

## Program of Work: “Syntax at the interface: evidence from Ojibwe”

**Introduction** Every utterance in a language exists on three different levels: structure (syntax), meaning (semantics) and sound (phonology). It has long been known that these different levels of grammar do not exist in isolation but interact with each other (e.g. Selkirk 1981, 1984, Rice 1992, Cowper and Rice 1987, Kahnemuyipour 2004, Wagner 2005a, Piggott and Newell 2006, Grohmann 2009). Thus, looking at phenomena that take place on one level may provide important clues about the others. Phonology, in particular, plays a critical role in providing information about the structure of words and sentences, with phonological processes often being sensitive to syntactic boundaries. With the advent of the Minimalist Program (Chomsky 1995, 2000), the idea of this interaction has been taken to a new level. Syntax is seen primarily as the mediator between phonology and semantics, i.e. syntactic representations are inputs to both phonological and semantic interpretations. However, the exact nature of this interaction is still a matter of debate. This project will investigate the way syntax and phonology interact with each other by focusing on Oji-Cree (a dialect of Ojibwe, an Algonquian language).

Ojibwe morphosyntax is a promising ground for such a project. It is a polysynthetic language, and a single word there can be thought of as the equivalent of an English sentence:

- (1) Ni-kii- pihci- kishaaptapi-[waapoos-iwi- hse- h- itisi]- min  
 1-PAST-by.accident-fast- rabbit-be.INTRANS-INCH-TRANS-REFLEX-1.PL  
 ‘We’ve accidentally suddenly turned ourselves into rabbits.’

Within such a “word” one expects to find close phonological relations between its constituents on the one hand, and a complex syntactic structure on the other. Therefore, looking at the structural relationship between morphemes in a verbal complex and the phonological cues for those relationships might shed light on the way syntax and phonology interact with each other.

The relationship between morphemes in the Ojibwe verbal complex is still poorly understood. The verb stem, in particular, is traditionally described as consisting of three elements identified by their position relative to each other – *initial*, *medial* and *final* (Bloomfield 1946, 1958, Wolfart 1973, Valentine 2001). Although it is recognized that the structure of the stem is more complex than this three-element approach predicts (e.g., Rhodes 1976, Goddard 1990, O’Meara 1990, Hirose 2003), the exact structure of the stem and the relationship between its components remains a matter of debate. In my dissertation I advance a proposal about verb stem formation in Oji-Cree, situating it within the current syntactic theory. I draw evidence for the structure from both syntactic and phonological processes. My proposal raises questions that are at the heart of the research on syntax-phonology interaction, including (a) what types of (morpho)syntactic domains are relevant for phonology? (b) what phonological phenomena are expected to be sensitive to syntactic boundaries? (c) to what extent do syntactic constituents correspond to phonological constituents? These questions will be the focus of this project. The goal of this project is twofold: first to shed light on the syntax-phonology interaction by bringing data from a lesser-studied language, and second, to better understand the syntax of the Ojibwe word through a careful study of this interaction.

**Theoretical framework** My research is carried out in the framework of Distributed Morphology (Marantz 1997, 2001) and a particular theory of interfaces within the Minimalist Program, Phase Theory (Chomsky 2001, 2005, Marantz 2007).

The central assumption of Distributed Morphology is that word formation is a syntactic process that proceeds by first joining roots that are not specified for category (e.g., noun, verb)

with functional heads (Marantz 1997, 2001). According to this assumption, the verb stem in Algonquian is a  $\nu$ P (verb phrase) that is formed by joining a bare root with a verbal head  $\nu$  (e.g. Brittain 2003). Correspondingly, nouns and adjectives are formed with the help of the functional heads  $n$  and  $a$ , respectively.

Phase Theory (Chomsky 2001, 2005, Marantz 2007) assumes that syntax creates chunks of structure that are sent to the interfaces (i.e. to Spell-Out) for phonological and semantic processing. These chunks of structure are called phases. Once a phase is completed and interpreted phonologically and semantically, the material inside that phase is no longer accessible to further operations.

Which syntactic categories correspond to phases is a subject of much discussion (Boeckx and Grohmann 2007, Gallego 2007, Boeckx and Grohmann 2007, Frascarelli 2006, Kratzer and Selkirk 2007, Marušič 2005). Under the original formulation by Chomsky (2001), only transitive  $\nu$ Ps and CPs (sentences) are phasal domains. However, later views assume that other kinds of syntactic constituents can also be considered phases. I adopt the view that phases exist at the word level (e.g. Marantz 2001, Marvin 2002, Arad 2003, 2005, Di Sciullo 2005, Piggott and Newell 2006). In Algonquian, in particular, the  $\nu$ P (verb stem) has been argued to be a phase (e.g. Piggott and Newell 2006). It is a matter of ongoing debate (both for Algonquian and in general) whether other categories ( $n$ Ps,  $a$ Ps) are phases. One of the goals of this project is to contribute to this debate by bringing data from a lesser-studied language.

Because phases are relevant to phonological interpretation, various phonological processes have been used to diagnose phase boundaries (Kahnemuyipour 2004, Marvin 2002, Arad 2003, Piggott and Newell 2006). For Ojibwe, in particular, Piggott and Newell (2006) argue that the presence of vowel hiatus (sequences of vowels) is indicative of a phase boundary. According to them, when combining two morphemes results in a sequence of two vowels, one of the vowels is deleted if this sequence is within a phase, but deletion does not take place across a phase boundary. Piggott and Newell's (2006) argument is crucial to my inquiry. While it successfully accounts for the distribution of vowel hiatus, their conclusion about the syntactic structure is in conflict with the phonological evidence presented in my dissertation. This conflict poses a challenge for Phase Theory, and will serve as the starting point of the proposed project.

**Research questions and goals** This project is a direct extension of my doctoral dissertation. My dissertation, "The structure of the Oji-Cree verb", advances a proposal about verb stem formation in Oji-Cree, drawing evidence for it from syntax and phonology. The central proposal in my thesis is that in Oji-Cree there are two types of stems that differ with respect to the complexity of their structures. A simple stem (2) is a  $\nu$ P that is formed by simply merging the root and the  $\nu$ -head. In complex stems (3), the root joins with a verbal head  $\nu$  and results in a constituent that is phonologically and semantically salient but syntactically deficient, and thus cannot be a complete stem. In these stems, another syntactic constituent (*pimi*- 'along' in (3)) must obligatorily appear to the left of the root to make it a full stem.

(2)     [ $\sqrt{\text{on-te}}$ ]<sub>stem/ $\nu$ P</sub>  
          boil-VII  
          'It [inanimate] is boiling.'

(3)     [[*pimi*]-[ $\sqrt{\text{pah-too}}$ ]]<sub>stem/ $\nu$ P</sub>  
          along-run-VAI 3  
          'S/he is running along.'

Thus, the main distinction between the two stem types is that the simple stem is built directly from a root, while the immediate constituents of the complex stem are two syntactic categories. I bring evidence for this by showing that the structure of the complex stem is very

productive, predictable, and subject to syntactically-motivated restrictions, while the same is not true of the simple stem.

Phonological evidence for the distinction between the two stem types comes from the process of *t*-palatalization (the change from [t] to [tʃ], spelled *c*). Contrary to previous views (e.g. Wolfart 1973, Rhodes 2008), I argue that palatalization is a productive process that provides evidence for syntactic structure. The vowel *i*, which appears to be epenthetic in both simple and complex stems, triggers palatalization in the latter (5) but not the former (4). I argue that in complex stems, this vowel is not actually epenthetic but a morpheme that marks the category of the stem-internal modifier *aP* (following Piggott and Newell's (2006) proposal for stem-external modifiers). By contrast, the vowel *i* in simple stems is epenthetic, being present solely for phonological purposes. It is inserted late and is not able to trigger palatalization.

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|-----|-----------------------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------------------------------------|
| (4) | [√maat- <b>i</b> -hse <sub>stem/vP</sub> ]<br>start-EPENTH-VII.INCH<br>'It [an event] has started.' | (5) | [[piici]-[√pah-too <sub>vP</sub> ] <sub>stem/vP</sub> ]<br>here-run-VAI 3<br>'S/he is running in this direction.' |
|-----|-----------------------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------------------------------------|

While the proposal in my thesis successfully accounts for the stem structure in Oji-Cree, it poses a challenge for Phase Theory. The complex stem is argued to consist of two morphosyntactic domains. In this respect, the structure of complex stems seems completely parallel to constructions involving a whole stem plus a stem-external modifier (7). In fact, for the purposes of palatalization the two behave identically. The construction in (7) is bi-phasal. Thus, by analogy, we would expect the construction in (6) (complex stem) to be bi-phasal as well.

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|-----|----------------------------------------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| (6) | [[piici <sub>aP</sub> ]-[√pah-too <sub>v'</sub> ] <sub>stem/vP</sub> ]<br>here-run-VAI 3<br>'S/he is running in this direction.' | (7) | [piici <sub>aP</sub> ]-[[pimi <sub>aP</sub> ]-[√pah-too <sub>v'</sub> ] <sub>stem/vP</sub> ]<br>hither-along-run<br>'S/he is running in this direction.' |
|-----|----------------------------------------------------------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------|

However, there is evidence against a bi-phasal view of a complex stem like (6). First, in my thesis, I present syntactic evidence that the stem-internal domain in a complex stem is not a phase. Certain higher-level modifiers (sentence-level, agent-oriented, aspectual) cannot appear inside complex stems, suggesting that the boundary in question is lower than a phase boundary. For example, the sentence-level adverbial *mate*- 'over there' can combine with a full stem (9) but is ungrammatical inside a complex stem (8):

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|-----|---------------------------------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (8) | *[[mate <sub>aP</sub> ]-[√pah-too <sub>v'</sub> ] <sub>stem/vP</sub> ]<br>over.there- run-VAI 3<br>'S/he is running over here.' | (9) | [mate <sub>aP</sub> ]-[[pimi <sub>aP</sub> ]-[√pah-too <sub>v'</sub> ] <sub>stem/vP</sub> ]<br>over.there-along- run-VAI 3<br>'S/he is walking over here.' |
|-----|---------------------------------------------------------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------|

Second, hiatus on the boundary inside the complex stem is obligatorily resolved by deleting one of the vowels (10), suggesting (after Piggott and Newell 2006) that the boundary in question is not a phase boundary.

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|------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (10) | piit-aahkwashiwe<br>[[piici <sub>aP</sub> ]-[√aahkwash-iwe <sub>v'</sub> ] <sub>stem/vP</sub> ]<br>hither- paddle-VAI 3<br>'S/he is paddling here.' | (11) | piici-aakaamohse<br>[piici <sub>aP</sub> ]-[[aakam <sub>aP</sub> ]-[√vohse <sub>v'</sub> ] <sub>stem/vP</sub> ]<br>hither-across-walk.VAI<br>'S/he is walking over here.' |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

The question is how to reconcile these facts within the Phase Theory. On the one hand, palatalization suggests that in a complex stem ((6), (8), (10)) the constituents are spelled out in different phases; on the other hand, according to the distribution of hiatus, there is one phase.

During the tenure of the post-doctoral position I plan to deal with this problem and with the general question of what constitutes a phase in Oji-Cree. In order to deal with the problem outlined above, I plan to 1) reconsider each of the assumptions involved; 2) re-examine some of the general assumptions about the identity of phases found in the theoretical literature; 3) look at data from other phonological processes in Oji-Cree sensitive to morphosyntactic boundaries.

First, I plan to reconsider each of the assumptions involved by looking at more data and considering potential alternative views. Is the presence of hiatus really indicative of a phase boundary, or can it be explained in a different manner? Does the presence of palatalization necessarily mean that the constituent is a phase? These lead to larger, more general theoretical questions. What (type of) phonological phenomena are needed to indicate that a certain syntactic constituent is a phase? How phonologically salient does a constituent have to be to constitute a phase? Is the phase the only syntactic domain that is relevant to syntax-phonology interaction?

While I have limited the scope of my thesis to the primary derivation of verbs (verb formation from bare roots), in this phase of my work I plan to also study secondary derivation (word formation from other words) of verbs and formation of nouns, and consider various phonological processes that take place at the relevant syntactic boundaries. The phonological processes include *t*-palatalization in secondary derivation, *e-aa* alternation, *w*-epenthesis, vowel lengthening, and *w*-vocalization as well as stress assignment and syllabification.

My research is entirely based on the original data I have collected during regular fieldwork trips to Kingfisher Lake, a native community in Northern Ontario. During my graduate studies, I have made six such trips. For this project, I intend to continue visiting the community to collect more data, as well as work from the literature on other Algonquian languages.

To summarize, this project will make two important contributions. First, it will bring new (types of) data to bear on the theoretical issues of the syntax-phonology interface, and will allow a deeper understanding of the theoretical paradigm based on material from a lesser-studied language. Second, it will provide new material on the language, which will be of value for further linguistic research, and will allow a better understanding of the structure of the language.

**Relation to Proposed Department** The Linguistics Department at McGill is a perfect setting to carry out the proposed research program. This department constitutes an extremely active scholarly community with research interests directly relevant to my research program. Glyne Piggott's work on Algonquian languages and phonology-syntax interface (Piggott 1974, Piggott and Grafstein 1983, Piggott 1989, Piggott and Newell 2006) has significantly informed my work. The department's general strength in theoretical syntax and syntax at interface will be greatly beneficial to my own research interests. In particular, Lisa Travis's research on verb structure and the interaction of structure and meaning cross-linguistically (Travis 2000a, b, 2010) and Michael Wagner's work on the interaction of phonology and structure (Bachrach and Wagner 2007, Wagner 2005a, b, 2010) are directly related to my inquiry. Additionally, the McGill Syntactic Interfaces Research Group will be an invaluable resource for my research.