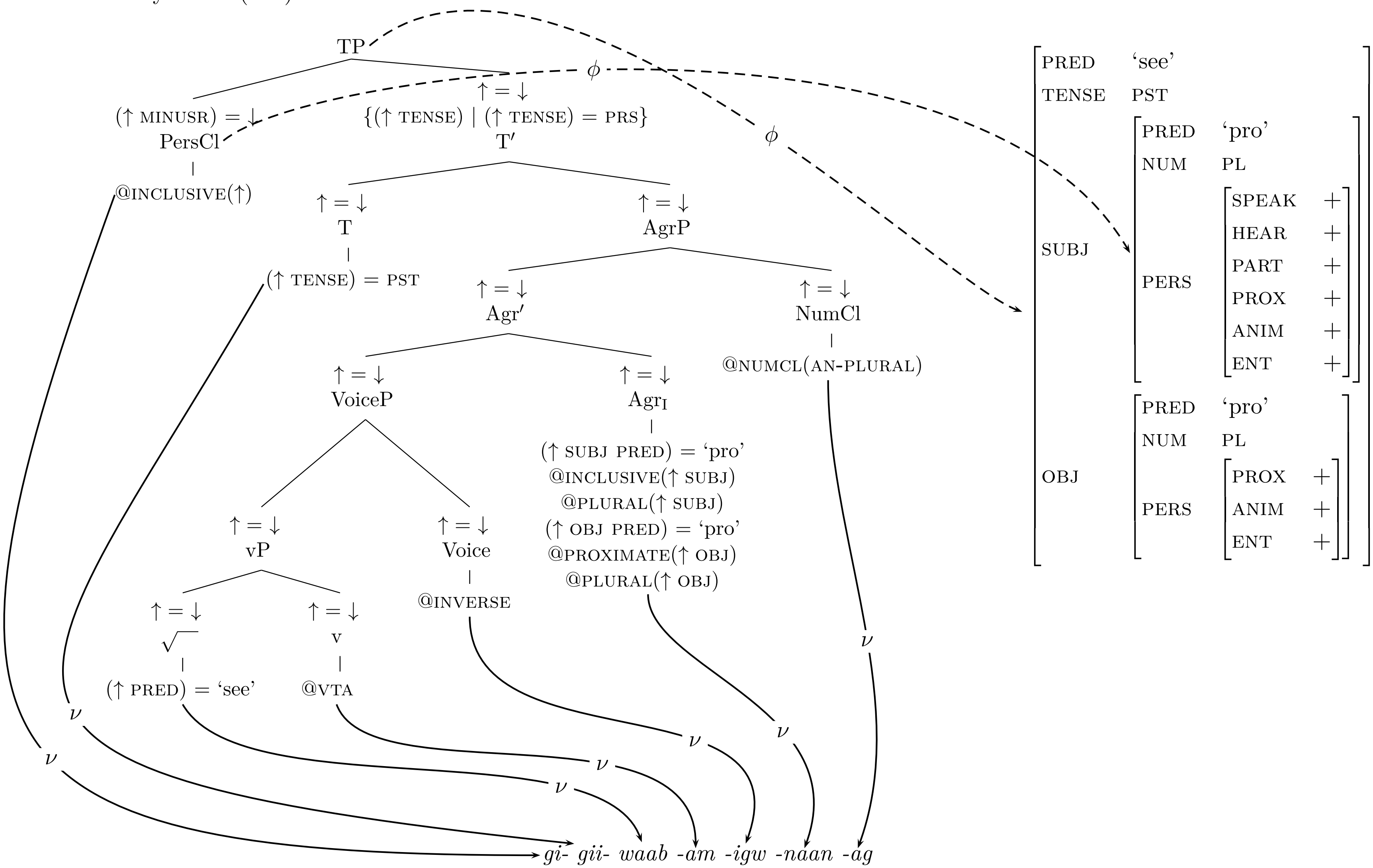
- Thus, the c-structure in (11) gives the expanded form of (10)

- Thus, while the description for the PersCl node in (10) is written in the c-structure as (9a), it should be read as in (9b):

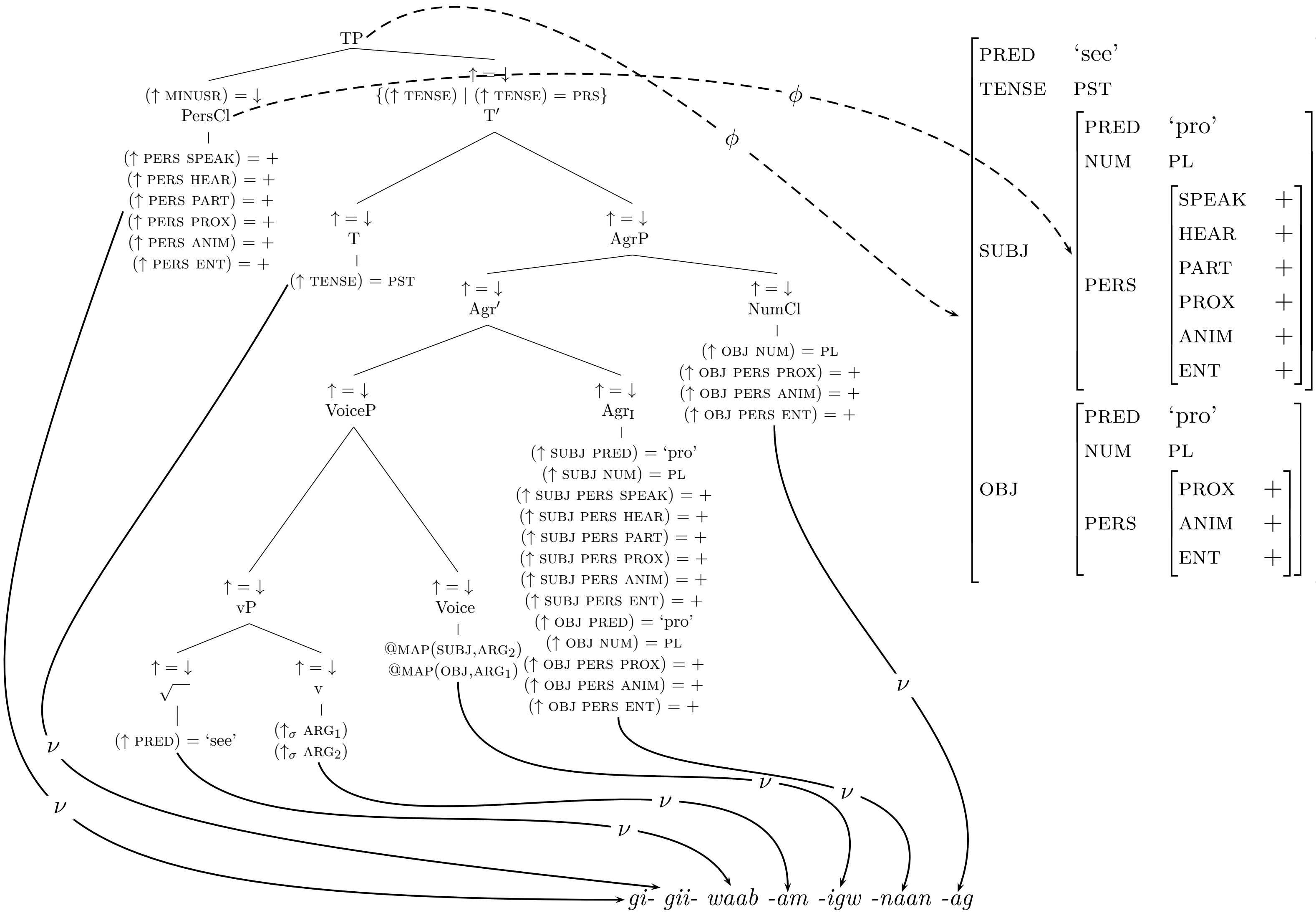
(9) a. @PLURAL(↑)
@INCLUSIVE(↑)

b. (↑ NUM) = PL
(↑ PERS SPEAK) = +
(↑ PERS HEAR) = +
(↑ PERS PART) = +
(↑ PERS PROX) = +
(↑ PERS ANIM) = +
(↑ PERS ENT) = +

(10) gi- gii- waab -am -igw -naan -ag
2 PST see VTA INV 1PL 3PL
'They saw us(incl).'



(11) gi- gii- waab -am -igw -naan -ag
2 PST see VTA INV 1PL 3PL
'They saw us(incl).'



4.2 Templates

- We make use of the LFG mechanism of *templates* (Dalrymple et al. 2004; Asudeh et al. 2013) to encode bundles of grammatical descriptions that get expressed in the language
- The templates involved in our analysis can be divided into five groups: those encoding general constraints, those encoding the prominence hierarchy (person/gender), those encoding obviation and number, those encoding verb classes, and those encoding the mapping between grammatical function and argument structure (direction, argument suppression).

4.2.1 Constraints

- Here we provide templates for constraints that determine the distribution of animacy, person, and alignment across grammatical functions and contexts
- The first two constraints hold in all contexts.
  - The first constraint, which we call the **Transitive Subject Constraint**, ensures that the subject of a clause with an object (either OBJ or OBJ_θ, i.e. PLUSO) must be animate; inanimate subjects are possible only in inanimate clauses (Rhodes 1990, 2010; Valentine 2001):

    (12) *Transitive Subject Constraint*
    $@\textsc{tsc} := [(\uparrow \textsc{subj})\ \&\ (\uparrow \textsc{pluso})] \Rightarrow [(\uparrow \textsc{subj anim}) = +]$

    - This ensures that transitives with an inanimate $\textsc{arg}_1$ are inverse, regardless of context (independent or conjunct).[10]
    - Correctly ensures that verbs with a secondary object ($\textsc{obj}_\theta$) must have an animate subject (in Algonquianist terms, correctly predicts that there are AI+O verbs, but no II+O verbs)
  - The second constraint, which we call the **Participant Argument Constraint**, ensures that 1st and 2nd person (i.e., participant) pronominals are possible only as subjects and (direct/primary) objects; secondary objects and obliques must be 3rd person (Rhodes 1990, 2010; Valentine 2001):

    (13) *Participant Argument Constraint*
    $@\textsc{pac} := \neg(\uparrow \textsc{plusr pers part})$

- We assume these two constraints are called by the c-structure rule introducing the root node CP, grouped together in the following template:

(14) $@\textsc{root} := @\textsc{tsc}$
$\qquad\qquad\qquad @\textsc{pac}$

- The last constraints, the **Prominence Constraints**, capture the different distributions of direct and inverse Voice heads in the independent and conjunct orders:

(15) *Independent Prominence Constraint*
$@\textsc{ipc} := [(\uparrow \textsc{subj})\ \&\ (\uparrow \textsc{obj})] \Rightarrow$
$\{[(\uparrow \textsc{subj pers part}) = +\ \&\ (\uparrow \textsc{obj pers part}) = +]\ |\ [(\uparrow \textsc{obj pers}) \sqsubset (\uparrow \textsc{subj pers})]\}$

[10] This is already ruled out in independent contexts by (15), but not conjunct contexts with a participant $\textsc{arg}_2$.

(16) *Conjunct Prominence Constraint*

$$@\textsc{ipc} \;:=\; [(\uparrow \textsc{subj})\ \&\ (\uparrow \textsc{obj})] \Rightarrow \{[(\uparrow \{\textsc{subj}|\textsc{obj}\}\ \textsc{pers part}) = + \mid [(\uparrow \textsc{obj pers}) \sqsubset (\uparrow \textsc{subj pers})]\}$$

- In independent forms, the subject always outranks the object (i.e., the object's PERS features properly subsume those of the subject) unless both the subject and object are participants
- In conjunct forms, the subject always outranks the object unless either the subject or object is a participant
- I assume that these constraints are specified by the different versions of Agr(P) found in the independent and conjunct orders
- The contrast between independent and conjunct order can be captured in templates, defined tentatively below in (19)

4.2.2 Prominence templates

- Following Bejar and Rezac (2009); Oxford (2014), among others, we assume that the person and animacy features are decomposed into a number of privative features
- Instead of the feature geometries used by the above authors, in our system the implicational relationships between the features are encoded in a set of templates, providing a way to represent the prominence hierarchy without stipulating independent structures beyond those already provided by the LFG framework

(17) *Prominence hierarchy templates*

Template	*Description*	*Explanation*
INCLUSIVE(f)	(f PERS SPEAK) = + (f PERS HEAR) = + @PARTICIPANT(f)	1st person inclusive
SPEAKER(f)	(f PERS SPEAK) = + @PARTICIPANT(f)	1st person
HEARER(f)	(f PERS HEAR) = + @PARTICIPANT(f)	2nd person
PARTICIPANT(f)	(f PERS PART) = + @PROXIMATE(f)	1 and/or 2
PROXIMATE(f)	(f PERS PROX) = + @ANIMATE(f)	3 and above
ANIMATE(f)	(f PERS ANIM) = + @ENTITY(f)	$3'$ and above
ENTITY(f)	(f PERS ENTITY) = +	All persons (0 and above)

- **Notes:**
  - Contra Valentine (2001), we exclude unspecified actors from the prominence hierarchy, following the analysis of Rhodes (1990), Rhodes and Valentine (2015) in which the "unspecified actor" forms are analyzed as a kind of short passive.

- This is because unspecified actors aren't treated syntactically as a grammatical function; VTA forms with an unspecified actor are inflected as intransitives.
- The "theme signs" indicating an unspecified actor are treated as passive Voice heads suppressing certain arguments, similar to the reflexive (but with a different kind of suppression – see below).
- This means that (in independent order forms) there are two homophonous Voice heads *-aa*, one indicating @DIRECT with a 3rd-person animate object, and one indicating an unspecified actor with a 3rd-person animate subject (however, the unspecified actor morpheme is different in conjunct forms).

4.2.3 Number and obviation templates

- We use the following templates to encode singular and plural number, and combinations of number, animacy, and obviation that are encoded in the verbal agreement system.

(18) *Number and obviation templates*

Template	*Description*	*Explanation*
PLURAL(f)	(f NUM) = PL	
SINGULAR(f)	(f NUM) = SG	
INAN-PLURAL(f)	@PLURAL(f) ¬(f PERS ANIM)	Inanimate plurals
AN-PLURAL(f)	@PLURAL(f) @ANIMATE(f) ¬(f PERS PART)	Animate 3rd person plurals
OBVIATIVE(f)	(f OBV) = + @ANIMATE(f) {@SINGULAR(f) | @PLURAL(f)}	Animate obviatives Number is ambiguous

- **Notes:**
  - While the @OBVIATIVE template encodes obviation with animate arguments, which is the canonical form of obviation, it is also possible for obviation to occur with inanimate arguments.
    - Unlike with animates, obviation is not marked on the DP in inanimate obviation; it is marked only in VII verb agreement.
    - Also unlike with animate, obviative inanimate arguments are not treated as number-neutral in either verbal or nominal morphology.
    - We mark these simply as being inanimate (with the @ENTITY template), with the obviation feature (↑ OBV) = +, which is not a PERS feature and which goes unrealized except in VII Agr heads, shown below.
  - The template @AN-PLURAL is used only for 3rd person animate plurals (not for participants), capturing the distribution of the *-ag* morpheme (found both with independent verbs and as a nominal plural marker).

4.2.4 Verb class and order templates

- Traditionally, Algonquianists group verbs into four classes, depending on transitivity and the animacy of one argument: VAI (intransitive, animate subject), VII (intransitive, inanimate subject), VTA (transitive, animate object), and VTI (transitive, inanimate object).
- However, Piggott (1979, 1989) argues that VAI and VTI verb finals (i.e., v heads) should be conflated, and we follow him here, leaving us with three verb class templates.
- The templates for verbal order (independent vs. conjunct) given here are very tentative, subject to revision to capture the subtleties of the distribution of the two orders.

(19) *Verb class and order templates*

Template	*Description*	*Explanation*
VTA	$(\uparrow_\sigma \textsc{arg}_1)$ $(\uparrow_\sigma \textsc{arg}_2)$	Two semantic arguments
VTI-VAI	$(\uparrow_\sigma \textsc{arg}_1)$ @ANIMATE($\uparrow$ SUBJ) $\neg(\uparrow$ OBJ PERS ANIM)	At least one semantic argument Subject is animate No animate object
VII	$(\uparrow_\sigma \textsc{arg}_1)$ $\neg(\uparrow$ SUBJ PERS ANIM)	At least one semantic argument Subject is inanimate
INDEP-ORDER(f)	@IPC $\neg$(GF f)	Indep. Prominence Constraint Cannot be embedded
CONJ-ORDER(f)	@CPC (GF f)	Conj. Prominence Constraint Must be embedded

- **Notes:**
  - We have removed the specification of $\{(\uparrow$ OBJ ANIM$) = + \mid \neg(\uparrow$ OBJ$)\}$ from the specification of @VTA, since inverse forms with inanimate objects (i.e., verbs with inanimate $\textsc{arg}_1$) use the @VTA verb class.
  - Inverse is ruled out for @VTI-VAI forms by the fact that neither this template nor the inverse Voice head introduces an $\textsc{arg}_2$. In contrast, the VTI direct Voice head does introduce $\textsc{arg}_2$.
  - It may be that the @ANIMATE($\uparrow$ SUBJ) specification for @VTI-VAI is redundant, in which case it can be removed
  - While VTI and VAI share a template for verb classification, they are distinguished by the presence of a direct theme sign (Voice head) in VTI contexts
  - The templates given for verbal order capture the generalization that the independent form is found in (most) root clauses, while the conjunct form is found elsewhere.[11]

4.2.5 Argument structure templates

- The following templates determine the mapping between grammatical functions (in the f-structure) and argument roles (in the s-structure):

[11] The actual situation is somewhat more complicated; the conjunct form is also found in main clauses in *wh*-questions, as well as in certain discourse contexts. The templates in (19) should be modified accordingly to account for this; however, distribution of the templates in c-structure rules and VIs should not be affected by this.

(20) *Templates for argument mapping*

Template	*Description*	*Explanation*
DIRECT	@MAP(SUBJ,ARG_1) @MAP(OBJ,ARG_2)	Subject ↦ agent Object ↦ patient
INVERSE	@MAP(SUBJ,ARG_2) @MAP(OBJ,ARG_1)	Subject ↦ patient Object ↦ agent
REFLEXIVE	@SUPPRESS(ARG_2,BIND(ARG_1))	Intransitive, binding relationship
SHORT-PASSIVE	@SUPPRESS(ARG_1,CLOSE-OFF)	Intransitive, agent existentially bound

- **Notes:**
  - We adopt certain templates from the account of lexical mapping in Findlay (2016, 2020):
    - @MAP(x,y) indicates that grammatical function x maps to argument role y
    - @SUPPRESS(x,y) indicates that argument role x receives no mapping; y is a template indicating how role x is interpreted
    - @BIND(z) indicates that argument role z is reflexively bound (by role x indicated in the @SUPPRESS template); Findlay (2020) encodes this reflexive binding in a meaning constructor associated with the @BIND template
    - @CLOSE-OFF indicates that argument role x (indicated in the @SUPPRESS template) is existentially bound
  - Thus, @REFLEXIVE indicates that the ARG_2 role is not associated with a grammatical function, but is coreferential with ARG_1
  - @SHORT-PASSIVE, using the template definition from Findlay (2020), indicates that the ARG_1 role is not associated with a grammatical function, but is existentially bound
    - The construction we are analyzing as a short passive is referred to in the Algonquianist tradition as the "unspecified actor" form (Valentine 2001); however, we follow Rhodes and Valentine (2015) in analyzing it as a passive.[12]
    - Unlike many languages, Ojibwe has only the short passive (where the agent role is unexpressed); there is no long passive in the language (where the subject is "demoted" to an oblique; Rhodes and Valentine 2015)

4.3 Vocabulary Items

- Here we list the VIs involved in Ojibwe agreement inflection.

4.3.1 Voice heads

- With the exception of the reflexive morpheme (which is traditionally called a verb final), these are traditionally referred to as "theme signs".

- The main voice heads involved in the agreement system are given below:

[12] Specifically, it corresponds to the "passive I" construction of Rhodes and Valentine (2015); while we do not provide an analysis of the "passive II" construction here, it seems amenable to the same kind of analysis.

(21) *Voice heads*

a. Direct Voice heads

$$\langle\ [\text{Voice}],\quad \Phi\left\{\begin{array}{l}@\textsc{direct}\\ @\textsc{addressee}(\uparrow \textsc{obj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-in}$$

$$\langle\ [\text{Voice}],\quad \Phi\left\{\begin{array}{l}@\textsc{direct}\\ @\textsc{participant}(\uparrow \textsc{obj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-i}$$

$$\langle\ [\text{Voice}],\quad \Phi\left\{\begin{array}{l}@\textsc{direct}\\ \neg(\uparrow \textsc{obj pers anim})\\ (\uparrow_\sigma \textsc{arg}_2)\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-am, -oo, -i}$$

b. Passive Voice heads

$$\langle\ [\text{Voice}],\quad \Phi\left\{\begin{array}{l}@\textsc{short-passive}\\ @\textsc{participant}(\uparrow \textsc{subj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-igoo}$$

$$\langle\ [\text{Voice}],\quad \Phi\left\{\begin{array}{l}@\textsc{short-passive}\\ @\textsc{animate}(\uparrow \textsc{subj})\\ @\textsc{conj-order}(\uparrow\ )\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-in}$$

c. Other Voice heads

$$\langle\ [\text{Voice}],\quad \Phi\left\{\ @\textsc{animate}((\uparrow_\sigma \textsc{arg}_2)_{\sigma^{-1}})\ \right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-aa}$$

$$\langle\ [\text{Voice}],\quad \Phi\left\{\ @\textsc{inverse}\ \right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-igw}$$

$$\langle\ [\text{Voice}],\quad \Phi\left\{\ @\textsc{reflexive}\ \right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-idizo}$$

- **Notes:**
  - The direction markers are unchanged from before, except the requirement of the inverse marker for an animate object has been removed, since these appear in inverse contexts with an inanimate object; furthermore, the VTI theme sign (realized as *-am, -oo,* or *-i*) has been added.
  - As mentioned in Section 4.2.4, the v heads with the @VTI-VAI template do not introduce $\textsc{arg}_2$; in this context, it is introduced by the VTI direct Voice head, which is realized in various contexts as *-am, -oo,* or *-i* (morphological allomorphy conditioned by the choice of v head present).
  - The form *-aa* is underspecified, showing up as a direct form when the object is 3rd-person animate, and a passive form when the subject is 3rd-person animate (though in the conjunct order, the *-in* suffix in (21c) plays this role). These two roles have in common that the grammatical function that maps to $\textsc{arg}_2$ is animate (object in direct voice contexts, subject in the passive).

4.3.2 Agr heads

- This is the category traditionally referred to as "central agreement suffixes".

- They are divided into two sets: one found in independent-order contexts (24), and one found in conjunct-order contexts (25).
  - We analyze these as two separate syntactic categories, called by c-structure rules to head the AgrP projection.
  - Specifically, they are called by an Agr′ rule defined as follows:

(22) $$\text{Agr}' \quad \rightarrow \quad \text{VoiceP} \quad \left\{ \begin{array}{c} \text{Agr}_{\text{I}} \\ @\textsc{indep-order}(\uparrow) \end{array} \middle| \begin{array}{c} \text{Agr}_{\text{C}} \\ @\textsc{conj-order}(\uparrow) \end{array} \right\}$$

- Many of the independent Agr forms have separate allomorphs that arise when (a) there is a PLUSO element present, but (b) there is no animate OBJ present.
  - In other words, it surfaces in transitives with an inanimate object, or in non-ditransitive contexts with a OBJ_{θ} .
  - This phenomenon is known as *n-registration* (Rhodes 1990), since the relevant morphemes contain /n/ and it registers a certain argument structure configuration.
  - The distribution of the n-registration Agr VIs can be characterized by the following template encoding the relevant constraints:

(23) $$@\text{NREG} \quad := \quad \begin{array}{l} (\uparrow \text{PLUSO}) \\ \neg(\uparrow \text{OBJ PERS ANIM}) \end{array}$$

  - For clarity, the VIs for Agr_{I} are divided into two groups: those without @NREG in (24a) and those with @NREG in (24b).

(24) *Independent Agr forms*

a. Non-@NREG forms

$$\langle\ [\mathrm{Agr_I}],\quad \Phi\left\{\begin{array}{l}(\uparrow \textsc{minusr}) = \%\textsc{gf}\\ @\textsc{speaker}(\%\textsc{gf})\\ @\textsc{plural}(\%\textsc{gf})\\ \{(\uparrow \textsc{obj pers part}) \mid \neg(\uparrow \textsc{obj})\}\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-min}$$

$$\langle\ [\mathrm{Agr_I}],\quad \Phi\left\{\begin{array}{l}(\uparrow \textsc{minusr}) = \%\textsc{gf}\\ @\textsc{participant}(\%\textsc{gf})\\ @\textsc{plural}(\%\textsc{gf})\\ \{(\uparrow \textsc{obj pers part}) \mid \neg(\uparrow \textsc{obj})\}\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-m}$$

$$\langle\ [\mathrm{Agr_I}],\quad \Phi\left\{\begin{array}{l}\neg(\uparrow \textsc{subj pers part})\\ \neg(\uparrow \textsc{pluso})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-w}$$

$$\langle\ [\mathrm{Agr_I}],\quad \Phi\left\{\begin{array}{l}@\textsc{speaker}(\uparrow \textsc{subj})\\ @\textsc{plural}(\uparrow \textsc{subj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-naa}$$

$$\langle\ [\mathrm{Agr_I}],\quad \Phi\left\{\begin{array}{l}@\textsc{proximate}(\uparrow \textsc{subj})\\ @\textsc{plural}(\uparrow \textsc{subj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-waa}$$

$$\langle\ [\mathrm{Agr_I}],\quad \Phi\left\{\begin{array}{l}(\uparrow \textsc{subj obv}) = +\\ \{\neg(\uparrow \textsc{subj pers anim}) \mid\\ (\uparrow \textsc{obj})\\ \neg(\uparrow \textsc{obj pers prox})\}\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-ini}$$

$$\langle\ [\mathrm{Agr_I}],\quad \Phi\left\{\ @\textsc{short-passive}\ \right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-m}$$

b. @NREG forms

$$\langle\ [\mathrm{Agr_I}],\quad \Phi\left\{\begin{array}{l}@\textsc{proximate}(\uparrow \textsc{subj})\\ @\textsc{plural}(\uparrow \textsc{subj})\\ @\textsc{nreg}\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-naawaa}$$

$$\langle\ [\mathrm{Agr_I}],\quad \Phi\left\{\begin{array}{l}@\textsc{animate}(\uparrow \textsc{obj}_\theta)\\ @\textsc{singular}(\uparrow \textsc{obj}_\theta)\\ @\textsc{nreg}\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-nan}$$

$$\langle\ [\mathrm{Agr_I}],\quad \Phi\left\{\ @\textsc{nreg}\ \right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-n}$$

- **Notes:**
  - The distribution of the morpheme *-min* differs across dialects. In certain dialects, including some of the Nishnaabemwin dialects characterized by Valentine (2001) and the Southwestern Ojibwe dialect recorded in Nichols (1980), it is found in any form that does not have an animate OBJ; see Goddard (2007) for a diachronic analysis of these morphemes.
  - The suffix *-w* signals a 3rd-person animate argument in intransitive forms (formerly analyzed as part of the *-wag* and *-wan* suffixes); in many cases it is absent due to phonological

rules that delete glides word-finally and in certain consonant-adjacent contexts.

  - The morpheme *-naawaa* is an allomorph of *-waa* that shows up only in @NREG contexts; the other transitive plural suffix *-naa* does not have a separate @NREG form.
  - The morphemes *-nan* and *-n* are @NREG morphemes that do not have separate non-@NREG counterparts: *-nan* appears when there is an animate singular OBJ_θ, and *-n* is an elsewhere form.
  - *-ini* indexes obviation in the subject when either the subject is inanimate, or the subject is animate and the object is also obviative.
  - The second suffix *-m* is the unspecified-actor form found with intransitive predicates.

- The conjunct Agr forms can be sorted into four groups: those that realize just the subject (25a); those that realize just one MINUSR function, but unspecified for which (25b);[13] those that realize both arguments (25c); and the passive form, which realizes neither argument (25d).[14]

(25) *Conjunct Agr forms*

a. Marking just subject

$$\langle\ [\text{Agr}_\text{C}],\quad \Phi\left\{\begin{array}{l}@\textsc{speaker}(\uparrow \textsc{subj})\\ @\textsc{singular}(\uparrow \textsc{subj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-aan}$$

$$\langle\ [\text{Agr}_\text{C}],\quad \Phi\left\{\begin{array}{l}@\textsc{participant}(\uparrow \textsc{subj})\\ @\textsc{singular}(\uparrow \textsc{subj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-an}$$

$$\langle\ [\text{Agr}_\text{C}],\quad \Phi\left\{\begin{array}{l}@\textsc{proximate}(\uparrow \textsc{subj})\\ @\textsc{singular}(\uparrow \textsc{subj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-d}$$

$$\langle\ [\text{Agr}_\text{C}],\quad \Phi\left\{\begin{array}{l}@\textsc{proximate}(\uparrow \textsc{subj})\\ @\textsc{plural}(\uparrow \textsc{subj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-waad}$$

$$\langle\ [\text{Agr}_\text{C}],\quad \Phi\left\{\ @\textsc{obviative}(\uparrow \textsc{subj})\ \right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-nid}$$

$$\langle\ [\text{Agr}_\text{C}],\quad \Phi\left\{\ @\textsc{entity}(\uparrow \textsc{subj})\ \right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-g}$$

$$\langle\ [\text{Agr}_\text{C}],\quad \Phi\left\{\begin{array}{l}@\textsc{obviative}(\uparrow \textsc{subj})\\ (\uparrow \textsc{subj obv}) = +\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-nig}$$

[13]Note that, while they realize features of only one argument, the forms in (25a) and (25b) can appear in transitive forms, as long as there is no compatible form in (25c) realizing features of both.

[14]Here we omit an additional morpheme that appears in most instances where there is a 3rd-person plural argument, *-waa*; see Appendix C for discussion of this morpheme.

b. Marking one MINUSR

$$\langle\ [\mathrm{Agr_C}],\quad \Phi\left\{\begin{array}{l}(\uparrow \textsc{minusr}) = \%\textsc{gf}\\ @\textsc{speaker}(\%\textsc{gf})\\ @\textsc{plural}(\%\textsc{gf})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-aang}$$

$$\langle\ [\mathrm{Agr_C}],\quad \Phi\left\{\begin{array}{l}(\uparrow \textsc{minusr}) = \%\textsc{gf}\\ @\textsc{inclusive}(\%\textsc{gf})\\ @\textsc{plural}(\%\textsc{gf})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-ang}$$

$$\langle\ [\mathrm{Agr_C}],\quad \Phi\left\{\begin{array}{l}(\uparrow \textsc{minusr}) = \%\textsc{gf}\\ @\textsc{participant}(\%\textsc{gf})\\ @\textsc{plural}(\%\textsc{gf})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-eg}$$

c. Marking both MINUSR

$$\langle\ [\mathrm{Agr_C}],\quad \Phi\left\{\begin{array}{l}@\textsc{speaker}(\uparrow \textsc{subj})\\ @\textsc{singular}(\uparrow \textsc{subj})\\ @\textsc{animate}(\uparrow \textsc{obj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-ag}$$

$$\langle\ [\mathrm{Agr_C}],\quad \Phi\left\{\begin{array}{l}@\textsc{participant}(\uparrow \textsc{subj})\\ @\textsc{singular}(\uparrow \textsc{subj})\\ @\textsc{animate}(\uparrow \textsc{obj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-ad}$$

$$\langle\ [\mathrm{Agr_C}],\quad \Phi\left\{\begin{array}{l}@\textsc{speaker}(\uparrow \textsc{subj})\\ @\textsc{plural}(\uparrow \textsc{subj})\\ @\textsc{animate}(\uparrow \textsc{obj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-angid}$$

$$\langle\ [\mathrm{Agr_C}],\quad \Phi\left\{\begin{array}{l}@\textsc{animate}(\uparrow \textsc{subj})\\ @\textsc{speaker}(\uparrow \textsc{obj})\\ @\textsc{plural}(\uparrow \textsc{obj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-amind}$$

$$\langle\ [\mathrm{Agr_C}],\quad \Phi\left\{\begin{array}{l}@\textsc{animate}(\uparrow \textsc{subj})\\ @\textsc{participant}(\uparrow \textsc{obj})\\ @\textsc{singular}(\uparrow \textsc{obj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-g}$$

$$\langle\ [\mathrm{Agr_C}],\quad \Phi\left\{\begin{array}{l}@\textsc{speaker}(\uparrow \textsc{subj})\\ @\textsc{singular}(\uparrow \textsc{subj})\\ @\textsc{participant}(\uparrow \textsc{obj})\\ @\textsc{plural}(\uparrow \textsc{obj})\end{array}\right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-agog}$$

d. Unspecified actor

$$\langle\ [\mathrm{Agr_C}],\quad \Phi\left\{\ @\textsc{short-passive}\ \right\}\rangle \quad \xrightarrow{\nu} \quad \textit{-ng}$$

- **Notes:**
  - The form *-amind*, realizing forms with a 3rd-person animate subject and a 1st-person plural object, is found only in more conservative dialects, including Nipissing Algonquin (Oxford 2014, 2019). In more innovative dialects, including Nishnaabemwin (Valentine

2001) and Southwestern Ojibwe (Nichols 1980), the form *-angid* is found in this context. In these dialects, the VI for *-angid* would include an f-description using local names for both MINUSR functions, such that one of the core arguments is 1st-person plural, and the other is 3rd-person animate.

- When the VI *-g*, marking a 3rd-person animate subject and a 2nd-person plural object, is present, the 2nd-person object direct Voice head *-in* is realized by an allomorph, *-ih*, which appears only in this context; the sequence of consonants /hg/ coalesces to [k] (Oxford 2019).
- Unlike independent-order and nominal inflection, inanimate arguments are unspecified for number in conjunct-order agreement.
- The phenomenon of n-registration is absent in conjunct-order Agr forms, which make reference only to SUBJ and OBJ.

4.3.3 Agreement clitics

- Ojibwe has two sets of agreement clitics that appear *only in independent-order contexts*: a set of proclitics that index the person of (usually) the subject, and a set of enclitics that index number and obviation of third-person arguments (usually the object) in certain contexts.
- The person proclitics (category PersCl) are introduced in Spec-TP in a node annotated $(\uparrow \text{MINUSR}) = \downarrow$; it indexes the person of either SUBJ or OBJ, whichever is higher on the relevant prominence hierarchy (here using the feature HEAR rather than SPEAK for the highest point in the hierarchy, meaning 2nd person outranks 1st person).

(26) *Person proclitics*

$$\langle \text{ [PersCl]}, \quad \Phi\left\{ \text{ @HEARER}(\uparrow) \right\} \rangle \quad \xrightarrow{\nu} \quad \textit{gi-}$$

$$\langle \text{ [PersCl]}, \quad \Phi\left\{ \text{ @PARTICIPANT}(\uparrow) \right\} \rangle \quad \xrightarrow{\nu} \quad \textit{ni-}$$

$$\langle \text{ [PersCl]}, \quad \Phi\left\{ \begin{array}{l} \text{@ANIMATE}(\uparrow) \\ ((\text{SUBJ} \uparrow) \text{ PLUSO}) \end{array} \right\} \rangle \quad \xrightarrow{\nu} \quad \textit{o-}$$

- **Notes:**
  - The label is changed from before.
  - The specification of *o-* was changed from @PROXIMATE(↑) to @ANIMATE(↑), reflecting that this form occasionally appears when both subject and object are obviative.
  - Note that the 3rd-person proclitic *o-* does not appear in intransitive forms (forms with neither OBJ nor OBJ_θ); there the Agr_I suffix *-w* appears instead.
- The number enclitics appear on a node in the specifier of AgrP,[15] which is annotated $\uparrow = \downarrow$; the @NUMCL template indicates which grammatical function's features are being specified, as defined in (28).

[15] In a fuller exposition of Ojibwe verbal inflection, which includes negation and modality, this will be revised so that these enclitics appear in spec-ModP, as they follow the modal suffixes. However, since we are omitting modal suffixes in this analysis, we will leave them here for now.

(27) *Number/obviation enclitics*

$\langle$ [NumCl], $\Phi\left\{\ \text{@NUMCL(AN-PLURAL)}\ \right\}\rangle \xrightarrow{\nu}$ *-ag*

$\langle$ [NumCl], $\Phi\left\{\ \text{@NUMCL(INAN-PLURAL)}\ \right\}\rangle \xrightarrow{\nu}$ *-an*

$\langle$ [NumCl], $\Phi\left\{\ \text{@NUMCL(OBVIATIVE)}\ \right\}\rangle \xrightarrow{\nu}$ *-an*

- **Notes:**
  - These morphemes mark number/obviation of OBJ if there is an OBJ present; of OBJ_θ if there is an OBJ_θ but no OBJ; and of SUBJ if there is neither PLUSO function present.
  - This is encoded in the @NUMCL template, defined as follows:

    (28) @NUMCL(template) := $\{[(\uparrow \text{OBJ})\ \&\ \text{@template}(\uparrow\text{OBJ})]\ |$
    $[\neg(\uparrow \text{OBJ})\ \&\ \text{@template}(\uparrow\text{OBJ}_\theta)]\ |$
    $[\neg(\uparrow \text{PLUSO})\ \&\ \text{@template}(\uparrow\text{SUBJ})]\}$

  - Alternatively, the context could be specified in the VIs themselves.
  - In all cases, they only index features of third-person arguments.
  - Homophonous morphemes are used to mark animate plural, inanimate plural, and (animate) obviation in nouns as well, though it's unclear if we will be able to use the same VIs for this context.

4.3.4 Other VIs used

- In addition to the agreement morphemes listed above, the following morphemes appear in the examples in Section 4.1 and the Appendix:

(29) $\langle$ [T], $\Phi\left\{\ (\uparrow \text{TENSE}) = \text{PST}\ \right\}\rangle \xrightarrow{\nu}$ *gii-*

$\langle$ [$\sqrt{\ }$], $\Phi\left\{\ (\uparrow \text{PRED}) = \text{'see'}\ \right\}\rangle \xrightarrow{\nu}$ *waab*

$\langle$ [v], $\Phi\left\{\ \text{@VTA}\ \right\}\rangle \xrightarrow{\nu}$ *-am*

$\langle$ [$\sqrt{\ }$, v], $\Phi\left\{\begin{array}{l}(\uparrow \text{PRED}) = \text{'eat'}\\ \text{@VTI-VAI}\end{array}\right\}\rangle \xrightarrow{\nu}$ *wiisini*

  - For most verbs in Ojibwe, the verb root and the v morpheme indicating the verb class are separate morphemes, as with *waab* and *-am*
  - However, the verb meaning 'eat' has suppletive forms for the three compatible verb classes (i.e., depending on transitivity and animacy of the object): *amw* 'eat.VTA', *miij* 'eat.VTI', *wiisini* 'eat.VAI'
  - This is analyzed as the verb exponing a span including both $\sqrt{\ }$ and v
  - We see the intransitive form *wiisini* in (31) below

5 Future research

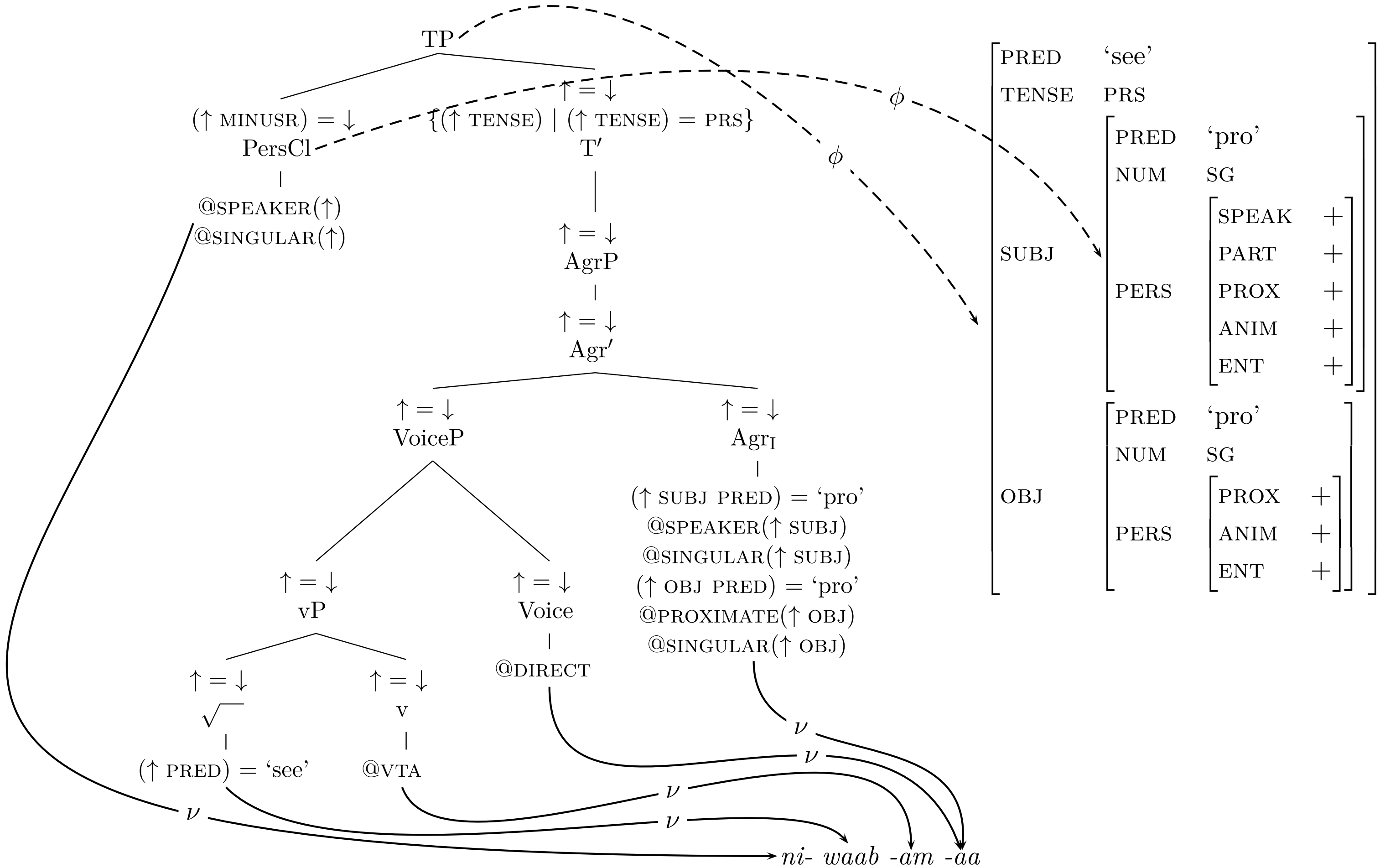
- We are currently in discussions with various researchers about phenomena that are otherwise difficult to account for, but which seem amenable to an L_RFG-style analysis, including:
  - Bronwyn Bjorkman's work on clitic-induced doubling in Ingush (Nakh-Dagestanian) and Breton (Celtic)
  - Michael Everdell's work on the argument-adjunct distinction and the interpretation of floating quantifiers in O'dam (Uto-Aztecan)
  - Oleg Belyaev's work on case inflection in Ossetic (Iranian)
- Another line of future research involves developing a more complete theory of portmanteaux, to facilitate analyses of fusional languages such as those found in Europe (e.g., English and French).

Appendices

A More examples

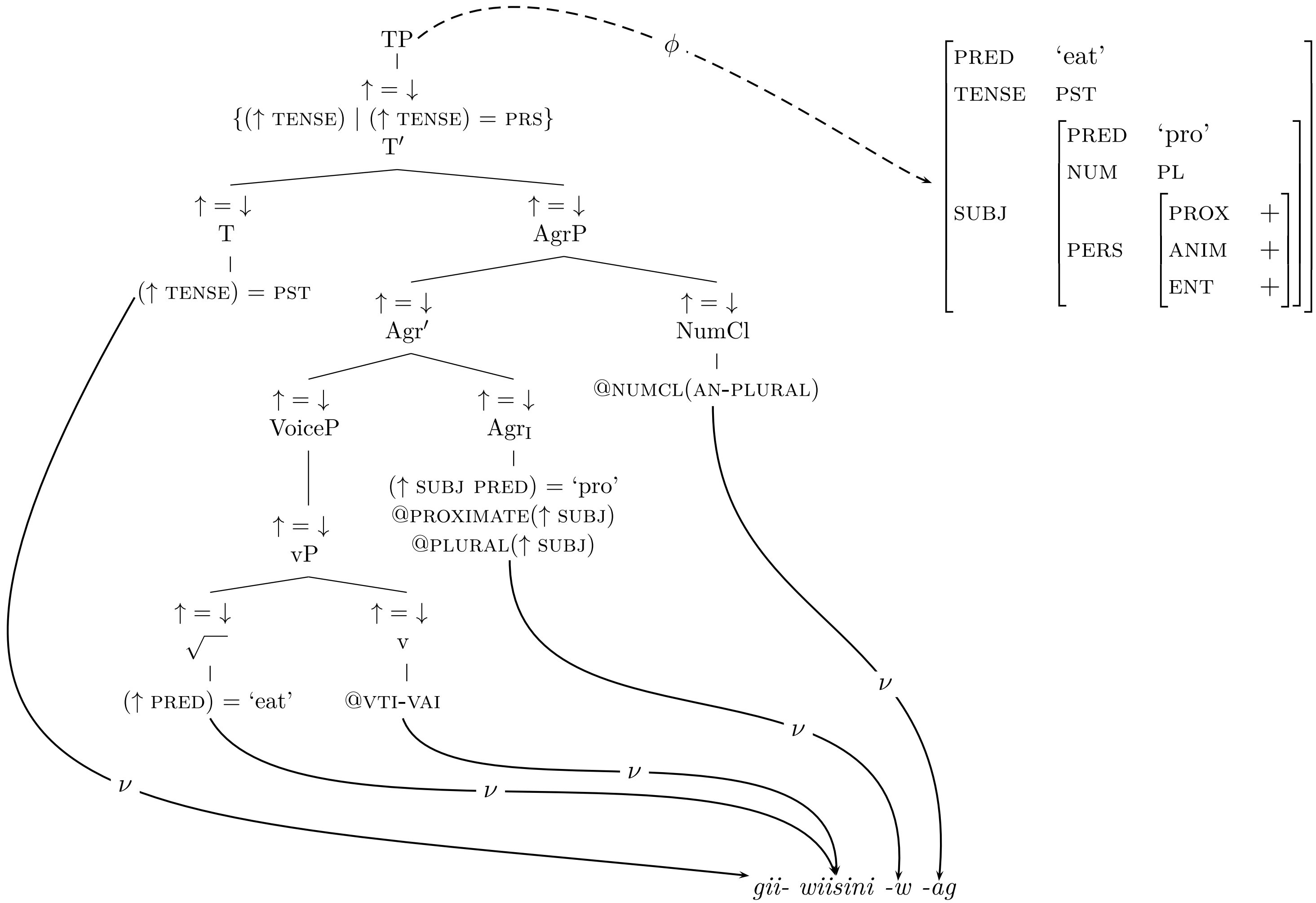
- Here we show more representative examples, demonstrating most of the templates and VIs introduced in Section 4

(30) ni- waab -am -aa
1 see VTA DIR
'I see him/her.'[16]



[16]This example includes the phenomenon referred to as Pac-Man Spanning (see footnote 5), in which a VI (here, *-aa*) spans an adjacent preterminal node (here, Agr) for which no other VI is available. As shown in 4.3.2, there are no VIs specified for the category Agr_{I} that are compatible with singular number – all of the Agr_{I} VIs are specified as ($\uparrow$ NUM) = PL. This means that, while the VI *-aa* is specified only for the category Voice and not for Agr_{I}, there is no v-structure that is more informative than one in which it also realizes the adjacent Agr head. In this way, (pre)terminal nodes that are necessary in the c-structure but for which there is no VI available can still serve as an input to the exponence function without the need for (stipulated) empty categories.

(31) gii- wiisini -w -ag
PST see.VAI 3 3PL
'They ate.'



B Revised Correspondence Architecture

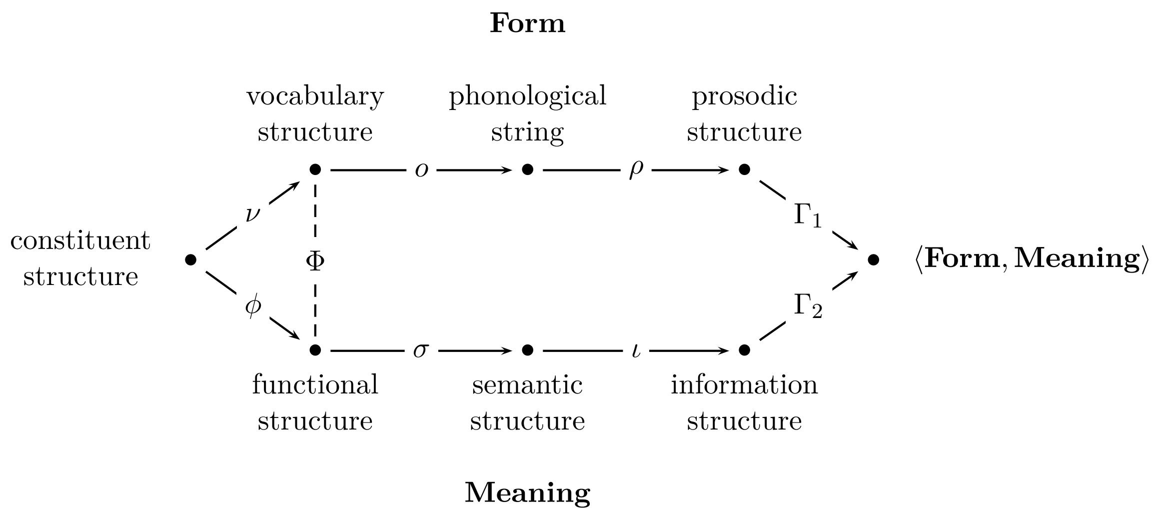


Figure 1: Correspondence Architecture

Notes:

- We assume that the morphological structure of Butt et al. (1996) is no longer necessary, given vocabulary structure, and that the Φ function would allow us to address the concerns of Frank and Zaenen (2002) regarding Butt et al. (1996); although the Φ function is not a correspondence function, but captures a relationship between vocabulary structure and functional structure. Details remain to be worked out.
- We have eliminated the independent level of argument structure based on the proposal that argument structure information is best captured at semantic structure (Asudeh and Giorgolo 2012).
- The output of the grammar, $\langle \Gamma_1, \Gamma_2 \rangle$, consists of a form–meaning pair, where the form incorporates prosody (still fed by constituent structure) and the meaning incorporates information structure (still fed by semantic structure).

C On conjunct order agreement

- In the account of conjunct-order Agr heads given in Section 4.3.2, we omitted an additional morpheme that follows the $\mathrm{Agr_C}$ heads in most instances when there is a 3rd-person animate plural argument, namely the suffix *-waa*.
- We are not yet sure how to analyze this morpheme, but our current tentative analysis involves splitting conjunct Agr agreement into two separate agreement heads:
  - The first, which we call $\mathrm{Agr_C}$, is realized in all conjunct-order forms, and indicates agreement with one or both of the core MINUSR arguments (subject and object; conjunct-order forms never show @NREG agreement or indicate OBJ_θ in any way); this includes the forms given in (25).

- The second, which we call $\hat{\mathrm{A}}\mathrm{gr}_{\mathrm{C2}}$, has only one realization, -*waa*, and indicates agreement with a 3rd-person animate plural core argument.
- As indicated by the "roof" notation ($\hat{\mathrm{X}}$), $\hat{\mathrm{A}}\mathrm{gr}_{\mathrm{C2}}$ is a non-projecting head (Toivonen 2001, 2003); we analyze it as forming a complex head with the $\mathrm{Agr}_{\mathrm{C}}$ head (see Oxford 2018 for an analogous analysis in a Minimalist DM framework, using fission), captured by the following c-structure rule:

(32) $\mathrm{Agr}_{\mathrm{C}} \rightarrow \mathrm{Agr}_{\mathrm{C}} \quad (\hat{\mathrm{A}}\mathrm{gr}_{\mathrm{C2}})$

- In addition to -*waa*, there is a spanned, portmanteau VI -*waad* which spans the $\mathrm{Agr}_{\mathrm{C}}$ and $\hat{\mathrm{A}}\mathrm{gr}_{\mathrm{C2}}$ heads in (many) instances where the subject is 3rd-person animate plural form (currently listed in (25a) as realizing only $\mathrm{Agr}_{\mathrm{C}}$).

• However, this analysis has a few problems:

- The rule in (32) in its current form is recursive, and therefore overgenerates, predicting it should be possible to have any number of -*waa* morphemes present indexing the same argument (this is obviously not the case). We are not sure how to fix this.
- There is a homophonous -*waa* morpheme in the independent-order Agr category ($\mathrm{Agr}_{\mathrm{I}}$); ideally this state of affairs should be avoided by positing a single, underspecified -*waa* morpheme. However, we are not sure if the two can be unified. (Furthermore, it may be that the two differ in their allomorphic properties, in which they should in fact be considered separate morphemes. We are still looking into this.)

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