Consolidated Morphology

A Non-Distributed, Purely Syntactic Theory of Morphology

Benjamin Bruening (University of Delaware)

rough draft, August 23, 2017; comments welcome

Contents

Chapter 1

Introduction

This work is concerned most broadly with the question of the overall architecture of the grammar. More specifically, it is concerned with the modules of grammar commonly referred to as *morphology* and *syntax*. In many models of grammar, the module of morphology is responsible for putting together morphological objects, in particular *words*, while the syntax takes words as atomic units and puts them together to form phrases, clauses, and sentences.

In contrast to this type of model, much recent work in linguistics has argued for the desirability of doing away with a dedicated component of grammar for word formation. Instead, there is only a single component of grammar that puts together all complex objects, whether those objects include sub-word units or phrasal units. In such a model, there is a single component of morphosyntax, rather than separate components of syntax and morphology. Publications arguing for such a view include Sadock (1980), Baker (1985), Sproat (1985), Lieber (1988, 1992), Hale and Keyser (1993), Halle and Marantz (1993), Marantz (1997), Borer (2005), Haspelmath (2011); see especially Bruening (2014b, 2017a). I will assume here that such an approach is indeed advantageous. Assuming this, I will address the question of what form the model of grammar should take within this broad framework. In particular, how should morphology be modeled as a part of syntax?

The most prominent approach to morphology within this type of framework is Distributed Morphology (Halle and Marantz 1993). Distributed Morphology has been justly criticized for its overly complicated architecture and its reliance on a large set of theoretical devices (e.g., Caha 2013). As I will show, the foundational assumptions of Distributed Morphology are also flawed in fundamental ways. I will argue that we can have a much simpler model of morphosyntax if we reject these assumptions and rethink the architecture of the morphosyntax. In particular, we can do without all morphology-specific processes, and only need to recognize the operations of Merge and Agree, which are necessary for phrasal syntax, as well. We can also do without multiple levels, and in particular the strict separation of the syntax from a level of Morphological Structure. Instead, there can be just a single level, the morphosyntax.

I will refer to the model of morphosyntax proposed here as *Consolidated Morphology*. This name was chosen both to highlight how different it is from Distributed Morphology (since *distributed* and *consolidated* are antonyms), and because it is an apt description: there is no complicated architecture with multiple levels, and there are very few theoretical devices, in fact none that are particular to morphology. Morphology has been consolidated to the bare minimum, and in fact is just part of syntax.

One of the important points that enables this consolidation is the rejection of the logic that requires the strict separation of phonology from syntax. Phonology is supposed to be invisible to syntax, but morphology can be sensitive to phonology. This is an apparent stumbling block for the consolidation of syntax and morphology into a single component. It is what led Distributed Morphology to postulate a complicated architecture with multiple levels of syntax that only have access to syntactic features, and a post-syntactic

level of Morphological Structure where phonological items are inserted. I show that we can do without this separation entirely, and phonological and semantic information can be (and in fact must be) present throughout the syntax. This will have numerous beneficial consequences, the most important of which is a massive simplification of the model of grammar that we need.

Another benefit of the model proposed here that should be highlighted up front is that it permits lexical storage of complex syntactic objects. This is something that is impossible within the architecture of Distributed Morphology but is known to be necessary for numerous phenomena, phrasal idioms most obviously (e.g., Di Sciullo and Williams 1987, Jackendoff 2002, Kobele 2012). In Distributed Morphology, all information has to be stored in the lexical entry of a root; in the model here, syntactic, phonological, and semantic information is instead stored in complex objects. Roots play a very diminished role in Consolidated Morphology.

1.1 Overview of the Model

In Consolidated Morphology, the model of grammar is the simplest possible. There is a component of grammar that puts things together, the *morphosyntax*. There is a storehouse for objects, both simplex and complex, the *lexicon*. Stored objects can be of any size; they can include phrases, sentences, even whole discourses (jokes and stories, e.g.). Stored objects are not atomic, but can be modified once fed back into the morphosyntax to combine with other things.

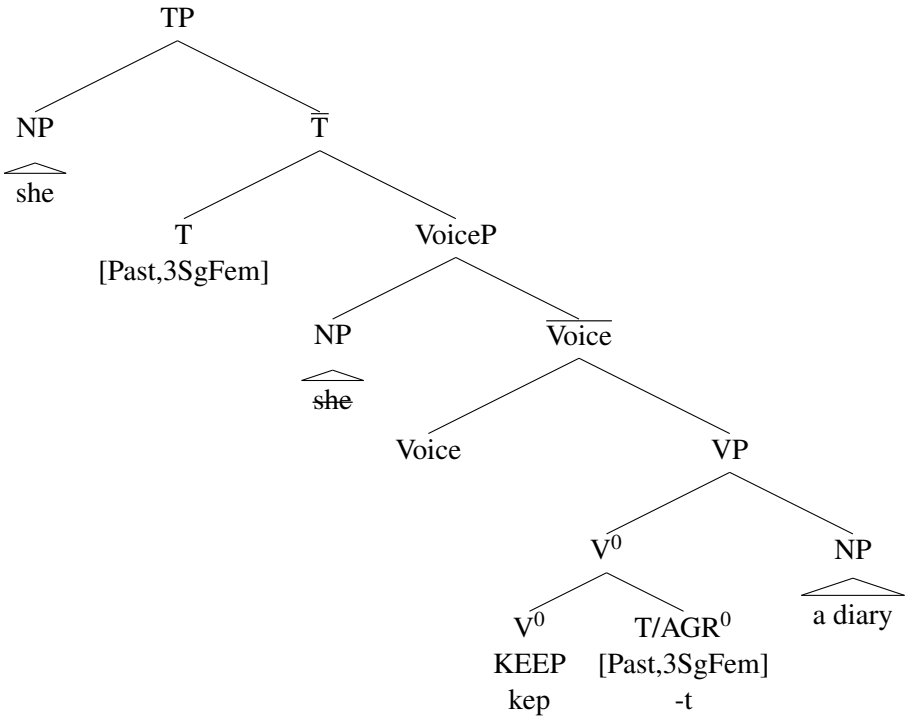
The units that the morphosyntax manipulates are features, heads (X^0s), and phrases (XPs). There is no unit called a "word." Syntactic units map to phonological units, the elements of the prosodic hierarchy. In many cases X^0s map to a level known as the Prosodic Word, but there are also numerous mismatches.

There are no levels in the morphosyntax. Instead, objects are put together, using Merge (Chomsky 2000), until a derivation is finished. Morphemes (the smallest items stored with a structure, a phonology, and a semantics) are inserted in terminal nodes as the derivation is built. Lexical roots are present in an abstract form with their (abstract) phonological and semantic information from the beginning. A concrete allomorph is inserted into the terminal node of the abstract root as soon as the maximal X^0 dominating that root is completed and the X^0 is about to be merged with phrasal categories. At that point, morphemes are inserted into all terminal nodes dominated by the X^0. Thus, morpheme insertion is interleaved with structure building.

Morphemes are underspecified and have to match a subset of the features on the terminal node in order to be inserted. If more than one morpheme could be inserted into a given terminal node, then they are ranked according to the Elsewhere Principle (Kiparsky 1973), which says that the one that is the most highly specified will take precedence.

The only other morphosyntactic operations we need are Agree and feature insertion and deletion. Complex verbs are put together purely by Merge, not by head movement. A Clause Matching Principle ensures that a terminal node merged with the verb has to Agree with a head in the clause, against which it checks its features. Particular languages have well-formedness conditions requiring certain heads to have other heads merged with them. To illustrate with English, the verb in English always has a T/AGR node adjoined to it (for "Tense/Agreement"):

(1)



The T/AGR node has to Agree with a clausal T(ense) head. The clausal T head Agrees with the subject NP, checking features like [3SgFem] in this example. It also has a tense feature inherently, in this case [Past]. T checks these features against the same features on the T/AGR node that was merged with the verb. The verb does not move anywhere in English; complex heads are not put together through head movement.

In the example in (1), the V^0 is at first just the abstract root KEEP and the feature specification [Past,3SgFem] on T/AGR. Once KEEP and T/AGR are merged to produce the higher V^0, as the last step before merging V^0 with the object NP, morphemes are inserted into the terminal nodes. KEEP has an allomorph *kep* that is inserted in the local context of [Past]. [Past] T/AGR has an allomorph *-t* that is inserted in the local context of particular roots, including KEEP (as well as SWEEP, LEAP, ...). Once *kep* and *-t* are inserted, the V^0 is merged with the object NP, and the full phonological and semantic information of *kept* is present for the rest of the derivation.

This is the entire theory; nothing else is necessary. We only need one level of grammar, and the only morphosyntactic operations we need are Merge, Agree, feature insertion and deletion, and morpheme insertion, which is interleaved with structure building. There are also language-particular constraints on what heads merge with what, and how features are combined in the morphosyntax, but every theory of morphosyntax has to recognize this and allow for it.

This is a much, much simpler theory of morphology than Distributed Morphology. It does not have multiple levels of grammar like Distributed Morphology, and it does not have a post-syntactic level of Morphological Structure where morphology-specific mechanisms like local dislocation, fission, and fusion apply. Consolidated Morphology does without such mechanisms entirely. As I will show, this model also has numerous empirical advantages, in addition to its advantage in simplicity. It enables better analyses of disparate phenomena, including perennially problematic ones like English comparatives and superlatives. The theory is also simpler than other theories of morphology besides Distributed Morphology (e.g., Anderson 1992, Stump 2001), and it has an advantage over most of them in that it also includes an explicit theory of syntax. Not only is this theory of syntax explicit, morphology and syntax are seamlessly integrated, such that morphology just *is* syntax. The only mechanisms used in the morphology are those used in the syntax generally.

1.2 Outline of the Book

Chapter 2 begins by laying out the architectural assumptions of the model. These include the following: (1) that phonological, semantic, and morphosyntactic information does not need to be strictly separated and can be included—together—from the beginning; (2) there is only one list of stored items, the lexicon; (3) items that are stored in the lexicon include full syntactic structures as well as phonological, morphosyntactic, and semantic information associated with them; (4) there is no level of Morphological Structure separate from the syntax, instead there is only a single level of morphosyntax.

After motivating these architectural assumptions, chapter 3 outlines the mechanisms that are used in Consolidated Morphology. I argue against the view that complex morphological objects are put together through head movement as in most syntactic theories of word formation (e.g., Baker 1988, Hale and Keyser 1993, Halle and Marantz 1993). Instead, they are put together directly through Merge. A Clause Matching Principle requires that heads adjoined to the verb have to Agree with heads in the clause. This does not require one-to-one matching, so we see multiple exponence, zero exponence, and displaced exponence (very common with negation, for instance). In fact, Merge and Agree, two syntactic mechanisms, are the only mechanisms we need for morphology.

Chapter 4 goes through several case studies in detail to illustrate how the theory works. These case studies are English verbal morphology; English comparatives and superlatives; Classical Arabic verbal morphology; Classical Armenian nominal declensions; and Passamaquoddy-Maliseet verbal morphology. English verbal morphology is analyzed in order to provide a concrete analysis of an Indo-European language, without using head movement, affix hopping, post-syntactic lowering, or any other mechanisms. This necessitates a different approach from the standard one to *do*-support and negation, which I provide. English comparatives and superlatives are important because they include a phonological and a semantic condition on an analytic-synthetic alternation. This makes them especially problematic for theories of morphology and syntax. I show that the architecture of Consolidated Morphology provides us with a simple and satisfying account of their properties. Classical Arabic is important as it involves nonconcatenative morphology. It also presents a case of apparent blocking across morpheme "slots" or "rule blocks" (Noyer 1992). I show how both can be analyzed in Consolidated Morphology. Classical Armenian involves a complex pattern of synthetic versus agglutinating morphology (Caha 2013). I show that allowing morpheme insertion into spans of terminal nodes (Merchant 2015), also used for Classical Arabic, provides a simple and elegant account of the patterns. For both Classical Arabic and Classical Armenian, we can do without all of the Distributed Morphology mechanisms of fusion, fission, and local dislocation; we can also do without the complicated Antisymmetry and Nanosyntax assumptions of Caha's (2013) analysis. Finally, Passamaquoddy-Maliseet is a polysynthetic language with very complex verbal morphology. I provide an explicit syntactic analysis and an explicit morphological analysis that accounts for all of the facts. Passamaquoddy-Maliseet is also used in earlier chapters to illustrate problems with head movement accounts of verbal morphology; I show how all of these problems are solved with the minimal mechanisms of Consolidated Morphology. Passamaquoddy-Maliseet also shows us that we need non-local conditions on contextual allomorphy.

Through chapter 4, the main theory of comparison for Consolidated Morphology is Distributed Morphology. Both of these are purely syntactic theories of morphology. Chapter 5 turns to the primary alternative approach to morphology that is not a syntactic theory, paradigmatic theories like that of Stump (2001). Proponents of paradigmatic theories have presented various arguments against purely syntactic theories of morphology and for paradigmatic theories. I show that these arguments are without force. Purely syntactic theories of morphology have numerous advantages, including that they have explicit theories of syntax. Paradigmatic theories typically do not, and are completely divorced from syntax. Consolidated Morphology, in contrast with paradigmatic theories, has no morphology-specific theoretical devices. Every mechanism of morphology is a mechanism of the syntax.

Finally, chapter 6 concludes with a summary and future outlook.

Before beginning, it is necessary to say another word about Distributed Morphology. Because Distributed Morphology is the most direct competitor to Consolidated Morphology, as the most prominent of those theories that assume a purely syntactic approach to word formation, a lot of what follows addresses Distributed Morphology directly. I will point out issues with Distributed Morphology in order to motivate the alternatives proposed in Consolidated Morphology. At the same time, however, Consolidated Morphology has a lot in common with Distributed Morphology. Both assume that complex objects (including "words") are put together by the syntax. Both propose a realizational model, where morphemes realize abstract morphosyntactic features. Morpheme insertion works the same way in both theories, according to the Subset Principle and the Elsewhere Principle. One of the specific analyses proposed here, the analysis of English verbal inflection in section 4.1, looks a lot like the Distributed Morphology analysis, despite real differences in architectural assumptions and approaches to specific phenomena like *do*-support. In fact, I believe that many specific Distributed Morphology analyses could be translated easily into Consolidated Morphology analyses, often with real benefits. Thus, although this book is critical of Distributed Morphology, it owes a great deal to it, and builds on its advantages.

Chapter 2

Architecture

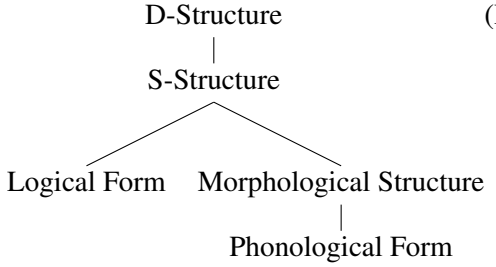
I begin with broad assumptions about architecture. As stated in the introduction, I assume that there is no separate component of grammar that builds words. Instead, there is only a single component of grammar that assembles all complex objects, whether those are words or phrases. I will call this component the *morphosyntax*.

One pressing issue for an approach with only one component is that morphology can be sensitive to phonology but syntax is not supposed to be. This is an odd state of affairs if there is no difference between morphology and syntax. If they are the same, then they should be alike in either being sensitive to phonology, or in being insensitive to it. This apparent contradiction is what led to the "distributed" part of Distributed Morphology: a syntax that is free of phonology, but with a distinct level of Morphological Structure where elements can be sensitive to the phonology of items once they are inserted. In this chapter, I show that the motivation for this separation is flawed. I also provide an alternative, and discuss the numerous advantages of this alternative.

2.1 The Distributed Morphology Architecture

I begin with an outline of the model of morphology and syntax proposed in Distributed Morphology. This model is shown in (2). The derivation of a sentence starts with a deep structure (D-Structure) that undergoes various syntactic processes to produce a surface structure (S-Structure). At this point the derivation branches, with one side going to the level of logical form (LF), the input to semantic interpretation, and the other going to phonological form (PF):

(2) (Halle and Marantz 1993, 114, (1))



(This model is simply a modification of the Government and Binding model of syntax proposed in Chomsky 1981.)

Importantly, syntactic derivations manipulate only abstract syntactic features at the levels of deep structure, surface structure, and LF. Phonological forms are not inserted until the level of Morphological Structure on the PF branch. Thus, the three purely syntactic levels have no access at all to phonological information.

Only at Morphological Structure is such information available. At the level of Morphological Structure, actual morphemes ("Vocabulary Items") are inserted, and various manipulations of the syntactic structure can take place. Some of these manipulations can be sensitive to the phonology of the items that have been inserted.

2.2 The Flawed Logic of Separation

Distributed Morphology, and indeed most current theories of grammar, accepts Zwicky's (1969) Principle of Phonology-Free Syntax and strictly separates the information contained in the module of phonology from the module of syntax. As just explained, the levels of deep structure, surface structure, and LF lack phonological information altogether in Distributed Morphology.

As an example of the way syntax is supposed to be phonology-free, consider head movement of the kind that raises verbs to T(ense) in French or to C(omplementizer) in verb-second languages like German. This head movement process is never sensitive to phonology. For example, no language has a head movement rule that raises only verbs that start with [b] to T. Similarly, no verb-second language raises only verbs with two syllables to C but not verbs with only one syllable. As another example, this time from phrasal movement, no language has wh-movement for wh-phrases that end with a sonorant but wh-in-situ for wh-phrases that end in an obstruent.

Because of this apparent insensitivity of the syntax to phonology, many current approaches propose that phonological properties of lexical items are simply not visible to the syntax. In Distributed Morphology, the syntax deals only with bundles of abstract morphosyntactic features, and actual lexical items are not inserted until the post-syntactic component of Morphological Structure, as explained above. This makes the phonological properties of those items unavailable to the syntax. Similar architectural assumptions of modularity are made in other approaches, as well.

Distributed Morphology relegates more than just phonological information to the post-syntactic component. Following the same logic, Distributed Morphology also locates agreement at the post-syntactic level of Morphological Structure: just as no V-movement rule is sensitive to phonology, there is also no V-movement rule that targets only verbs that agree with a first person subject (cf. Harris 2017, 206–207). Similarly, Halle and Marantz (1993) say that verb class morphemes (e.g., theme vowels in Romance) must also be inserted post-syntactically, because again no V-to-T rule in Romance languages targets only verbs of one class. "By placing them in this part of the grammar, we account for their lack of effect in the syntax or at LF," say Halle and Marantz (1993, 135).

This logic is flawed, however. Consider the following. The difference between a transitive and an intransitive verb must be present in the syntax, because it makes a difference to what phrase structure is projected, what auxiliary is selected (in some languages), what form a causative will take (in many languages), etc. At the same time, however, no language has a V-to-T movement rule that targets only transitive verbs and not intransitive verbs. Similarly, Halle and Marantz (1993) conclude that features that distinguish count from mass nouns must be part of the syntax, because they make a difference to determiner selection, quantifier selection, etc. Again, however, no rule of wh-movement, topicalization, or raising targets only count nouns and not mass nouns. Furthermore, the whole point of Relativized Minimality (Rizzi 1990) was that particular syntactic operations only care about *one particular thing*: A-bar movement can only see A-bar positions, A-movement can only see A-positions, and head movement can only see head positions. None of them can see other types of positions, nor can they see the actual content of the positions they are concerned with. Importantly, the content these syntactic processes cannot see includes purely *syntactic* content. For example, there is no topicalization rule that targets only NPs that have a postnominal PP or CP, although the presence of a PP or CP is certainly visible to the syntax, since the syntax is what put it there in the first place. Similarly, no language has a raising rule that targets only *coordinated* NPs, but again it is the syntax that

creates coordinated structures, and so the syntax must be able to see the difference between a coordinated NP and a non-coordinated NP.

In other words, syntactic operations are even more blind than they should be in the architecture of Distributed Morphology. Even information that must be part of the syntax is irrelevant to particular syntactic processes. Taking head movement as an example, the only thing that head movement ever has access to is head status and syntactic category. Syntactic category must be visible because verbs but not adjectives might move in some language; in English, Aux(iliary)V(erb)s but not main Vs move (and I assume that this is a category difference). On Halle and Marantz's logic, this should mean that there is a standalone component of head movement, with no information present except syntactic category and head status. There must be another, completely separate, module with nothing but A-position status present, for the mechanism of A-movement. Clearly, this is an absurd model of syntax.

Conversely, once we recognize that particular syntactic operations are radically restricted and selectively blind, then there is no longer any need to shunt phonological information, agreement features, or conjugation class features off to a different component of grammar. Whatever principle restricts head movement to seeing only head status and syntactic category will block it from seeing phonological information, agreement features, and conjugation class. Whatever restricts A-movement to seeing only A-position status will block it from seeing phonological information, count versus mass status, declension class, etc. We can instead have a model where all information is present from the beginning. Particular operations will be blind to all features except those that they target. I will state this important generalization as follows:

(3) The Narrow Focus of Syntactic Operations:
A syntactic operation that targets property X is blind to everything except property X.

In our example of head movement, head movement is an operation which targets heads of a particular syntactic category. Head movement is therefore blind to everything except head status and syntactic category. To take another example, wh-movement is a process that targets XPs with a [wh] feature. It is therefore blind to everything else.

Of course, an important research imperative will be to discover which features can be targeted by which types of operations, and why, but this will not be my focus here. What is important is that we can do without strict separation, and have all phonological and semantic features present from the beginning. Heads can be present with all their phonological and semantic content, but this content can never be referred to by head movement. XPs are present with all their phonological and semantic content, but most of this is invisible to the syntactic operation of wh-movement. And so on.

I should note that this view of syntax opens up the possibility that there could actually be syntactic processes that are sensitive to phonological properties. That is, most syntactic processes do not care about phonology, as they target only very specific syntactic properties like head status and syntactic category, but there could be some syntactic processes whose narrow target is phonological. Heavy shift, for instance, could target XPs over a particular threshold of phonological weight. This is a possibility that theories with strict separation would never allow. Once again, I will leave this unexplored here, as the focus is on morphology.

To summarize so far, there is no reason to strictly separate "purely syntactic" information from phonological information. Syntactic processes are very narrow in what they target, and ignore everything else, even other syntactic information. This means that we can have a much simpler model of grammar, where all information is represented together from the beginning. Consolidated Morphology therefore does without levels entirely: there is no D-Structure, no S-Structure, and in particular no Morphological Structure. Instead, I assume something closer to the architecture of Chomsky's (1993) Minimalist Program: the morphosyntax starts building complex objects through Merge, and finishes when all items have been Merged and all Agree operations have finished. Insertion of actual morphemes is interleaved with structure building,

in a way that will be made precise in section 3.3.2. There are no distinct levels, only successive steps of structure building.

2.3 Advantages to Rejecting Separation

A model with all information present and together has numerous advantages, including simplicity. In Distributed Morphology, the LF component is strictly separate from Morphological Structure, where Vocabulary Insertion takes place. However, actual semantic interpretation obviously depends on particular Vocabulary Items. This necessitates a later stage where semantic interpretation reunites the output of LF with the output of Morphological Structure. This later stage is rarely discussed and is never represented in diagrams of the Distributed Morphology model, but it is actually quite important (see Harley 2014, 230). This makes the Distributed Morphology model even more complicated than it appears to be (and that is already fairly complicated).

Distributed Morphology also has to divide actual lexical items among three different lists: the list of the feature bundles in the syntax; the list of phonological forms (Vocabulary Items); and the list of "encyclopedic" information, or semantic information. The first list is all that the syntax has access to, through the level of LF; phonological forms and encyclopedic information associated with roots only become available after vocabulary insertion on the PF branch. All of this complicated architecture can be done away with. We can get rid of all the levels, and we can also do away with a distinction between Vocabulary Items and "encyclopedic" information. We do need to distinguish features from actual morphemes that realize those features, but this is something that every modern approach to morphology recognizes (see, e.g., Stump 2001).

The architectural assumptions of Distributed Morphology have also led to numerous suboptimal analyses and even to clearly incorrect claims. Marantz (1997) concluded from the Distributed Morphology architecture that there could be no suppletion for lexical roots, a conclusion that is clearly false (e.g., Harley 2014). Reasoning from the same assumptions, Harley (2014) concluded that terminal nodes for lexical roots in the syntax have no content except for a numerical pointer, which points to the particular lexical root on the list of Vocabulary Items and the Encyclopedia. This is equivalent to having the lexical root present from the beginning, except that it adds an additional theoretical device, the numerical pointer. Similarly, Bobaljik (2012) posited a diacritic in the syntax that has the effect of producing synthetic comparatives with short adjectives (*prettier*) but analytic comparatives with long adjectives (*more beautiful*). In this case, the diacritic is a stand-in for phonological properties. What these diacritic analyses indicate is that we actually need an architecture where all semantic and phonological information is present from the beginning. (See section 4.2 for an analysis of comparatives.)

The architecture that I will assume has only a single level, the morphosyntax, as described above. The morphosyntax puts all complex objects together. There is no post-syntactic level of Morphological Structure, and there are no purely morphological operations. There is also only one list of stored items, which I will call (following tradition) the *lexicon*.

2.4 Storage of Full Syntactic Structures

An important consequence of this simpler architecture is that it clears the way to storage of full syntactic structures. This is impossible in the Distributed Morphology architecture: the three lists are only linked by the derivation, and there could be no fourth list that stores the output of a derivation, but which can then form the input to another derivation. In contrast, in an architecture where information is not encapsulated, stored items can include a syntactic structure with phonological and semantic information associated with it. There can be a stored item *transmission* that includes a syntactic structure *[[trans [mit]] ion]*, a phonological specification, and a semantics ('a car part'), and all of this can be merged into another derivation as

an N^0 (a complex one). Phrasal idioms like *kick the bucket* will be analogous, except that their syntax will include multiple X^0s and even XPs and their phonology will include multiple prosodic words. In Distributed Morphology, the 'car part' meaning of *transmission* has to be stored in one of the base morphemes (although it is not clear which one); in the architecture here, it is instead stored with the complex *transmission*. In Distributed Morphology, the 'die' meaning of *kick the bucket* has to be stored with one of the base morphemes, and again it is not clear which one (on this criticism of Distributed Morphology, see Williams 2007). In the architecture here, it is instead stored with a complex VP, *[$_{VP}$ kick bucket]*.[1]

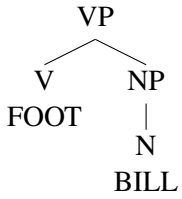
This model has a much diminished role for roots. In Distributed Morphology, all information about complex combinations has to be stored in the lexical entry of a root. That is not the case in Consolidated Morphology. The fact that the root *soc-* forms *social*, *society*, and so on is captured by storing all those (complex) forms. Roots that really have no content on their own, like *-ceive* and *-mit*, can be stored only as the specification that they have allomorphs *-cept* and *-miss*. They have little, if any, semantic content. It is instead the complex forms *perceive*, *receive*, and *permit*, *remit* that are stored with semantic content. *Perceptual* is also stored, once encountered, but **receptual* is not, since it will never be encountered (although the grammar would countenance its construction). Ditto for *remittance* versus **permittance*.

Storage of complex objects requires that complex objects can be merged into a derivation as a complex object. They can also be further modified once so merged, even in such a way that what is stored is altered. In other words, stored items are not atomic. For instance, the object of a verb-object idiom can be regularly modified or take different determiners, as in *taxpayers foot another travel bill*,[2] where the stored idiom is just *foot bill*. Relevant to morphology, the verb of a verb-object idiom can take different inflection, as in *(We all hope he) kicks the bucket soon* or *without kicking the bucket*.

Since the morphosyntax is what built the stored object in the first place, when the stored object is used in a derivation, it can be manipulated in all the ways the morphosyntax makes available. It is simply not the case that a stored item is an atomic element as far as the morphosyntax it is inserted into is concerned. I assume that stored items are underspecified, and can be inserted into larger structures if the individual morphemes match sub-parts of those larger structures and are compatible with them. How morphemes match terminal nodes in the syntax is spelled out in section 4. For discussion of phrasal idioms along the lines assumed here, see Kobele 2012.

To be concrete, I propose that a phrasal idiom like *foot bill* is stored as a partial syntactic structure:

(4)



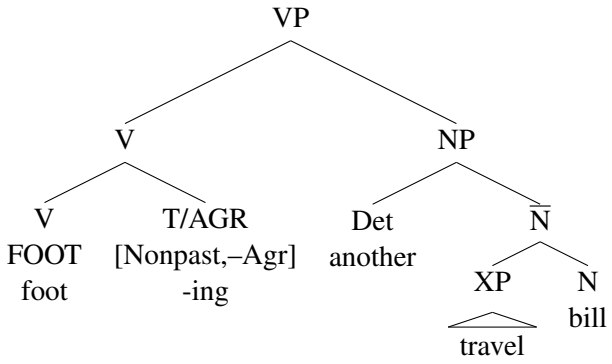
Capital letters indicate an abstract form, which will be spelled out as a concrete allomorph given the local context.

A stored partial structure like the above will be inserted into a derivation and merged with other elements, for instance determiners, a T/AGR node on the verb (see section 4.1), and modifiers. Abstract morphemes will receive concrete allomorphic specifications:

(5) (without) footing another travel bill

[1] Bruening, Dinh, and Kim (2016) show that determiners are never part of idioms.

[2] http://www.stuff.co.nz/national/health/4611271/Taxpayers-foot-another-travel-bill



I show details only for the verb. Further information on how this works will emerge as we proceed.[3]

2.5 Against Acategorial Roots with Categorizing Functional Heads

In Distributed Morphology, as just discussed, roots play a very important role. They are what is stored, and all information about contextual allomorphy and special meaning in different contexts has to be stored in the lexical entry of a root.

It is also common on current Distributed Morphology to hypothesize that roots themselves do not have syntactic categories. Instead, they obtain their categories in a syntactic context, by combining with functional heads like "little" v, n, a; see Marantz (2007), Embick and Marantz (2008), Embick (2010), among many others. These heads are also supposed to be important in delimiting domains for special meaning and (sometimes) special form. The idea is supposed to be that, once a categorizing head has attached to a root, elements that attach outside of that categorizing head cannot then trigger special forms or special meanings of the root. The form and meaning of the root is supposed to be fixed by the categorizing functional head.

I see little evidence for the view that all roots are acategorial, and little advantage to hypothesizing the uniform presence of categorizing functional heads. I therefore do without such categorizing heads entirely. Unless there is reason in a particular case to posit an acategorial root, I will assume that the smallest stem in most complex constructions has a syntactic category. In most of the cases discussed here this will make no difference, but that itself points to the lack of utility of v, a, n heads. Moreover, I strongly reject the hypothesis of Marantz (2007) that certain heads close off domains for special meanings and special forms. Idiosyncratic meaning can arise in complex structures of any size, as phrasal idioms like *count one's chickens before they hatch* make clear (since it includes a full finite CP). See especially Bruening (2014b, 411–412) and Bruening (2017c). Special forms can also go right through the posited categorizing heads, as for instance with past tense triggering a special stem form with English verbs like *sing-sang*. In a theory with a categorizing head v, that head intervenes between the root and past tense, and should block the special form. Embick (2010) has to add the proviso that categorizing heads that are not pronounced do not block the selection of special forms, but this just indicates that there is no reason to posit the head in the first place.

2.6 Words

As stated at the outset, in the model of grammar pursued here, there is no difference between phrases and words in how they are put together. In fact, I take it as established that there is no grammatically relevant

[3]Note that this approach to idioms could also be extended to sub-word modification, as an approach to what have been called "bracketing paradoxes" (e.g., Williams 1981, Spencer 1988). For instance, *hydro-* can attach to *electricity* to produce *hydroelectricity*, but in actuality it only modifies the *electric* part of *electricity*. One could analyze this as *hydro* being inserted into the stored item *electricity* in such a way that it only modifies *electric*. I will not explore this possibility further here, and leave the proper analysis of bracketing paradoxes to future research.

notion of "word" at all (see especially Haspelmath 2011). I assume that there are syntactic units (features, X^0s, XPs), and there are prosodic units (the elements of the prosodic hierarchy). There is no independent notion of a morphological or morphosyntactic word. Mapping principles relate syntactic structures to prosodic units. In many cases, X^0s will be mapped to a prosodic level commonly referred to as the Prosodic Word. However, this will not always be the case. Some Prosodic Words will include multiple X^0s that are not in a relation of dominance (e.g., cliticization, as in *shouldn't've*, which cannot undergo head movement as a single X^0; see section 4.1). It is also possible for a single complex X^0 to be mapped to multiple prosodic words (for instance, compounds with phrases as their first member).

In this view, what people intuitively mean by "word" is probably the Prosodic Word.[4] I will avoid use of the term "word" entirely, and instead speak of features, X^0s, and XPs as the syntactic units, and elements of the prosodic hierarchy as the phonological units. There are also morphemes, which match terminal X^0s in the syntax (see section 4), and features. No other units are countenanced in the model. As described above, stored items are not atomic, and can consist of multiple units of the types just described.

2.7 Summary of the Model

In Consolidated Morphology, there is only one level of grammar, the morphosyntax. There is only one list of stored items, the lexicon. Complex objects are stored in the lexicon with a structure, a phonological specification, and a semantics. Simplex items can also be stored, as simplex structures consisting only of an X^0 with phonological, semantic, and featural information (this is a *morpheme*). There is no strict separation of an abstract syntax from a phonologically-specified Morphological Structure. Instead, particular syntactic operations are very selective in what they pay attention to; basically, they ignore everything except the one particular property (or small set of properties) that they target. There is no notion of "word," instead there are syntactic units (features, X^0s, and XPs) and prosodic units. Complex structure are built up through a derivation by Merge, and morpheme insertion is interleaved with structure building, in a way that will be made precise in the next chapter.

[4] Non-linguists also often use the term "word" to refer to a stored entity corresponding to a single concept, even when that entity is more than one prosodic word, for instance phrases like *sugar daddy*. I take this as further evidence that there really is no linguistic category of "word," instead there are prosodic categories, syntactic categories, and stored items of all sizes.

Chapter 3

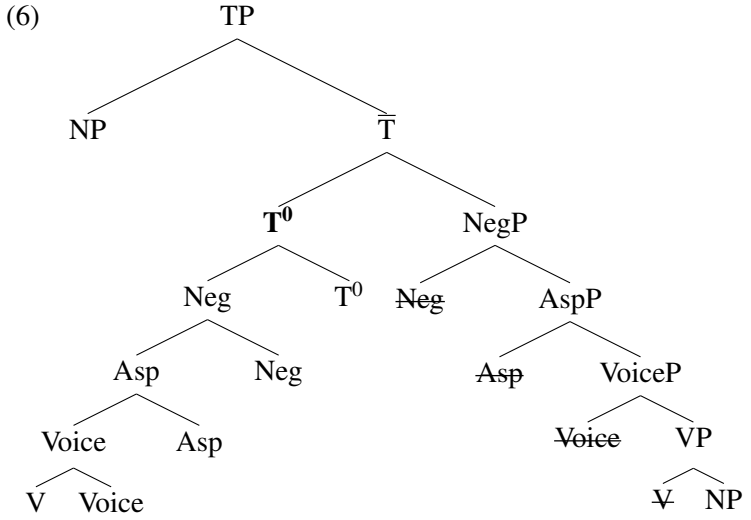
Mechanisms

Having established the broad architecture of the framework, in this section I outline the mechanisms I assume. I first argue that head movement is not involved in putting together complex morphological objects, and then outline an alternative.

3.1 Against Head Movement

Distributed Morphology and other syntactic theories of morphology typically make use of head movement in the syntax to assemble complex morphological objects (Baker 1988, Halle and Marantz 1993, Hale and Keyser 1993, among many others). For example, a complex verb might be assembled by moving V through Voice, Asp(ect), Neg(ation), and T(ense) projections (for a recent example of exactly this sort, see Merchant 2015 on Greek):

(6)



(Strikethrough indicates unpronounced lower copies of the heads that have moved.) The boldfaced T^0 is then a morphological word, consisting of morphemes realizing V, Voice, Asp, Neg, and T, in that order.

I argue that there is actually no connection between head movement in the syntax and the morphological composition of verbs and other complex heads. Where head movement is well-motivated in the syntax on the basis of position relative to other elements, it almost never has morphological consequences.

3.1.1 Verb Movement to C

Consider English. One of the best motivated instances of head movement is English T-to-C movement in inversion contexts (for a recent overview, see Bruening 2017b). It is clear that this instance of head movement has no effect whatsoever on morphology. Whether the auxiliary stays in T in English or moves to C, its inflection is the same:

(7) a. Bruno doesn't like goldfish.
b. Doesn't Bruno like goldfish?

(8) a. If she had done as we asked,...
b. Had she done as we asked,...

The same is true of verb-second in Germanic languages, also typically analyzed as head movement to C. The verb in verb-second Germanic languages moves to C in main clauses, but may not move at all in embedded clauses (at least in the mainland Scandinavian languages), yet main clause verbs and embedded clause verbs do not differ in their inflection:

(9) German
a. Gestern **sahen** die Kinder diesen Film.
yesterday saw the children this film
b. Er sagt, dass die Kinder diesen Film gestern **sahen**.
he says that the children this film yesterday saw

(10) Danish (Vikner 1995, 47, (33d, f))
a. Kaffe **drikker** Peter ofte om morgenen.
Coffee drinks Peter often in the.morning
b. Vi ved at Peter ofte **drikker** kaffe om morgenen.
we know that Peter often drinks coffee in the.morning

In Danish, the V does not move at all in embedded clauses, not even across negation or adverbs to T. This is true even with auxiliaries, as the following examples show:

(11) (Vikner 1995, 145, (31a,b))
a. Jeg spurgte hvorfor Peter ikke **havde** læst den.
I asked why Peter not had read it.
b. * Jeg spurgte hvorfor Peter **havde** ikke læst den.
I asked why Peter had not read it.

But again, the auxiliary is identical in its inflection to an auxiliary that moves all the way to C in a main clause. In particular, *havde* in (11a) is inflected for past tense, even though it has not moved to T (present tense is *har*). Note that Danish does not have *do*-support in the presence of negation, either, unlike English.

3.1.2 Verb Movement to T

V-to-T movement is usually claimed to have morphological consequences: it is what puts the tense and agreement inflection on the finite verb. However, this is also suspect, and on further reflection V-to-T movement can be seen to be completely irrelevant to inflection. As just shown, Danish verbs, including auxiliary verbs, never move to T in embedded clauses, but they are identical in their inflection to a verb that has moved through T to C in a verb-second clause.

Now consider English. In English, according to standard analyses, the auxiliary verbs *have* and *be* start to the right of negation, as can be seen when there is a modal:

(12) a. Carlotta may not **have** eaten the goldfish.
b. Drusilla may not **be** studying as hard as she should.

If there is no modal, then the auxiliary moves to the left of negation:

(13) a. Carlotta **has** not eaten the goldfish.
b. Drusilla **is** not studying as hard as she should.

In this case, there does seem to be a morphological consequence of this movement: *have* and *be* are in their base forms in (12), but are inflected for tense and agreement in (13). The standard analysis is that the auxiliary becomes inflected for tense and agreement by virtue of moving to an inflectional head, Infl or T(ense) (see, e.g., Lasnik 2000). An alternative, however, is that it is the *highest* verb that is inflected, regardless of its position. This can be seen to be the correct generalization once we look at main verbs, which never move anywhere. They never cross negation or adverbs, for instance, in contrast with French:

(14) a. John often **kisses** Mary.
b. Jean **embrasse** souvent Marie. (Pollock 1989, 367, (4b))

But the main verb bears finite tense and agreement if it is the highest verb, even though it has not moved to an inflectional head. This confirms that movement across negation in (13) is completely irrelevant for inflection. Auxiliaries also do not have to cross adverbs in English, and yet they will still be inflected if they are the highest verb:

(15) a. Holder said he often **has** seen officers take the stand sporting sunglasses.
b. While I was at the venue, Selby often **was** being whisked around town for radio and television appearances

Danish (above) makes the same point: the highest verb bears the tense inflection, whether it moves all the way to C in a main clause, or stays inside the VP and never moves to T in an embedded clause.

In other words, position and inflection are independent. This has been obscured in English because the highest auxiliary also obligatorily moves across negation in finite clauses. This has led researchers to the incorrect conclusion that there is a connection between this movement and inflection. As the above considerations indicate, there is not. Moreover, in non-finite clauses, the auxiliary *to* optionally moves across negation, with no morphological consequences whatsoever (on *to* being an auxiliary, see Pullum 1982):

(16) a. She hopes not **to** lose.
b. She hopes **to** not lose.

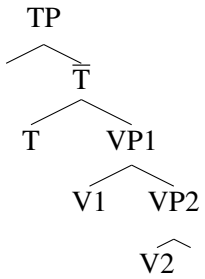
Verb movement across negation is independent of inflection. This is true both within English, and across languages: Within English, auxiliaries but not main verbs move to T, but both bear finite tense inflection if they are the highest verb. Across languages, in both French and Danish, the highest verb bears the finite inflection, but only in French does that verb cross negation. In Danish embedded clauses, the highest verb moves nowhere.

The generalization that the highest verb bears tense inflection regardless of its position is important, so it is worth highlighting here:

(17) Morphological Tense Generalization:
The highest verb is inflected for tense, regardless of its position.

This generalization appears to be true in a number of languages, including most Indo-European languages, but it is not limited to that family.

Let us assume that tense is a functional head T outside the VP, higher than the starting position of the highest verb, as follows:

(18)


The Morphological Tense Generalization can then be understood as T entering into an Agree relation (in the sense of Chomsky 2000) with a V within its complement. T Agrees with the highest verb and never with a lower verb because of locality: a closer verb is in the way. The operation of Agree is constrained to always involve the most local elements of the relevant type. In the tree above, T must Agree with V1 because it is the closest V in T's complement. Crucially, T Agrees with V1 in the structure above regardless of whether V1 moves. It may move to T, or it may move through T to C, or it may not move at all. Regardless, it will Agree with T, and bear finite tense.

If this is how inflection works, then the actual tense morpheme on the verb is not the head T. It must be something else. I will suggest below that it is a T/AGR head (for Tense and Agreement together) merged directly with V that must check its features against the clausal T head, through Agree. I will also generalize this analysis to all other instances of verbal inflection: all morphemes on the verb are heads that are merged directly with the V, which check their features against clausal heads.

I should also note at this point that Danish shows us that the standard analysis of *do*-support cannot be correct. In the standard analysis, the tense affix lowers from T onto a main verb in V if there is no auxiliary (Chomsky 1957; again see Lasnik 2000). Negation is supposed to block this lowering, leaving the affix stranded. Inserting *do* is then required to provide the affix with morphological support (again, see Lasnik 2000). In Danish, the verb never moves anywhere and is still inflected for tense, but negation does not trigger *do*-support:

(19) … at han ikke **købte** bogen.
that he not bought the.book (Platzack 1986, 209)

There therefore does not appear to be anything about negation that stops tense inflection from being realized on the main verb, and the standard account of *do*-support must be wrong. In fact, there is evidence even within English that *do*-support has nothing to do with morphology; as Bruening (2010) shows, the contexts for *do*-support all have certain properties in common, even when the conditions for *do*-support are not met. This means that these contexts have requirements that have nothing to do with the need for morphological support of a tense affix. Instead, the contexts that require *do*-support require the presence of an auxiliary. *Do* is used in order to meet this requirement. See more on this in section 4.1.6. Importantly, this requirement is completely independent of inflection, and can even hold in a non-finite clause (see Bruening 2010).

Note also that it has been claimed that there is a correlation between rich agreement inflection in a language and the presence in that language of verb movement to T. See Koeneman and Zeiljstra (2014) for a recent attempt to resuscitate this correlation, which has largely been discredited. The correlation does not seem to be real, see Bobaljik (2002) and Heycock and Sundquist (2017), as well as Harbour (2016). As Heycock and Sundquist (2017) show, Danish continued to exhibit verb movement to T for two centuries after

having lost agreement inflection on the verb. I conclude that there is simply no connection at all between inflection and verb movement.

3.1.3 Historical Change

The standard head movement account faces other, insurmountable difficulties from historical change. In particular, the loss of verb movement in the history of English as document by Haeberli and Ihsane (2016) is incompatible with standard analyses of verb movement to T. Haeberli and Ihsane (2016) show that verb movement across adverbs and verb movement across negation were lost separately and must therefore be two different movement processes. Importantly, the order in which they were lost is incompatible with standard analyses of verb movement to T, and leads those analyses into a paradox.

Briefly, the facts are the following: The loss of main verb movement across negation was a long process that started in the 16th century and came to completion over 200 years later. In contrast, the loss of main verb movement across adverbs started earlier, in the middle of the 15th century, and was largely completed by the middle of the 16th century, when main verbs were still moving across negation.

This historical development is very strange from the perspective on verb movement in the standard account, represented by Pollock (1989). In that account, verb movement takes place in two steps: the first step moves a verb across adverbs, and the second step moves verbs across negation. The second step is not possible without the first. If the first step is lost, as appears to have happened given the data in Haeberli and Ihsane (2016), then the second step should not still be possible. Yet apparently it was in the history of English. Haeberli and Ihsane (2016) propose to reverse the two movement steps, with the first step being across negation and the second being across adverbs. Then the second step can be lost while the first step still takes place. This is incompatible with the facts of French given in Pollock (1989), and would therefore require cross-linguistic variation in the order of the two steps, and the placement of adverbs and negation within the clause. It is also incompatible with facts of Modern English, where adverbs can and often do follow negation:

(20) a. The students will not always be told what the answer is.
b. If landlords have not quickly fixed an issue with the apartment. . .

This is one reason the standard account has the ordering it does: the auxiliaries *will* and *have* must have crossed *always* and *quickly* first, and then moved across negation. In fact, adverbs can come on both sides of negation:

(21) The students will probably not always be told what the answer is. (Baker 1991, 395–396, (17))

The account in Haeberli and Ihsane (2016) would then have to posit yet more changes in the history of English, so that there are now three movement steps: the first across some adverbs, the second across negation, and the third across yet more adverbs. In the 15th and 16th centuries (and later), the possibility of adverbs coming lower than negation would have had to be absent.

In contrast, the historical facts are expected on the account of verb movement in Baker (1991) and Bruening (2010). In that account, there are two distinct rules. One is a rule that obligatorily moves verbs across negation. In Modern English this only affects auxiliary verbs and not main verbs. In earlier forms of English it was not so restricted; the historical development included the rule becoming restricted to auxiliaries. This restriction took hold over 200 years starting in the middle of the 16th century, as described above.

The second rule is a rule that moves verbs across adverbs. This rule is optional and is related to stress. In Baker (1991), the rule is obligatory for unstressed auxiliaries, while stressed auxiliaries may not undergo it. This appears to have been factually incorrect, and in Bruening (2010) the rule is simply optional. Regardless,

in Modern English this rule is restricted to auxiliaries, just like the negation rule. Main verbs may not move across adverbs. However, in the past this restriction did not hold, and again the historical development includes the rule becoming limited to auxiliaries. Importantly, however, the adverb rule is distinct from the rule moving a verb across negation. The two rules are separate rules, with neither depending on the other (unless an adverb happens to follow negation, as in (20a–21), then the obligatory negation rule forces the otherwise optional adverb rule to apply). It is therefore expected that historical change could affect them differently. In particular, the rule moving verbs across adverbs becomes restricted to auxiliaries *before* the rule moving verbs across negation. In fact, the change to the adverb rule is largely complete before the change to the negation rule even begins. (One could imagine that the change to the adverb rule is one of the triggers for the change to the negation rule.)

Crucially, unlike in the standard account, the two movement rules are completely unrelated to inflection. Movement across negation has nothing to do with the morphology of the verb. Neither does movement across an adverb. One is obligatory, the other is optional; whether the optional rule applies or not, the auxiliary is still inflected the same. The same was true of periods where main verbs could optionally undergo movement: whether they moved or not, they were still inflected. The facts of language change in the history of English support this type of account, and therefore support the view where verb movement has nothing to do with inflection. The facts are incompatible with the standard account, where V movement to T is a two-step process and must take place in order for inflection to appear on the verb.

Some varieties of Mainland Scandinavian have also been found to allow verb movement over adverbs even when they do not allow verb movement over negation. See Bentzen 2007 and Heycock, Sorace, and Hansen 2010. This is true even when some of the adverbs that the verb can move over preferentially precede negation when they co-occur. This is a paradox in the standard account, but makes perfect sense in the two-rule account.

3.1.4 Polysynthetic Languages

The head movement account of morphological composition also implies that languages with very complex verbs (as in polysynthetic languages) should have head movement to a very high position, in order to get all of the morphemes on the verb. This is in fact Halle and Marantz's (1993) analysis of the Algonquian language Potawatomi. Potawatomi has very complex verbs like the following, with various agreement morphemes, negation, and tense ("Preterit"):

(22) k-wapm-a-s'i-m-wapunin-uk
2-see-3Acc-Neg-2Pl-Preterit-3Pl
'you (pl) didn't see them' (Halle and Marantz 1993, 140, (16b))

Halle and Marantz (1993) propose that the verb moves through a head they call Ind(ependent), through Neg and T to C. The prefix *k-* is, according to them, a pronominal argument cliticized to C.

The problem is that other polysynthetic languages clearly do not have verb movement to such a high position, as diagnosed by word order. In the closely related Passamaquoddy-Maliseet, for instance, the verb could not be in C. Passamaquoddy-Maliseet is a wh-movement language, with wh-words moving to Spec-CP. If the verb were in C, then a fronted wh-phrase and the verb should always be adjacent. However, numerous things can and even must come in between them. Negation in the form of a freestanding particle must come in between them. XPs (other arguments, for instance), can come in between the wh-phrase and the verb, on either side of negation:[1]

[1]The transcription uses the orthography in use in the Passamaquoddy community. Letters have their usual values except that o = schwa, q = [k^{w}], c = alveopalatal affricate, ' = initial *h* (phonetic effect is aspiration of the following stop or devoicing of *s*). Obstruents are voiced in many environments. Abbreviations: 1 = first person; 2 = second person; 12 = first person plural inclusive;

(23) *Wh-phrase XP Neg XP verb*

a. Tama ma=te wen wikuwaci-toli-hpi-w?
where Neg=Emph someone enjoy-there-eat.3-Neg
'Where does no one like to eat?' (Bruening 2001, 148, (347b))

b. Kat=op keq kt-ol-essi-w.
Neg=would something 2-thus-happen.to-Neg
'Nothing shall happen to you.' (Mitchell 1921/1976a, 11)

The verb could not even be moving as high as Neg, then. It has definitely not moved to C. Yet the verb still bears a negative affix and may have tense and mood morphemes, just like Potawatomi:

(24) '-tokom-a-wi-wa-s-opon-il
3-hit-Dir-Neg-3P-Dubitative-Preterit-Obv
'they (proximate) may have hit him/her (obviative)'

It is also clear in Passamaquoddy-Maliseet that the prefix is not a pronoun and is not in C. It obligatorily doubles a freestanding pronoun, making it agreement. Such a freestanding pronoun can, like all XPs, come in between a wh-phrase and the verb:

(25) Tama nil nt-i?
where 1 1-be.located
'Where am I?' (Newell 1974, 2)

The freestanding pronoun is therefore not left-dislocated, since left-dislocated elements must precede wh-phrases (Bruening 2001). It must be the argument of the verb, and the prefix must be agreement. Moreover, given the word order, the verb could not be in C.

Thus, the most superficial inspection of word order reveals that the verb in Passamaquoddy-Maliseet is quite low, below negation. But it is also morphologically complex. We must conclude that complex morphology is not put together through head movement to a high functional head.

3.1.5 English Comparatives and Superlatives

Other cases where researchers have proposed head movement to explain morphological facts have turned out to be problematic. For instance, it is commonly proposed that English comparatives and superlatives are put together by moving an A(djective) to a Deg(ree) head, which combines the A with the suffix *-er* or *-est*. If this movement does not happen, then Deg is realized as *more* or *most*, and there is no suffix on the A (e.g., Corver 1997, Matushansky 2013):

(26) a. smarter, smartest
b. more intelligent, most intelligent

Movement of A to Deg can also be realized as suppletion, as in *bad—worse, worst*.

Matushansky (2013) defends the head movement account of these morphological forms on the basis of the claim that we need further head movement to a V head in order to explain why change of state verbs are always built on the suppletive comparative form if there is one (Bobaljik 2012). For instance, there is a verb *to worsen* in English, which seems to consist of the root BAD, the suppletion that is triggered by Deg, and

3 = third person animate proximate or unmarked; Conj = conjunct inflection; Dir = direct voice; Dub = dubitative; Emph = emphatic particle; Fut = future; IC = initial change (ablaut); Inan = inanimate; Inv = inverse voice; Loc = locative; N = morpheme glossed "N," described in the text; Neg = negative; Obv = obviative; P = plural; Pret = preterite.

a V head *-en*. According to Matushansky, this could only be put together by movement of A through Deg to V. The problem is that we then expect verbs based on non-suppletive adjectives to include the *-er* suffix, since they should also have moved to Deg. They never do, however:

(27) a. to smarten (up), *smarteren
b. to widen, *wideren
c. to enlarge, *enlarger

This discrepancy severely undermines the head movement account of the morphological composition of comparative adjectives and deadjectival verbs. For other arguments against head movement accounts, see Embick and Noyer (2001), Embick (2007), Embick and Marantz (2008). An alternative analysis is provided in section 4.2.

3.1.6 Definiteness Marking in Danish

Another case that was initially analyzed as morphological composition through head movement has also been shown to be problematic. This is definiteness marking in Danish. Definiteness is marked by a suffix on the head noun when it is not modified, but by a freestanding article when there is a prenominal adjective:

(28) Danish (Hankamer and Mikkelsen 2005, 87–88, (3a), (6c))
a. hest-en
horse-Def
'the horse'
b. den gamle hest
Def old horse
'the old horse'

Embick and Noyer (2001) analyze this as movement of N to D, which is blocked by a prenominal modifier. However, Hankamer and Mikkelsen (2005) show that this analysis suffers from numerous problems. One problem, which Embick and Noyer (2001) do provide an analysis of but which makes an important general point for this paper, is that in the closely related Swedish, there can be a freestanding definite article *and* a suffix on the head noun at the same time:

(29) den gamla mus-en (Swedish)
Def old mouse-Def
'the old mouse' (Hankamer and Mikkelsen 2005, 88, (5b))

This is incompatible with a simple head movement analysis of the type that is typically proposed, where there is one single head that is realized as an affix if there is head movement and a freestanding element if there is not. In fact, doubling of this sort is widespread. It even exists in English comparatives. It is viewed as substandard, but it is in fact common, as for instance *more stupider, more better*. Bobaljik (2012) shows that this doubling is common in comparatives cross-linguistically. Children acquiring Standard English use doubling in comparatives. This should never be possible if both *more/most* and *-er* are manifestations of the same, single Deg head.

3.1.7 Other Cases of Doubling

Doubling is also common with other elements, for instance negation. In Passamaquoddy-Maliseet, negation is realized obligatorily by both a preverbal particle and a morpheme on the verb:

(30) **Kat**=op keq kt-ol-essi-**w**.
Neg=would something 2-thus-happen.to-Neg
'Nothing shall happen to you.' (Mitchell 1921/1976a, 11)

In fact it is extremely common for negation to be realized by multiple markers in a clause, so common that head movement analyses typically posit both a head and a specifier in order to accommodate two negative elements (e.g., Pollock 1989). This is not straightforwardly compatible with the word order in (30): if the suffix is the head Neg, the verb must have moved as high as Neg. But then it would have to be adjacent to the preverbal particle *kat*, assuming that it is the specifier of Neg. It is not so adjacent, and numerous phrases and particles can separate them. Other analyses of negation posit multiple NegPs in the clause (e.g., Zanuttini 1997), but we will also see numerous examples of doubling in domains other than negation, which would then require multiple projections of every syntactic category. This seriously undermines the appeal of head movement analyses. I take doubling of this sort to indicate that head movement is not the right approach to morphological composition.

Note at this point that doubling is expected on the agreement view of inflection adopted here. Recall that I proposed above that there is a clausal T head, and there is a head merged with V with tense features that it must check through Agree with T. This type of analysis fully expects that the clausal T head and the morpheme on the verb could both be spelled out. In the domain of negation, there can be a clausal head Neg, which in in Passamaquoddy-Maliseet is realized as the preverbal particle, and a negative morpheme on the verb that Agrees with it. This agreement relation does not require movement, so the clausal Neg head can be separated from the verb bearing the Neg morpheme by multiple elements in the syntax.

3.1.8 More on Negation

In languages that have a negative morpheme on the verb, the negative morpheme is often in the wrong place for sentential negation. For instance, in Potawatomi and Passamaquoddy-Maliseet, the negative morpheme on the verb is quite close to the stem, as was shown above. The example from Passamaquoddy-Maliseet is repeated below. As can be seen, the negative morpheme is closer to the stem than the Dubitative and the Preterite morphemes, which presumably realize modal and tense categories:

(31) '-tokom-a-**wi**-wa-s-opon-il
3-hit-Dir-Neg-3P-Dubitative-Preterit-Obv
'they (proximate) may have hit him/her (obviative)'

However, the freestanding negative particle is always preverbal and therefore farther away from (and presumably higher than) the verb and any prefixal tense, aspect, or mood morphemes (the preverb *koti-* can be translated either as 'want' or as a future marker):

(32) (Bruening 2001, 97, (199b); 92, (179a))

a. **Ma**=te n-**koti**-nomiy-a-wi-k kehceyawi-c-ik weyossis-ok.
Neg 1-want-see-Dir-Neg-3P IC.be.many-3Conj-Part3P animal-3P
'I don't want to see a lot of animals.'

b. **Ma**=te wen '-**kisi**-tomh-a-wiy-il Piyel-ol.
Neg=Emph someone 3-Perf-beat-Dir-Neg-Obv P.-Obv
'No one beat Peter.'

The freestanding particle case is where we might expect negation to be: higher than tense, mood, and aspect, where it can negate a proposition. In contrast, the negative morpheme on the verb is in a completely

unexpected place, close to the verb stem, and below tense, mood, and aspect. Other languages also have negation close to the verb stem: in Turkish and Nanai, for instance, the negative morpheme comes closer to the stem than tense (Payne 1985). Such a low placement makes it doubtful that the negative morpheme on the verb is the head Neg in the clause that is responsible for sentential negation, as it is taken to be in standard head movement analyses.

3.1.9 Summary: No Relation between Head Movement and Morphology

All of the above considerations indicate that there is really no relation between head movement in the syntax and morphology. Where head movement is motivated on the basis of relative order, it never has morphological consequences. The inflection on the verb is also completely independent of verb movement within the clause. Other putative cases of head movement putting together complex morphological objects, like English comparatives, have turned out to be problematic. There are also numerous cases of doubling, where some category is marked both as a morpheme on some other element, and as a freestanding element of some kind. This provides additional motivation for the view that clausal heads and morphemes on the verb are distinct, but Agree with each other in order to check features.

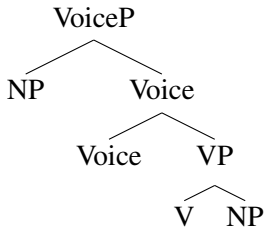
3.2 Morphemes on V are not Clausal Heads

The previous section argued that complex morphological objects, verbs in particular, are not put together through head movement. This section argues furthermore that the clausal heads that researchers motivate through various empirical arguments turn out not to correspond to morphemes that we see on the verb, and vice versa. We have already seen that this is likely for negative markers on the verb in languages like Passamaquoddy-Maliseet. In this section, I will make the same point for the commonly posited clausal heads v, Voice, Pass, and T, as well as a reciprocal morpheme on the verb in Passamaquoddy-Maliseet.

3.2.1 Voice in Passamaquoddy-Maliseet

Kratzer (1996) proposes that external arguments are introduced by a functional head Voice that takes the VP as its complement:

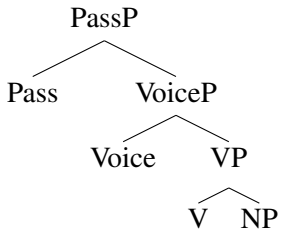
(33)



In languages like English and German Voice is not typically realized morphologically, but it is said to be in some other languages (e.g., Greek in Merchant 2015).

Bruening (2013) adopts Kratzer's Voice and adds a head Pass(ive) for passive clauses. This head takes an unsaturated projection of Voice as its complement (and existentially quantifies over the unprojected external argument):

(34)



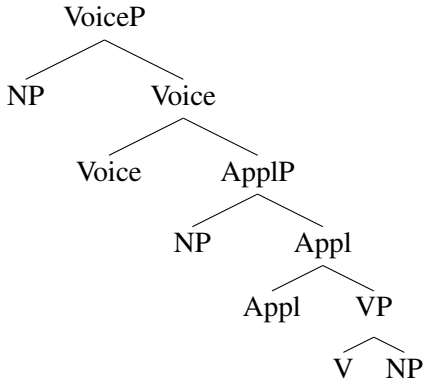
This will become relevant below, for now the discussion will center on the head Voice.

An argument for separating the external argument from the VP is that additional arguments can be added in between the external argument and the internal argument. For instance, *applicative* arguments like benefactives and external possessors are common in the world's languages. They are both illustrated for Passamaquoddy-Maliseet below:

(35) On oc n-ikuwoss n-moteht-ehm-**uw**-a-n possiyantesk-ik,
then Fut 1-mother 1-knock-TransInan-**Appl**-Dir-N window-Loc
nt-apqote-m-**a**-ku-n.
1-open-TransInan-**Appl**-Inv-N
'. . . I knocked at my mother's window, and she [opened it for me].' (Newell 1979, 23)

In Passamaquoddy-Maliseet, an applicative suffix with allomorphs *-uw-* and *-a-* (the latter appears before the inverse morpheme) is added to a verb stem to add an additional argument. In this example, with the verb 'knock', the additional argument is interpreted as the possessor of the internal argument, and with the verb 'open', it is a benefactive. Importantly, all tests for hierarchy put the additional argument higher than the internal argument of the verb but lower than the external argument of the verb (see Bruening 2001). This requires that the two arguments not be arguments of the same head, as they can be separated by an additional head and its argument. Supposing for the moment that the applicative suffix is an Appl(icative) head which projects the additional argument in its specifier (Marantz 1993, Pylkkänen 2008), we are led to the following structure:

(36)



If the external argument were an argument of the verb rather than of Voice, it would be impossible to add an applicative argument between the external argument and the internal argument (through syntactic means). (See Harley 2013 for this argument in Hiaki.)

Now consider the morphemes in Passamaquoddy-Maliseet that are usually referred to as *finals*. These come in four varieties, and determine argument-taking properties of the verb stem. For instance, the verb meaning 'dry' occurs with four different finals, as follows (the *kis-* prefix is a perfective marker, this particular stem generally does not occur without some such prefix):

(37) a. (kis)-pa-**hsu** 'dry', intransitive with animate subject

b. (kis)-pa-**hte** ‘dry’, intransitive with inanimate subject

c. (kis)-pa-**hsim**- ‘dry’, transitive with animate object

d. (kis)-pa-**hsom**- ‘dry’, transitive with inanimate object

The finals mark whether the verb is transitive or intransitive, and they mark the animacy of one of its arguments. If the verb is intransitive, they mark the animacy of the subject. If the verb is transitive, they mark the animacy of the object.

It would be quite natural to analyze these finals as Kratzer’s Voice head. Voice is supposed to simultaneously project the external argument and case-license the internal argument (Kratzer 1996). We could then say that Voice is realized as a transitive final if it projects a specifier and case-licenses an object, otherwise it is intransitive; and it agrees in animacy with the case-licensed object if there is one, otherwise it agrees with the subject.

Unfortunately, this nice neat analysis runs into problems immediately. For one thing, the applicative morpheme attaches outside of the final:

(38) On oc n-ikuwoss n-moteht-**ehm**-**uw**-a-n possiyantesk-ik,
then Fut 1-mother 1-knock-**TransInan**-**Appl**-Dir-N window-Loc
nt-apqote-**m**-**a**-ku-n.
1-open-**TransInan**-**Appl**-Inv-N
‘. . . I knocked at my mother’s window, and she [opened it for me].’ (Newell 1979, 23)

But given hierarchical relations, the applicative morpheme should come in between the verb stem and the Voice head, as in (36). The morphemes are in the wrong order, given the syntax.

A second problem comes from the reciprocal. In Passamaquoddy-Maliseet, reciprocals are formed with a suffix on the verb. This suffix detransitivizes the verb. An example follows:

(39) Nit te na ’-kotun-**ol**-**oti**-ni-ya.
then Emph also 3-hunt-**TransAn**-**Recip**-N-3P
‘So they go after each other.’ (Francis and Leavitt 1995, line 68)

Importantly, a reciprocal verb is intransitive in every way. The agreement morphology is that of an intransitive, and syntactic phenomena like obviation treat it as an intransitive. This means that one of the arguments of the base transitive stem has been suppressed, and not projected at all in the syntax. Bruening (2004, 2006b) analyzes reciprocal verbs as suppression of the internal argument, so that the underlying object is never projected in the syntax. The issue for the analysis of the finals as Voice is that the reciprocal morpheme always attaches to a Transitive Animate final, as can be seen in (39) (the corresponding Animate Intransitive is *kotun-ke*, ‘hunt’, intransitive). That is, the final, which is supposed to be Voice, is indicating that Voice has projected an external argument and case-licensed an internal argument, but it has not.

These problems make it difficult to analyze the finals as Voice. If the verb stem is V, and the finals are not Voice, then it is not at all clear what clausal head they correspond to, and it is also not clear what morpheme corresponds to the clausal head Voice.

3.2.2 The Passive in Passamaquoddy-Maliseet

A similar issue arises with the passive in Passamaquoddy-Maliseet.[2] The passive, like the reciprocal, completely suppresses one of the arguments, this time the external argument. The external argument cannot be

[2]The Algonquian literature refers to the passive as an “indefinite subject” form rather than a passive, but that is only because it is not clear whether it involves object promotion, and it also seems to be marked by inflection rather than a valence-changing process. However, it has the essential characteristic of a passive, namely the external argument is not projected and is interpreted existentially. Therefore it should be viewed as a passive (see Bruening 2013 and Bruening and Tran 2015).

realized, not even as an oblique (a by-phrase). Again, the verb is treated by the syntax as an intransitive (in obviation patterns, for instance). Again, however, the passive attaches to a Transitive Animate final:

(40) Ipa, wot pesq psk-**uw**-**a**.
well, Dem one find-**TransAn**-**3.Pass**
'Just one of them was found.' (Newell 1979, 20)

This is puzzling, if the finals are Voice. Voice has not projected an external argument, and so it should not be spelled out as transitive.

Also puzzling is the fact that the passive is marked in inflectional slots that are used for other purposes elsewhere, not through derivational morphology like the verbal reciprocal. With transitive animate base verbs, the passive is marked on a morpheme known as the *theme sign*, which immediately follows the final. This can be seen in (40) and in the following example with first person, which takes a different allomorph of the theme sign:

(41) ma te nt-ok-**om**-**oke**-w
Neg Emph 1-hit-**TransAn**-**Pass**-Neg
'I am not hit'

With third persons in (40), the theme sign is the same form as the direct voice, but the inflection for an additional argument is missing (the prefix, and an obviative agreement marker). In (41), there is a special allomorph of the theme sign just for the passive with first and second person logical internal arguments. In other words, the passive is not marked by valence-changing morphology, but is marked by inflectional categories that play other roles elsewhere. The passive inflection is like the reciprocal morpheme in that it comes outside a final indicating a transitive verb with an animate object, even though the verb is not transitive.

Moreover, the morphology indicating the passive comes before negation with transitive animate verbs (41), but *after* negation with passives of other verbs (42–43):

(42) ma te op-**i**-w-**one**-hpon (ma te op-i-wi-hpon)
Neg Emph sit-**IntransAn**-Neg-**Pass**-Pret (Neg Emph sit-IntransAn-Neg-Pret)
'there was not sitting' ('he did not sit')

(43) ma te pun-**omu**-w-**one**-hpon (ma te '-pun-omu-w-on-ihpon)
Neg Emph put-**TransInan**-Neg-**Pass**-Pret (Neg Emph 3-put-TransInan-Neg-N-Pret)
'it was not put (there)' ('he/she did not put it (there)')

This is a real problem for the view that the finals are Voice, because if they were, Pass would be unable to suppress Voice's argument across an intervening Neg head.

I conclude that the finals are not Voice. This means that Voice, which we have motivated through non-morphological arguments, has no realization. Additionally, the Pass head that effects the passive does not correspond to one single morpheme. The morphemes used to indicate the passive independently exist, and mark other things in the active. They also do not occupy a consistent position in the verb. This means that Pass, the head that Bruening (2013) posited to effect passivization, also has no realization. It is only marked indirectly, through its effect on other morphemes.

The same is true of the English passive. The English passive is marked by two morphemes, the BE auxiliary and the passive participle suffix on the verb. But neither one of these by itself could be the Pass head. It is possible to have a passive without the BE auxiliary, in a reduced relative clause:

(44) a. Anything eaten on the premises is at your own risk.

b. People shown disturbing images often pass out.

BE could therefore not be Pass. But *-en*, the passive-participle-forming suffix, also could not be Pass, because it can also occur in active clauses:

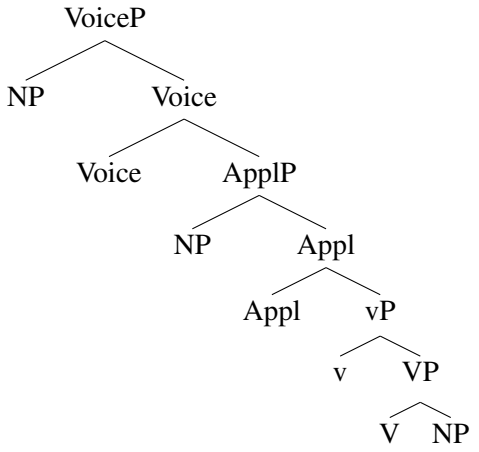
(45) a. We have not eaten dinner yet.
b. We have never shown anyone disturbing images.

What such facts show us is that verbal morphology does not correspond directly to clausal heads, the way that it should in head movement analyses. Clausal heads can be marked indirectly, or not marked at all, or they can be marked in different positions in different circumstances, or even through the combination of multiple morphemes.

3.2.3 Another Head, v?

Harley (2013) argues that we need an additional head, v, in between VP and Voice. If there is an ApplP, it comes above vP:

(46)



One could then suggest that the finals in Passamaquoddy-Maliseet are v, not Voice. This would explain their position relative to the applicative head, since v comes between V and Appl in (46). This suggestion would not help to explain other facts, however: It is not clear how the finals, as v, could encode transitivity, since v does not enter into any relation with both the external argument and the internal argument. It is also not clear how the finals would agree with Spec-VoiceP to mark the animacy of the external argument in an intransitive. This would require that a head be able to agree with some XP that it does not m-command, something that is generally ruled out. In addition, under this analysis, Voice would still have no particular realization, and Pass would still appear in two different locations. In other words, all of the puzzling facts still remain.

3.2.4 What the Finals Actually Do

I suggest instead that the finals encode selectional properties. They take a transitive form if both Voice and V select an NP. They mark animacy on the basis of what the verb or Voice imposes a selectional restriction on. V's selectional restriction is marked preferentially over that of Voice, so that Voice's selectional restriction is only marked if V selects no argument. The finals are not affected by detransitivization processes because these processes merely block a selected argument from being projected in the syntax, they do not change the

selectional properties of the heads. That is, both reciprocal verbs and passives are still logically transitive and imply both an external and an internal argument. One of them is just not syntactically present.

An analysis of the morphemes on the verb in Passamaquoddy-Maliseet is provided in section 4.5. Importantly, these morphemes do not correspond in a one-to-one fashion to clausal heads.

3.2.5 The Reciprocal in Passamaquoddy-Maliseet

Let me now return to the reciprocal in Passamaquoddy-Maliseet. The reciprocal is very productive, very regular, and is marked by a single, easily identifiable morpheme. In a head movement type of analysis, this seems like the ideal candidate for a clausal head that gets added to the verb by head movement. In fact this is how Bruening (2004, 2006b) analyzes it. In this type of analysis, the morpheme on the verb *is* the clausal head that performs the syntactic and semantic functions of the reciprocal. Unfortunately, things are not that simple, even with something that looks simple on the surface. As Bruening (2006b) shows, it is possible to get long-distance scope with the reciprocal (see also Dalrymple, Mchombo, and Peters 1994 on Chichewa):

(47) Piyel naka Susehp toqi=te litahasuw-ok kisi-tomh-**utu**-wok.
Peter and Joseph both=Emph think-3P Perf-defeat-**Recip**-3P
'Peter and Joseph both think that they defeated each other.'

a. Peter and Joseph both think: Peter defeated Joseph and Joseph defeated Peter.

b. Peter thinks Peter defeated Joseph and Joseph thinks Joseph defeated Peter.

The long-distance scope reading in (47b) requires some type of quantificational element in addition to the reciprocal morpheme, for instance a distributive operator that can move across clause boundaries as in Heim, Lasnik, and May (1991). Bruening (2006b) in fact decomposes the reciprocal in Passamaquoddy-Maliseet into two pieces, only one of which is the actual morpheme on the verb. Regardless of the actual analysis, the morpheme on the verb cannot be the only thing that is doing the syntactic and semantic work of the reciprocal, given long-distance scope.

The lesson from such facts is that actual morphemes do not neatly correspond to the syntactic and semantic operators that we need to do the syntactic and semantic work of the categories that the morphemes mark. Conversely, the syntactic and semantic operators that we need (like Voice and Pass) do not correspond to actual morphemes, and are often not realized at all.

3.2.6 One Morpheme, Multiple Functions

The Passamaquoddy-Maliseet reciprocal actually seems to be unusual in marking only one category. More common is a situation where a single morpheme seems to have many different functions, or marks many different categories. For instance, Passamaquoddy-Maliseet also has a reflexive morpheme (48a), but this morpheme is not dedicated to the reflexive. It also marks passives or "medio-passives" (48b–c)[3] and it also appears as a lexical part of many psychological verbs (48d):

(48) a. (')-Macaha-n kcihku-k (')-naci-nehp-uh-**usi**-n.
3-leave-N forest-Loc 3-go.do-kill-TransAn-Refl-N
'He goes away into the woods to kill himself.' (Mitchell 1921/1976b, line 117)

b. It-**asu**, neke Koluskap nekola-t skicinu, wapi kuhkukhahs
say-**Pass**.3 then.Past K. IC.leave-3Conj Indian.ObvP white owl
oloqiye-ss etoli-mocimkahqihke-k.
leave.3-DubPret IC.where-be.thick.trees-IIConj

[3]Thus, there is yet another way passives can be marked in Passamaquoddy-Maliseet. There are three different morpheme "slots" that can realize the passive.

'It is said that when Koluskap left the Indians, the white owl went into the thick woods.' (Mitchell 1921/1976b, 9)

c. Mec=ote ona iyu wahkehsu siki-motewolon kosona assok-apiyi-t skitap
still=Emph also be.3 few hard-motewolon or strange-have.power-3Conj person
keciciht-aq tan oli-pecipt-**asu**.
IC.know.TI-3Conj WH thus-bring-**Pass**.3
'There are now only a few fearsome *motewolons* or men with unusual powers who know how it is produced.' (Mitchell 1921/1976b, 16–17)

d. Msiw skicin nuto-k akonutomakon, msiw wolitah-**asu**.
all Indian hear-3Conj report all be.happy-**Refl**.3
'Every Indian who heard the news, every one was happy.' (Leavitt and Francis 1990, 53)

Examples such as this are extremely common (especially with reflexives and passives, see e.g. Baker 1996). Once again, this indicates that these morphemes do not correspond to particular clausal heads. I suggest that they are instead *markers*: They mark that one or more of a certain set of syntactic operators are present and operative. This fits neatly into the idea of morphemes on the verb agreeing with a clausal head: a single morpheme can be capable of agreeing with more than one type of clausal head.

3.2.7 Past Tense in English

Even a clausal head like English T(ense) that seems to be straightforward and to have a single morphological realization turns out not to be so straightforward. English T is generally considered to be realized as either the third person singular *-s* in a non-past environment or as an allomorph of the *-ed* ending in the simple past tense, or else it is null. Let us focus on the simple past tense. In the traditional analysis (Chomsky 1957), the highest auxiliary moves to T and thereby comes to bear the *-ed* ending. If there is no auxiliary, *-ed* lowers onto the main verb. The issue here is that the combination of the auxiliary *have* plus the past participle of the next lower verb can also be a realization of the simple past tense, in non-finite environments. Consider the following:

(49) a. In order to have played on the high school basketball team, you would have had to have been tall.

b. I should have been tall.

A predicate like *be tall* cannot generally appear in the perfect in a finite environment:

(50) # I have been tall.

This means that in the non-finite environments in (49), what looks like the perfect is not actually the perfect. It is the simple past. With predicates that allow both, it is ambiguous:

(51) You would have had to have been sick.

This sentence allows the range of meanings of the perfect (experiential, or ongoing at the reference time), but also allows the meaning of the simple past: at a certain point in (counterfactual) time, the subject was sick.

This means that the simple past tense can be realized either as a single affix, or it can be distributed across an auxiliary plus participle form. This is unexpected on the traditional head movement account. What it indicates is that if there is a clausal head T that selects syntactically and has a semantic function, its exact realization can vary, and that realization does not have to be at the location of the clausal head itself.

It can be realized elsewhere. Recognizing that a single clausal head can have multiple realizations, and that the realization of the head can occur elsewhere in the clause, obviates the need for both head movement and affix lowering. Descriptively, we can say that finite past-tense T requires an *-ed* affix on the highest verb; this will be formalized as an Agree relation. Non-finite past-tense T instead selects the *have* auxiliary as its complement (in its bare form, because T is non-finite), which then requires a past participle form on its complement, through Agree. (An analysis of the English verbal system is spelled out in section 4.1.)

3.2.8 Summary: Clausal Heads are Clausal Heads, Morphemes on Verbs are Markers

Various clausal heads have been motivated in the past literature on the basis of syntactic, not morphological facts. We need a head C that hosts complementizers and finite verbs in some environments. We need a lower head, call it T, that verbs may move to in some environments in some languages. I will assume that this head is the locus of the semantics of tense. We also need a head Voice, and probably a Pass head (although it is also possible that Pass could be just a different variety of Voice rather than a separate head). There are probably also Asp(ect) heads of different varieties, and Mod(al) heads.

The morphemes that appear on verbs in many languages are *not* these heads. Instead, they should be thought of as *markers*. By virtue of agreeing with clausal heads, they indicate that those heads are present and what their values are. They can also double the clausal heads, if a language chooses to pronounce both of them.

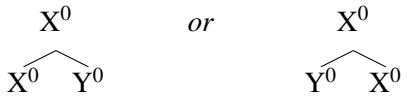
3.3 Alternative to Head Movement: External Merge

Given all of the above, I take head movement to be completely independent of the syntactic composition of complex heads, in contrast with most other syntactic approaches to morphology, including Distributed Morphology. Head movement as a syntactic process exists, but it has nothing to do with morphological composition. It simply moves a head from one position to another, without changing its form.

3.3.1 External Merge

Instead, complex heads are put together by Merge. The syntax can merge one head (Y^0) with another head (X^0) and it will project the category of one of them:

(52)



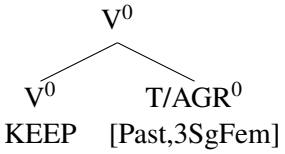
Linear order is specified as part of Merge, as illustrated: the two possible trees are distinct. If Y^0 is merged with X^0 on the right, it is a suffix, if it is merged on the left, it is a prefix.

Note that a head cannot be equated with a terminal node, because a head (the topmost X^0 in the above diagrams) can dominate other nodes. We therefore need to distinguish between heads, or X^0s, and terminal nodes, which are nodes that dominate nothing but features (morphosyntactic and phonological). Terminal nodes are all heads, but not all heads are terminal nodes.

3.3.2 Morpheme Insertion

I will assume that roots are present in abstract form from the beginning, while heads that are merged with them are at first only features. So, in English, every verb has to have a T/AGR node merged with it, as in the following example illustrating the root KEEP and T/AGR with features [Past,3SgFem]:

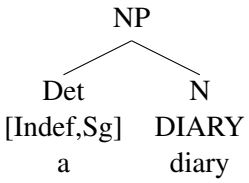
(53)



As hinted at in various places above, actual morphemes are inserted throughout the course of the derivation. I suggest that morpheme insertion takes place as each X^0 is finished, and is about to be merged with a complement or specifier (phrasal categories). A complex head will be constructed in a separate workspace from the main derivation, and when it is done, the last step before merging it into the main derivation will be inserting actual morphemes in all the terminal nodes.

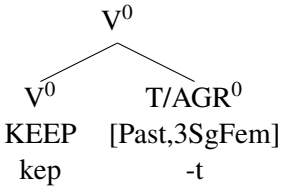
To give a concrete example, suppose the syntax is building the sentence *She kept a diary*. Assuming that the derivation works from the bottom up,[4] the syntax would construct the NP *a diary*:

(54)



In a separate workspace, it would construct the verb shown in (53). In English, this verb would be finished once T/AGR is merged with it, and it would then be ready to be merged with the NP *a diary* in the main workspace. As the last step in constructing the complex V^0, however, morphemes are inserted. The abstract KEEP takes allomorph *kep* in the presence of past tense, while [Past] takes allomorph *-t* with the root KEEP:

(55)

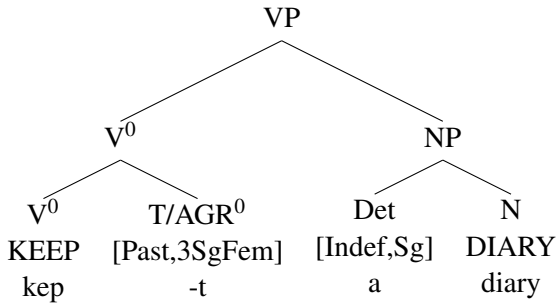


I assume that morpheme insertion works exactly as it does in Distributed Morphology. In particular, morphemes are typically underspecified for features, and may only be inserted into a terminal node if they are specified for a subset of the features of that terminal node. Where more than one morpheme matches the features on a terminal node, the most specific one beats out less specified alternatives (the Elsewhere Condition; see Kiparsky 1973, Halle and Marantz 1993, among many others). For now, I will assume that insertion takes place root outward, so *kep* is inserted in V before *-t* is inserted in T/AGR. All of this is exactly like Distributed Morphology.

What is unlike Distributed Morphology is that vocabulary insertion does not follow all syntactic operations. As described, insertion is interleaved with the syntax, so that it takes place in stages as the syntax is built. It is always the last stage of building each X^0 before merging that X^0 with phrasal categories. To continue our sample derivation, the syntactic object in (55) would then be merged with the already constructed NP to create a VP:

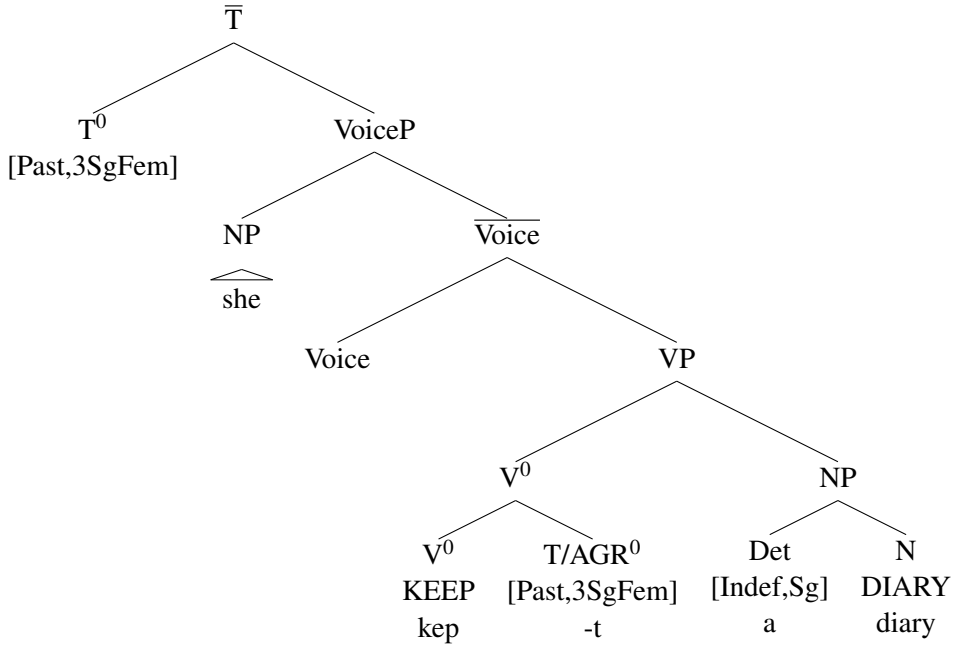
[4] I actually think this is incorrect, and the derivation works from left to right, as in Richards (1999), Phillips (2003), Bruening (2010, 2014a). However, I will leave to future work exploring the advantages that a left-to-right derivation would have for morphology.

(56)



The derivation will then proceed by merging Voice, another NP, and then T:

(57)



As described in previous sections, morphemes on the verb have to Agree with clausal heads. The head T^0 will Agree with the T/AGR node on the verb. If they do not match in features, the derivation crashes. If they do match, the derivation continues. In English, I assume that T^0 has a tense feature inherently. In our example, it will have a [Past] feature, which will match the [Past] feature on the T/AGR node on the verb. T^0 will also Agree with the highest NP in its complement, which in this case is the pronoun *she*. This will result in features [3SgFem] on the head T^0, as shown in (57). T^0 thus matches T/AGR on the verb, and the derivation is licensed and continues.

3.3.3 The Clause Matching Principle

I formalize the requirement that morphemes on the verb must match clausal heads as follows:

(58) The Clause Matching Principle:
A terminal node adjoined to the verb is matched by a syntactic head in the clause, against which it checks its feature values (by Agree).

So, in English, the T/AGR^0 head on the verb is matched by a clausal head T^0 which takes a complement and a specifier. The T/AGR^0 head on the tensed verb checks its features against the clausal T^0 head, as described in the previous section.

Note that the Clause Matching Principle does not require a one-to-one relation between heads on the verb and heads in the clause. This means that there does not need to be an AGR head in the clause to match AGR in the verb, and I assume that there is not. The Clause Matching Principle does require that there is a head for AGR to check its feature values against. I assume that this is the clausal T head again, which Agrees with an NP in the clause, as described above. Similarly, cases of multiple exponence do not require more than one clausal head, since multiple terminal nodes on the verb can all check their features against the same clausal head. I assume that Universal Grammar makes various categories available, like Aspect, Tense, Mood, etc. (and these might occupy a fixed hierarchy in the clause), and particular languages choose which ones to mark on the verb.

Note that the Clause Matching Principle is not bi-directional. If there is a terminal node adjoined to the verb, that terminal node must Agree with a clausal head. There is no general requirement that every clausal head Agree with a terminal node adjoined to the verb. Particular languages may impose such a requirement, for instance in Passamaquoddy-Maliseet a negative clausal head requires a Neg morpheme on the verb to Agree with. In general, however, clausal heads do not necessarily require a matching morpheme on the verb.

The Clause Matching Principle also only refers to verbs. It does not refer to any other syntactic categories. I do not believe that nominals, in particular, are parallel to clauses in including a sequence of functional projections dominating a lexical category (see Bruening 2009b and Bruening, Dinh, and Kim 2016). I therefore do not include nominals under the Clause Matching Principle, and leave open the proper analysis of nominals (but see the analysis of Classical Armenian in section 4.4). I will also not address adjectives or other categories here, except for brief remarks about comparative adjectives in section 4.2.

Finally, many languages (like the Romance languages) have verb class morphemes, which I assume are also terminal nodes adjoined to the verb. By the Clause Matching Principle, there must be a clausal head against which they check their features. I assume that in the case of verb class morphemes, it is the V head itself that Agrees with the morpheme. Each lexical root verb will be specified for a class, which must match the features on the terminal verb class morpheme adjoined to it.

3.3.4 On Ordering and the Mirror Principle

One argument that proponents of head movement accounts make for head movement is based on the Mirror Principle (Baker 1985), the claim that the order of morphemes reflects the order of heads in the clause. The claim is that each morpheme is added to the verb as it undergoes head movement, so that the order of morphemes will directly reflect hierarchy (lowest closest to the root, highest furthest from the root).

As it is stated in (58), the Clause Matching Principle does not say anything about order. Nothing so far would lead one to expect that there would be any relation between the order of morphemes on the verb and the hierarchical order of the clausal heads.

This is deliberate, because it is not clear that the Mirror Principle is real. As noted above, negative morphemes on verbs are often not where they should be, given that sentential negation has to operate on the entire proposition. The only large-scale analysis of morpheme order that I am aware of, Julien (2002), seems to show that all possible orders of V, T, Asp, and Agr (both subject and object) are attested in the languages of the world (this is hard to tell for sure, since the tables in Julien 2002 mostly leave out Asp). This is not expected by the Mirror Principle, where T should always be higher than and therefore farther from the root than Asp.[5] Unexpected affix orders are described in numerous languages, for instance Bantu

[5]Julien (2002) attempts to explain away orders that should not exist according to her own analysis, by reanalyzing the morphemes involved (primarily by claiming that what a source calls an aspect marker is actually not). However, there is a methodological problem with doing this: if one were to also reanalyze the data that appeared initially to fit one's predictions, would the data still fit those predictions? In other words, it is not methodologically sound to only reanalyze the problematic data. If 100% of the languages that are looked at more closely are found to have been mischaracterized, then we have to expect that some similarly high percentage of the languages that were not looked at more closely were also mischaracterized, and we cannot trust the data at all.

languages (Bresnan and Moshi 1990, Hyman 2003), Athapaskan languages (Rice 2000), and others (e.g., Safir and Bassene 2017).

The best evidence for the Mirror Principle, including most of the evidence in Baker (1985), comes from valence-changing morphology like the reciprocal described above, causatives, passives, and similar processes. In many languages, reversing the order of, say, a reciprocal plus a causative, reverses the interpretation, in exactly the way the Mirror Principle would expect. However, in other languages, a single morpheme order can be ambiguous with respect to the scope of the two morphemes (e.g., the Bantu languages described in Bresnan and Moshi 1990, Hyman 2003). This makes the putative universality of the Mirror Principle extremely suspect.

Without a large-scale typological investigation, the jury is still out on whether the Mirror Principle is actually correct. There are certainly numerous deviations from it in many different languages. I will not propose any strict mirroring principle, and leave open how to account for any ordering tendencies that do occur. If there are ordering effects, I suggest that they follow from psycholinguistic factors, or from patterns of historical change.[6]

3.3.5 Summary

Rather than head movement, Consolidated Morphology puts together complex heads by merging them directly. The morphemes on the verb are not clausal heads. Instead, they must check their features against clausal heads, by Agree. The terminal nodes of a complex head are at first abstract roots and syntactic features, but morpheme insertion takes place as soon as the complex head is complete and is about to be merged into a derivation. From that point on, actual phonological and semantic content is present.

This analysis fully expects cases of multiple exponence, where more than one head adjoined to a verb Agrees with the same clausal head, and doubling, where a morpheme on the verb co-occurs with a free-standing marker in the clause. Both of these are problematic for simple head movement accounts.

3.4 Summary of Mechanisms

The only mechanisms that we need for morphology are ones that we also need for syntax: Merge and Agree, and feature insertion and deletion. We also need a mechanism of morpheme insertion, but this is something that any theory of morphology will have to have. Morphology is therefore very limited, and there are no morphology-specific mechanisms. There are only mechanisms of the morphosyntax generally.

This is a vast simplification from Distributed Morphology. There is only one level, the morphosyntax, and there is only one list of stored items, the lexicon. The only mechanisms are Merge, Agree, and feature insertion and deletion. There is no need for a post-syntactic level of Morphological Structure, and no need for mechanisms like post-syntactic movement, fission, fusion, or any other morphology-specific devices.

Before moving on, I should note that, although I adopt some ideas from Chomsky's Minimalist Program (Chomsky 1993, Chomsky 2000), like Merge, Agree, a single level of structure building, and a locality condition like the Phase Theory (Chomsky 2000), I do *not* adopt other aspects of the Minimalist Program. In particular, I make no distinction between unvalued and valued features, or uninterpretable and interpretable features. I also reject the view that all movement is feature driven. Instead, I view a grammar of a language as a collection of largely language-particular rules and constraints, built on top of a core from Universal

[6]It is also possible that we need to distinguish clausal heads like T, Asp, and so on, from valence-changing operations like the reciprocal and the causative. If there really are Mirror Principle effects with the latter (and the counterexamples can be explained away), we should build a theory where the morphology indicates the order of application of these processes. Such a theory would not necessarily have clausal heads, for instance a Reciprocal or Causative head could be merged directly with the verb, with no mediation by a clausal head, and no maximal projection for the Reciprocal or Causative. The order of merger would then necessarily indicate the order of application.

Grammar. As an example, in section 3.1.3 I proposed rules in English that moved finite auxiliaries over negation and adverbs. These movements are not driven by the need to check features. They are largely arbitrary and are particular to English. One is optional. I will propose other types of rules and constraints in the case studies in the next chapter. Regarding inflectional morphology, particular languages will simply stipulate what heads have to merge with V or other categories, what those heads have to Agree with, and so on. Such statements are unavoidable, as languages just differ from each other in their morphosyntax.

Chapter 4

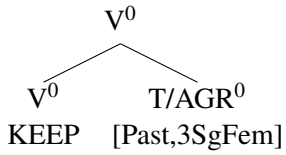
Case Studies

Now that we have established the architecture of the model of Consolidated Morphology, and the morphosyntactic mechanisms it assumes, we can begin to analyze some data. This chapter goes through several case studies to illustrate how Consolidated Morphology works. These include English verbal morphology, English comparatives and superlatives, Classical Arabic verbal morphology, Classical Armenian nominal declensions, and Passamaquoddy-Maliseet verbal morphology.

4.1 English Verbal Morphology

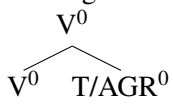
I will begin illustrating how Consolidated Morphology works with the first case study, English verbal morphology. As described in section 3.3.2, verbs in English are formed by merging a T/AGR^0 with V^0 :

(59)



This is true of both main verbs and auxiliary verbs, and of all verbs in a clause when there is more than one. The English grammar includes a well-formedness constraint of the following form:

(60) An English V^0 must have a T/AGR^0 head adjoined to it:



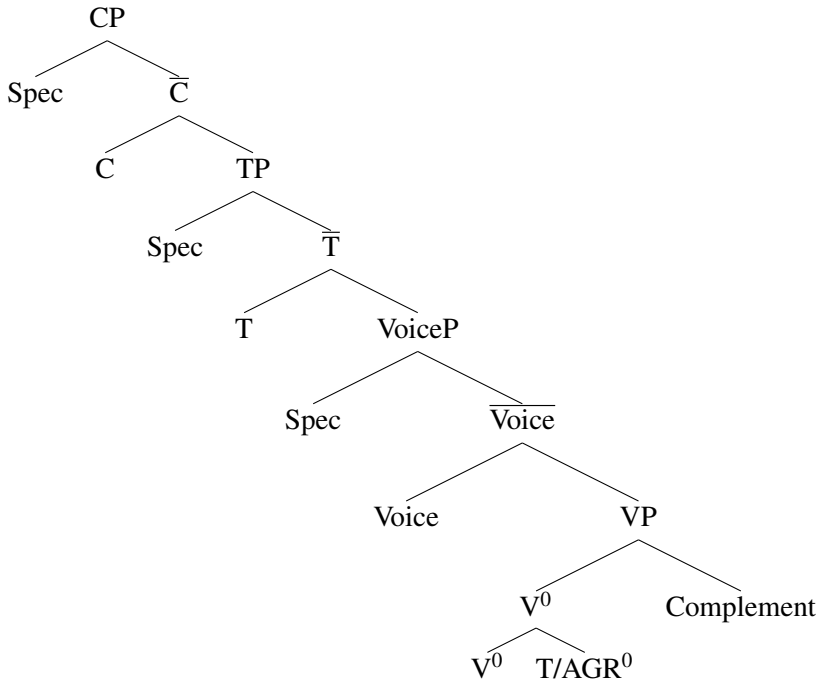
As stated in section 3.3.2, roots (the head V) are present in abstract form from the beginning, but terminal nodes that are adjoined to it are feature values, as in the example in (59).

Possible values of Tense are [Past] and [Nonpast], or unspecified (non-finite, indicated [–T]). Possible values of AGR are the phi-features, which include first, second, third person; singular and plural; and masculine, feminine, and non-human. (I leave open what the right theory of features is: whether they are binary or privative, and whether they are organized into some kind of hierarchy.) AGR can also be unspecified, indicated [–AGR], in which case there are no phi-features.

4.1.1 Clausal Syntax

The clausal syntax of English includes minimally the following elements:

(61)

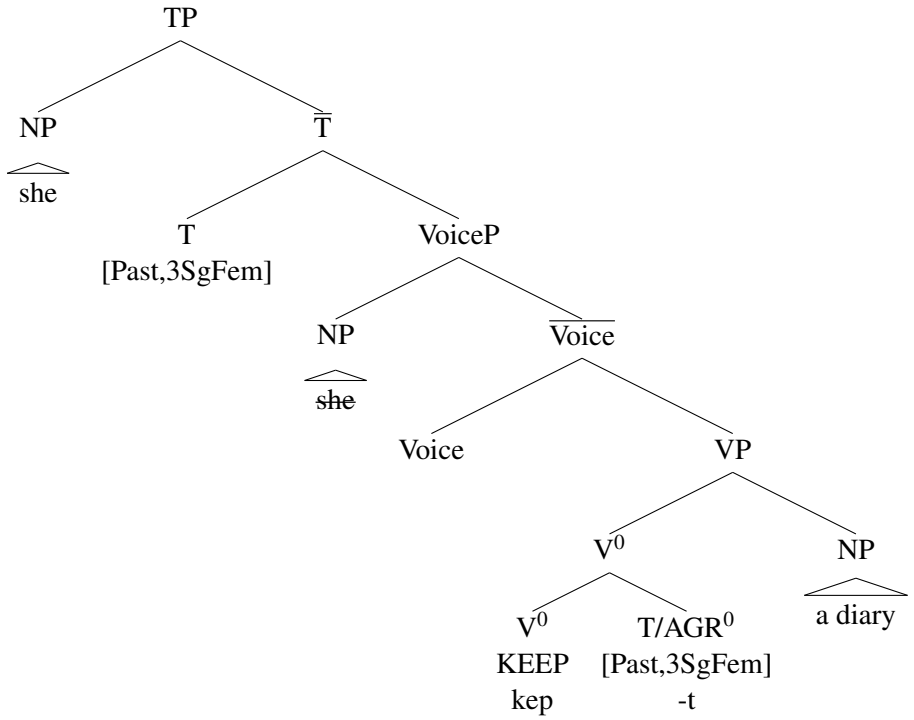


C is the complementizer head, which hosts complementizers and inverted auxiliaries. Its specifier is the position for fronted wh-phrases. Spec-TP is the surface subject position, while Spec-VoiceP is the underlying position for thematic external arguments (Kratzer 1996). The complement of the verb may be an NP, CP, AP, PP, etc. T Agrees with an NP in its sister, typically the NP occupying Spec-VoiceP. This NP will also typically (but not always) move to Spec-TP, but this is irrelevant for agreement. T then has the features [Past/Nonpast] (inherently) and the phi-features of the subject (by Agree). T also Agrees with the matching T/AGR head on the highest verb in its sister, to satisfy the Clause Matching Principle. T/AGR adjoined to the verb is merged with a set of tense and AGR features, which are checked against the clausal T head in this step of Agree. If C is non-finite rather than finite, it selects a non-finite T, which is specified [–T,–AGR]. These values will also be checked against the T/AGR head on the highest verb.

4.1.2 Example: Main Verb Only

To give an example, suppose the clause being built is *she kept a diary*, as in section 3.3.2. The clause will look like this once constructed, with the external argument moving to Spec-TP (I omit C):

(62)



T Agrees with the NP in Spec-VoiceP. It then has the feature [Past] inherently, and the features [3SgFem] by Agree. It Agrees with the T/AGR node on the V. Since they match, the derivation succeeds. As described in section 3.3.2, actual morphemes are inserted within the V^0 right before it is merged into the VP.

I posit the following morpheme inventory for the T/AGR node in English (ordered from most specified to least specified):

(63) English T/AGR

a. -s ↔ [Nonpast, 3, Sg]

b. -en ↔ [Past, –Agr] / {BREAK, EAT, BE,...}___

c. -ing ↔ [Nonpast, –Agr]

d. -Ø ↔ [Past] / {BREAK, EAT,...}___

e. -t ↔ [Past] / {KEEP, SWEEP,...}___

f. -ed ↔ [Past]

Three of these morphemes specify a contextual restriction, so that they can only be inserted if the root V is one of a small, listed set. The list is given in curly brackets (in abbreviated form).

As can be seen, *-t* is the most highly specified morpheme that matches T/AGR where that has the features [Past,3SgFem] as in (62). Both *-t* and *-ed* match [Past], but *-t* is further specified to only appear with a certain list of verb roots. This makes it more specified, so it will be inserted rather than *-ed*.

As for the root, recall that it has a special form in the context of [Past], namely, *kep-*. This analysis lists two stem forms for verbs like KEEP, *keep* and *kep*. An alternative would be to posit a single stem, with a morphophonological rule that applies in a [Past] environment. I can see nothing that would decide between these two alternative analyses, so I will take no stand on which is correct, although I will speak as though having two distinct stem forms is the correct analysis.[1] Note that a special stem form can appear in two different environments but with two different realizations of T/AGR. For instance, BREAK, like KEEP, has

[1]One could argue that simply listing the two forms is treating them the same as suppletion, in which case it is an accident that they overlap considerably in phonological form. This might be a consideration in favor of a morphophonological rule. On the other

two stem allomorphs *break* and *broke*, with the form *broke* appearing in the context of [Past]. However, unlike KEEP, the past tense form *broke* appears in the simple past with a null T/AGR, but with an overt *-en* in the past participle (*broken*). This is because the stem BREAK appears on two different lists in (63b).

4.1.3 Example: Auxiliaries

The features of T are always checked against the T/AGR of the highest verb, because of the locality of Agree. So, if there is an auxiliary verb, T will Agree with the T/AGR of the highest auxiliary verb. Each auxiliary verb then Agrees with the T/AGR node on the highest verb in its complement. In this case, each auxiliary has a different feature specification that it must Agree with, as follows:

(64) a. *have*: [Past,–Agr]

b. passive *be*: [Past,–Agr]

c. progressive *be*: [Nonpast,–Agr]

d. modals and *do*: [–T,–Agr]

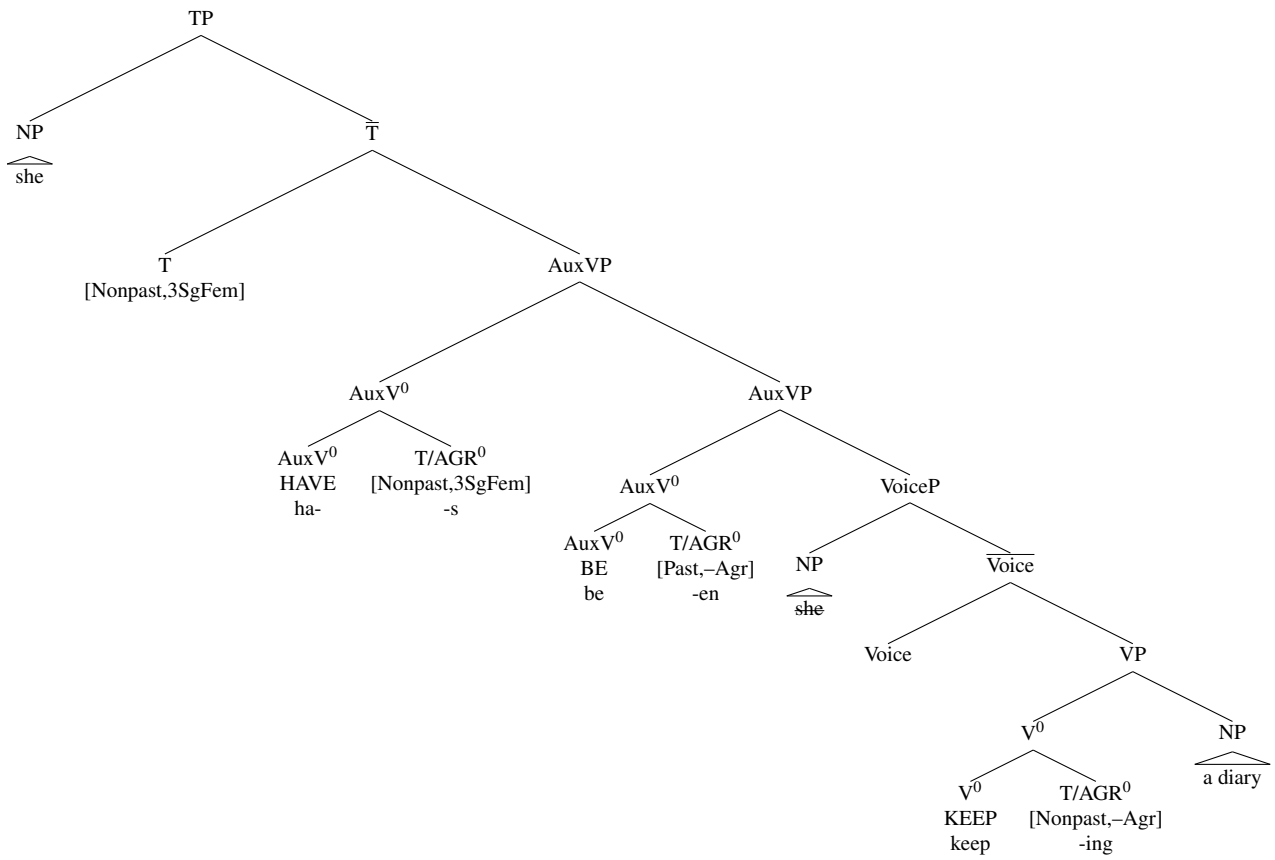
T/AGR on the verb that the auxiliary Agrees with will then have to match these features. Looking at the list in (63), *have* will require the *-en* form, or one of the [Past] forms if *-en* does not match (which will happen if the verb is not on the list for *-en*). Passive *be* is the same. Progressive *be* will always trigger the *-ing* ending. Note that nothing matches the modals and *do*, so nothing will be inserted in T/AGR on the complement of one of them. The verb will therefore always be in its bare form.[2]

To give an example, *She has been keeping a diary* will have the following structure (leaving out C):

hand, one could also argue that the morphophonological rule may have been historically motivated, but is completely unmotivated in the synchronic grammar. In this case, the two stem forms really are in essentially a relation of suppletion in the minds of modern speakers. Since I can see no evidence in favor of either one of these alternatives, I will leave the choice open.

[2]Note that this approach therefore has two distinct types of null morpheme: one is an actual morpheme, which can be inserted into a terminal node and block other morphemes from appearing in that node (63d). The other is literally nothing, meaning that nothing matches and nothing is inserted into the terminal node. This is simply a terminal node with no phonological specification. This can be viewed as the universal default item, since if nothing else matches, nothing will be inserted.

(65)



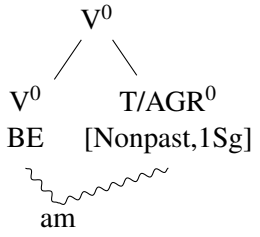
T Agrees with T/AGR on the highest verb, HAVE. The HAVE auxiliary Agrees with T/AGR on the next verb down, BE. BE Agrees with T/AGR on the main verb. The morphemes that will be inserted in each of the T/AGR nodes are the ones shown, as should be clear from the list in (63).

Once again, the verb and T/AGR may each take a special form depending on the other. We saw this above, where V is KEEP and T/AGR includes [Past], then *kep* is inserted in V and *-t* in T/AGR. In the example with auxiliaries in (65), HAVE has an allomorph *ha-* that appears in the context of a T/AGR that is [Nonpast,3Sg]. BE and KEEP are in their general forms (but in US English, *be-en* is pronounced exceptionally with a lax vowel).

4.1.4 Portmanteaux: Insertion into Spans

Suppose now that V is BE and T/AGR is [Nonpast,1Sg]. In this case the form that is pronounced is *am*. This form seems to realize both BE and T/AGR simultaneously (it is a portmanteau morpheme). The approach to these that I will adopt is to allow morphemes to match more than one terminal node and to be inserted into both of them simultaneously. This is an idea with a long history, formalized most recently in the theory of *spans* in Merchant (2015). I indicate this graphically, following Merchant (2015), with squiggly lines:

(66)



I will define a span as follows (compare Merchant 2015, (28)):[3]

(67) Let T be an ordered n-tuple of terminal nodes $\langle t_1, \ldots, t_n \rangle$ such that there is an X^0 that dominates every $t \in T$, and for any $k > 1$, t_k immediately c-commands t_{k-1}.

a. For all $k = 1 \ldots n$, t_k is a span. (Every node is a trivial span.)

b. For any $n > 0$, if t_k is a span, then $\langle t_k, \ldots, t_{k+n} \rangle$ is a span.

According to this definition, V and T/AGR constitute a span, and a single morpheme can be inserted into both of them.

Like various forms of BE, all the modals also insert into the span V T/AGR. They therefore never show any inflection. Note that this is the approach I will take to *portmanteau morphemes* in general: they are inserted into a span consisting of multiple terminal nodes. Other case studies in subsequent sections will also make use of insertion into spans.

Recall that the analysis given above lists two stem forms for verbs like KEEP and BREAK (*keep, kep; break, broke*). Consider now verbs like SING and HIT, which never have an overt form for T/AGR in [Past] environments. We will have to list three different forms for verbs like SING: *sing* as the general form, *sung* for the context [Past,–Agr], and *sang* for the context [Past]. There is also now an analytical choice: we can either analyze T/AGR as the zero morpheme (that is, SING is on the same list as BREAK and EAT in (63d)), or we can analyze *sang* and *sung* as portmanteaux, matching the span V T/AGR. The general form *sing* cannot be a portmanteau, because it forms *sing-s* and *sing-ing*. If we go for the portmanteau analysis, HIT would have two phonologically identical stems, *hit* (general) and *hit* ([Past]), but only the latter would be a portmanteau, since the general one forms bimorphemic *hit-s* and *hitt-ing*. Simply for the sake of a uniform analysis of HIT, I will go for the zero morpheme analysis, and include SING and HIT on the list for the zero allomorph of [Past] in (63d).

As noted immediately above, I do analyze forms of BE as portmanteaux. I formalize them as follows, matching more than one terminal node:

(68) forms of BE (non-past only)

a. am $\leftrightarrow$ V_{BE} T/AGR:[Nonpast, 1Sg]

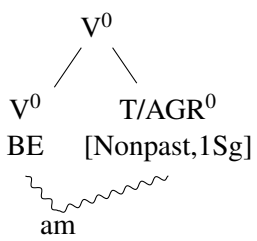
b. is $\leftrightarrow$ V_{BE} T/AGR:[Nonpast, 3Sg]

c. are $\leftrightarrow$ V_{BE} T/AGR:[Nonpast, +AGR]

d. be $\leftrightarrow$ V_{BE}

For all the cases in this paper I will assume that morpheme insertion proceeds from the root outward.[4] In this case, morpheme insertion begins with V:

(69)



[3] Node A *immediately c-commands* node B iff node A c-commands node B and there is no node C such that C c-commands B but does not c-command A.

I do not use Merchant's definition because it relies on the notion of an *extended projection* from Grimshaw (2005). There is no sense in which functional heads in the clause are projections of the verb (Bruening, Dinh, and Kim 2016), so this is not a viable definition.

[4] An alternative is that morpheme insertion takes place left-to-right, rather than root-outwards. In all the cases considered here, this will make no difference.

Am can be inserted, because it matches V and T/AGR. Since T/AGR has had a morpheme inserted into it, morpheme insertion stops and no other morpheme can be inserted into T/AGR.

If instead T/AGR is [Nonpast,–Agr]—because it is selected by progressive *be*—then only *be* can be inserted in V. *Be* is not a portmanteau, and matches only V. Therefore *-ing* can be inserted in T/AGR, yielding *be-ing*. If T/AGR is non-finite ([–T,–AGR]), *be* will be inserted in V and nothing will be inserted in T/AGR.

4.1.5 Interim Summary

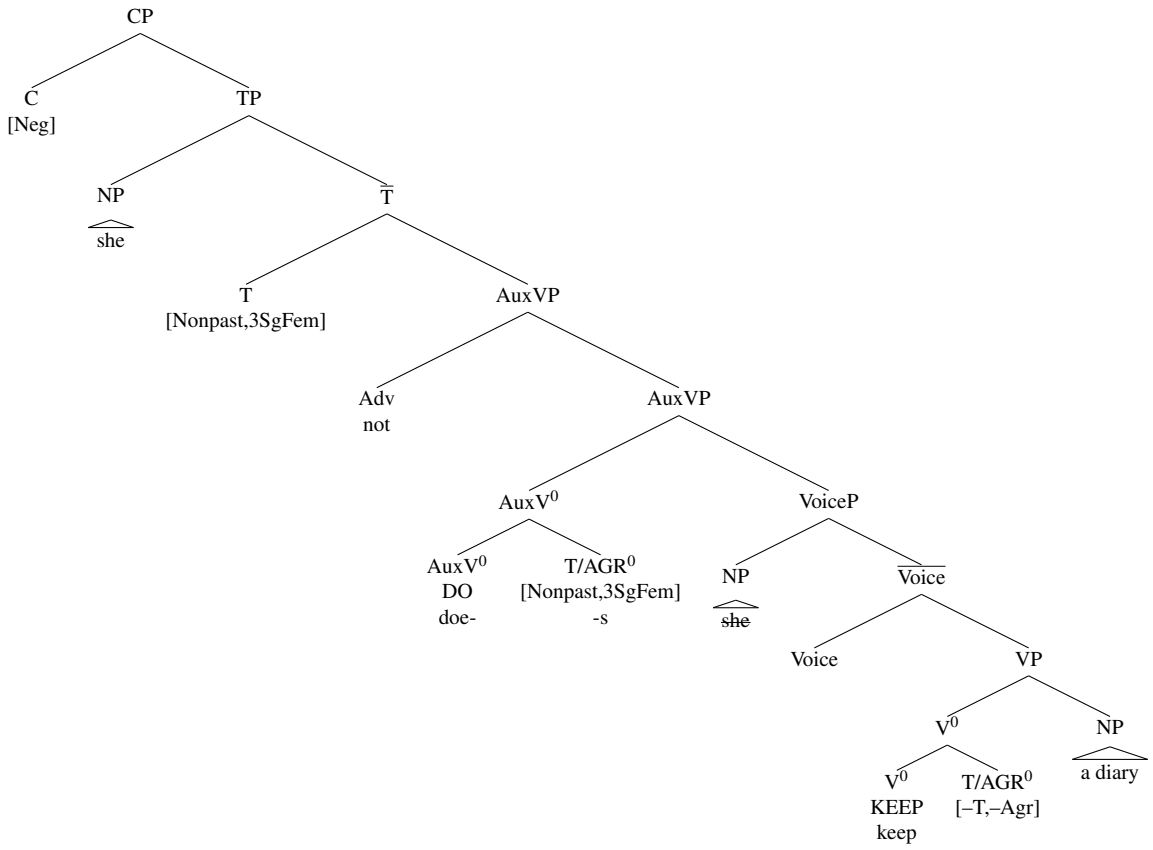
English verbs, main and auxiliary, always have a T/AGR node adjoined to them. This has to Agree with a clausal head. The highest verb Agrees with the clausal head T, while lower verbs Agree with the immediately higher verb. Morphemes are underspecified and are inserted according to the Elsewhere Principle. In some cases, a morpheme can be inserted into a span, realizing multiple terminal nodes. These are portmanteau morphemes.

In many respects, this analysis is very similar to the analysis of English verbal morphology in Halle and Marantz (1993). However, in other respects it is very different. In particular, the syntax I assume is very different. There is no head movement involved, nor is there affix lowering when there is no auxiliary verb. This necessitates a very different approach to *do*-support and negation, next.

4.1.6 *Do*-Support and Negation

In this account, *do*-support is not about the blocking of head movement or affix hopping or some post-syntactic lowering operation. Rather, *do*-support environments require the presence of an auxiliary, as in Baker (1991) and Bruening (2010). The clause is specified as having certain properties, which can only be met by the finite verb being an auxiliary. If there is no auxiliary, the semantically contentless auxiliary *do* is used to meet this formal requirement. This gives us the following structure for *She does not keep a diary*, where *not* adjoins to the highest AuxVP:

(70) She does not keep a diary.



Importantly, *do*-support has nothing to do with morphology, or with head movement. T can Agree with the T/AGR on *do* right through the adverb *not*, as we know from Danish (and other adverbs in English). The auxiliary *do* may or may not move; it does obligatorily move across negation in English (see section 3.1.3), and so would move in the tree above, but this is irrelevant to the inflection.

For details of this analysis of *do*-support, and arguments for this view and against the usual analysis where *do* is inserted as morphological support for Tense, see Bruening (2010). We saw some such arguments in section 3.1.

Sentential negation is one of the most important environments for *do*-support, and it will also figure prominently in some of the case studies to come later in this chapter. It was also shown in chapter 3 to not fit nicely into a theory where there is a clausal head Neg and the verb moves to or through Neg. It is therefore important to spell out an analysis of negation.

Sentential negation can be realized in several different ways and in several different locations within a clause, both across languages and within a single language. In English, it can be spelled out in at least the following ways:

(71) Realizations of sentential negation in English

a. The adverb *not* is adjoined to the highest AuxVP, and the highest Aux moves over it:
She has not eaten yet.

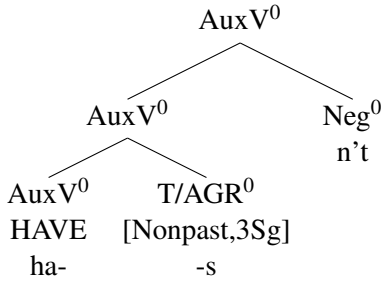
b. The highest AuxV may have a Neg head adjoined to it outside the T/AGR head:
She hasn't eaten yet.
Why hasn't she eaten yet?

c. In certain registers only, and only if an AuxV moves to C: The adverb *not* is adjoined to TP:
Have not you always hated him? (Jane Austen, *Pride and Prejudice*, 1813);

Had not both Chade and the Fool hinted, no, pleaded for this very idea? (Robin Hobb, *Royal Assassin*, 1996)

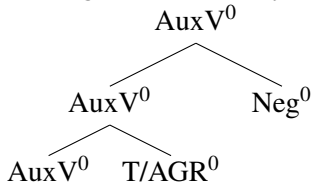
Option (a) is illustrated in (70). I will follow Zwicky and Pullum (1983) in analyzing option (b) as an AuxV with a negative suffix on it. In my terms, this means that AuxV has both a T/AGR node and a Neg node adjoined to it:

(72)



The whole V^0 can undergo head movement, for instance movement to C in a question (*Why hasn't she eaten yet?*).[5] Adjoining Neg to an AuxV has to be optional, so the well-formedness constraint must permit but not require that Neg adjoin:

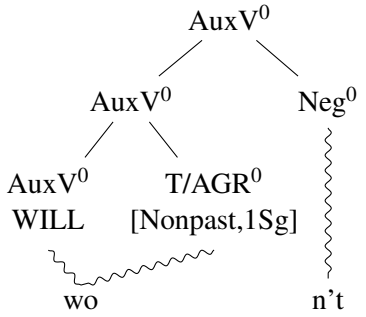
(73) An English $AuxV^0$ may have a Neg^0 head adjoined to it outside of T/AGR^0:



(Since AuxVs are a sub-type of V, AuxVs are also subject to the well-formedness condition in (60), requiring them to have a T/AGR node adjoined to them.)

As mentioned above, I assume that all the modals match the span V–T/AGR. Some of them take a special form in the context of negation. For instance, WILL takes the form *wo* in the context of negation (see Zwicky and Pullum 1983). The morpheme *wo* is inserted into the span V-T/AGR[Nonpast], while *n't* realizes Neg:

(74)



As noted above, sentential negation is realized in many different ways cross-linguistically, and in many different locations. Even in English it can be realized in three different ways. I therefore do not posit a NegP

[5]Note that an alternative is that contraction is simple cliticization, with the adverb *not* attaching to the auxiliary to its left phonologically. Contraction in inversion contexts would have to be from option (c), where *not* is adjoined to TP. If we went for this analysis, we would have to say that contraction is obligatory when *not* is adjoined to TP, except in certain registers. I do not pursue this analysis, because contracted *n't* behaves very differently from other cases of simple cliticization, like contraction of *have* to *'ve*. See Zwicky and Pullum (1983) and immediately below.

projection in the clause. Instead, I propose that sentential negation is a feature [Neg] on the clausal head C, as illustrated in (70). C with a [Neg] feature must Agree with some negative element in the clause, the options for which are specified on a language-by-language basis. In English, C can Agree with *not* adjoined to either the highest AuxVP or to TP (in certain registers). It can also Agree with a Neg terminal node adjoined to the highest V. If there is a Neg node on the V, then by the Clause Matching Principle, that node must Agree with some clausal head, in this case C. So contracted negation is always sentential negation. The adverb *not*, in contrast, does not necessarily have to Agree with C; this is the case for constituent negation, I assume. Contracted negation can never be constituent negation.

In this analysis, sentential negation does not head its own projection. Rather, it is a feature of clauses. It can be spelled out in various ways, and even more than once, as we will see in the analysis of Passamaquoddy-Maliseet in section 4.5.

Note that we do not need to stipulate that *not* can only adjoin to TP when the finite auxiliary moves to C. This restriction follows from general constraints of the English grammar. Recall that finite auxiliaries necessarily move across negation. I propose that this follows from the following constraint:

(75) * *not* V[Fin], where *not* precedes and c-commands V[Fin]

This constraint bans a finite verb to the right of negative *not*. (The c-command restriction permits sentences like *not a single person left*.) The English rule that moves the finite auxiliary across negation is a response to this constraint. If *not* adjoins to TP, the constraint will be violated if the finite auxiliary does not move across it. There is furthermore a set of constraints in English on when the finite auxiliary may and must move to C. I will not attempt to formalize these constraints here, but merely note that movement of the finite auxiliary to C is not generally allowed, it is only allowed in certain contexts, for instance in certain questions, in conditionals, in the presence of a fronted negative element, and so on. These constraints will block the finite auxiliary from moving across negation adjoined to TP in environments where subject-auxiliary inversion is not allowed, for instance a simple declarative:

(76) a. * Had not they advocated for that idea.
b. They had not advocated for that idea.

This means that the restrictions on when *not* can adjoin to TP just fall out from other constraints of the English grammar.

Note also that the constraint in (75) accounts for the observation of Embick and Noyer (2001) that constituent negation is ungrammatical without an auxiliary:

(77) a. John can always not agree.
b. * John always not agrees. (Embick and Noyer 2001, 585, (71a))

The sentence in (77b) violates the constraint in (75), since a negative element precedes and c-commands the finite verb. Contrary to Embick and Noyer (2001), however, I find *do* with constituent negation acceptable, preferentially following an adverb if one is present:

(78) John always does not agree.

Embick and Noyer (2001) do not present such a sentence, but they claim that *John does always not agree* is ungrammatical. I do not agree with this, and find it relatively acceptable, although the order in (78) is much better (probably because of stress on the auxiliary). In any event, if any speakers do find constituent negation with *do* degraded, this would just follow from the relative unacceptability of *do* in a simple declarative. A sentence with constituent negation is not a negative sentence (does not have [Neg] on C in the analysis here), and so it is not one of the environments for *do*-support. Emphatic stress or verum focus is one of

the environments for *do*-support, so we expect that sentences like (78) will be acceptable with stress on the auxiliary. This seems to be correct. In any case, all of the facts of negation follow in the analysis presented here, without the need for post-syntactic lowering or the other mechanisms of Embick and Noyer (2001). The only rules and constraints we need are ones we need anyway for an adequate account of English grammar.

Before moving on, it should also be reiterated here that X^0s are syntactic entities and are distinct from prosodic units. Many of the functional elements in the English clause have reduced forms that lean on adjacent elements prosodically, and look superficially like negative *n't*. The auxiliary *have*, for example, has a reduced form *'ve* that forms a prosodic word with the element to its left. This can produce *should've* or *shouldn't've*, among other things. But note that while *shouldn't* can undergo head movement to C (*Shouldn't we have helped them?*), *shouldn't've* cannot, nor can any other auxiliary plus *'ve*:

(79) a. * Shouldn't've we helped them?

b. * Should've we helped them?

Reduced *'ve* can also lean on things besides auxiliaries, like the subject in *we've*. This is not true of *n't*, which cannot even attach to the non-finite auxiliary *to* (*The best we can hope for is to not (*to'nt) come in last*).

In the syntax, *shouldn't* is a single (but complex) X^0, as in (72), but *'ve* is a separate X^0 (syntactically identical to the unreduced *have*). Reduced *'ve* can be mapped to a single prosodic word with the element to its left, but this does not make the two of them a single X^0 in the syntax. Typically, mapping principles map a maximal X^0 to a prosodic word and vice versa, but this mapping is not always one to one, as this example illustrates. Another example is *whatcha*, a prosodic word formed from an NP in Spec-CP (*what*), an auxiliary in C (*are*), and a pronoun in Spec-TP (*you*). No syntactic operation could ever put two specifiers and a head together, so we clearly need a prosodic rule forming prosodic words from heads under adjacency. Additionally, a complex X^0 can be mapped to more than one prosodic word under some conditions (e.g., compounds with phrases as their first members).[6]

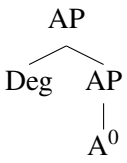
4.2 English Comparatives and Superlatives

English comparatives and superlatives have always constituted a challenge to the strict separation of syntax and phonology, since they involve a synthetic-analytic alternation that is conditioned by phonological and semantic factors. For this reason they have been extensively discussed in the morphology literature (e.g., Corver 1997, Embick and Noyer 2001, Stump 2001, 208–210, Embick 2007, Embick and Marantz 2008, Bobaljik 2012, Matushansky 2013). The architecture and mechanisms of Consolidated Morphology enable a simple and satisfying account of their properties.

There is a phonological and a semantic condition on comparative formation in English: only adjectives that are a single prosodic foot can form *-er* comparatives (*smarter*, **intelligenter*), and only if they are not norm-related (**Frencher*; Matushansky 2013). All others form the periphrastic *more A* (*more intelligent*, *more French*). Moreover, doubling is possible with comparatives cross-linguistically (*more smarter*; Bobaljik 2012), though this is viewed as substandard in adult English. The possibility of doubling is something that most analyses have no account of, since they posit a single Deg(ree) head in the syntax that is realized either as *-er* or as *more*.

[6]The auxiliary *have* can even reduce further with the modals, yielding *shoulda*, *coulda*, *woulda*. In typical lexicalist models, these should be stored entities and unanalyzable wholes. However, even these cannot undergo head movement as a unit, indicating that they are actually two separate X^0s. I take such facts to illustrate the fundamental incorrectness of lexicalist models.

My treatment of comparatives will not involve head movement, given the arguments in section 3.1.5 that head movement is not correct. First, following many analyses of comparatives, there is a Deg head that selects an A whose projection it adjoins to (e.g., Corver 1997, Embick 2007, Bobaljik 2012):[7]

(80)


In English, a head A that is going to be merged with Deg must be given a feature that I will call [Δ]. However, this is subject to two conditions:

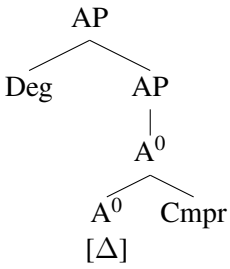
(81) Conditions for insertion of [Δ] on A:

a. The A must be a single prosodic foot; and

b. The A must head an AP that not norm-related.

If these two conditions are not met, the feature [Δ] may not be added to A. If they are met, then it must be.

Furthermore, a head A with the feature [Δ] must have either a Cmpr (for "comparative") or a Supr ("superlative") head adjoined to it, while an A without that feature may not have such a head adjoined to it:[8]

(82)


The feature and the head are added *before* the A merges with anything else to form the AP, and actual morphemes will be inserted prior to that, as well. The tree shows the full structure of the AP.

Now, several things can happen. First, certain As can have special forms in the local context of the feature [Δ]. For instance, BAD has a special form *worse* in the context of [Δ]. GOOD has a special form *better* in the context of [Δ]. The Cmpr head itself can have one of two morphemes inserted into it, depending on the context:

(83) English Cmpr

a. Ø ↔ Cmpr / {GOOD, BAD,...}___

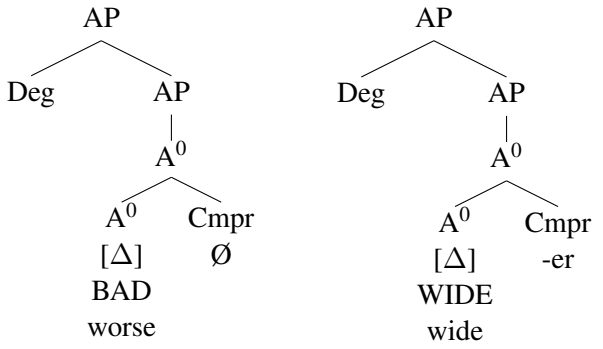
b. -er ↔ Cmpr

So, roots like GOOD and BAD have a special suppletive form in the context of the feature [Δ], and with them, the Cmpr morpheme is null. With all other stems, the Cmpr morpheme is *-er*:

[7] Deg selecting A does not require that the category of the resulting phrase be DegP. It can still be AP, if Deg selects as an adjunct. Adjuncts select, but do not project their category labels (Pollard and Sag 1994, Bruening 2013). Since comparative adjectives have the distribution of regular adjectives, I assume that the category of the whole phrase is AP.

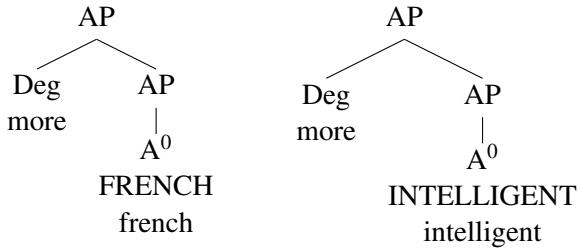
[8] It is also possible that the Supr head always also occurs with the Cmpr head adjoined to the A inside of it, as in Bobaljik (2012).

(84)



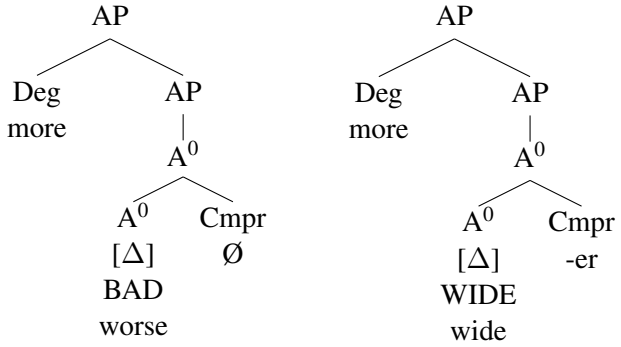
As noted above, the feature [Δ] can only be added to an A if it is a single prosodic foot and is not norm-related. The Cmpr head can only be adjoined to an A with the [Δ] feature. So, with the As FRENCH (which is norm-related) and INTELLIGENT (which is too long), there will be no Cmpr head:

(85)



Deg is realized as *more* in a comparative. In Standard English, only one of Deg and Cmpr can be pronounced, and one of them must be. In substandard English, however, both can be pronounced at the same time:

(86) Substandard English



It is also possible to have both suppletion and *-er* at the same time, as in *more worser, most bestest*. This possibility shows that there is a null Cmpr head with forms like *worse* (see chapter 5).

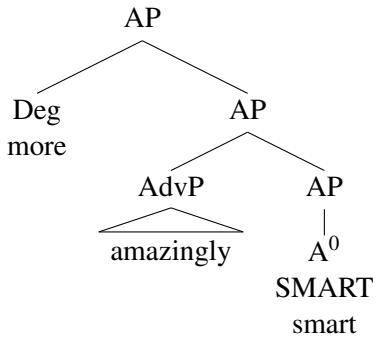
As Embick and Noyer (2001) and Matushansky (2013) show, adverbs and post-adjectival PPs block the *-er* comparative on the relevant reading (where the comparative has the adverb or PP in its scope):

(87) a. more amazingly smart, *amazingly smarter (on relevant reading)

b. more smart to an amazing degree, *smarter to an amazing degree (on relevant reading)

Following Matushansky (2013), I analyze this as an effect of semantics. Adverbs and PPs make the AP norm-related (that is, someone who is more amazingly smart than someone else is necessarily amazingly smart, whereas someone who is smarter than someone else may not be smart at all). This blocks the feature [Δ], given the condition in (81b). The Cmpr morpheme cannot be added, and Deg must be pronounced:

(88)

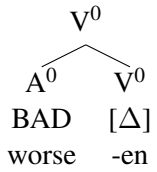


Since the feature [Δ] is not present, adverbs and PPs also block suppletive forms: *more selfishly bad/*worse, more bad/*worse to an amazing degree*.[9]

The current analysis does without post-syntactic lowering or reordering, as in Embick and Noyer (2001), Embick (2007), Embick and Marantz (2008). There is simply no need for such operations in the current model. Additionally, Bobaljik (2012) and Matushansky (2013) show that post-syntactic lowering is problematic. However, they also argue that we need head movement of A to Deg in the synthetic cases. This is also totally unnecessary in the analysis here. Not only is it unnecessary, head movement runs into problems with change-of-state verbs derived from adjectives, as was shown in section 3.1.5. As Bobaljik (2012) shows, these always involve the suppletive form of the adjective if it exists (*to better*, *to worsen*). However, in the head movement analysis, *worse* has the same status as regular *-er* comparatives like *wider*: they both involve head movement to Deg. We would therefore expect the change-of-state verb based on *wide* to include *wider*, contrary to fact (*widen*, **wideren*). In fact, the regular comparative morpheme (*-er* in English) is never included in the derived change-of-state verb, only suppletive stems are.

I propose instead that the verbalizing head that derives change-of-state verbs from As has the feature [Δ] as an inherent property:

(89)



Since BAD takes the form *worse* in the local context of [Δ], this causes the A to take the form *worse*.[10] The Cmpr head cannot be adjoined to the A in a structure like (89), because Cmpr can only be adjoined to an A that has the feature [Δ]. The head A in (89) does not have the feature [Δ]. Therefore we will never get the form **wideren*.

Note that this has the consequence that *better* and *best* must be truly suppletive, and do not involve a stem *be(t)-* that combines with the comparative *-er* and superlative *-est* (as in, e.g., Stump 2001). If *better* included *-er*, we would expect the change-of-state verb to lack *-er*, incorrectly (*to better, *bett(en)*). This is why I analyze *better* and *worse* as involving a null realization of Δ^0: they must be nothing more than A^0, given change-of-state verbs. This analysis is further supported by the (substandard) possibility of *worser* and *bestest*, as noted above.

This analysis captures all of the facts of English comparatives, without head movement and without post-syntactic lowering. As we saw in section 2.2, syntactic operations like head movement are not sensitive

[9] I analyze Jackendoff's (2000) *smarter and smarter* versus *more and more intelligent* as involving a reduplicative morpheme that copies the prosodic word that begins with the left edge of Deg (so double marking gives *more and more dumber* and not **more dumber and more dumber*). Compare Matushansky (2013), who has no account of double marking.

[10] In section 4.5, we will see that "local context" has to mean everything dominated by the highest projection of the X^0 category in a complex X^0. So in (89), the local context of BAD is the entire V^0.

to phonology. Head movement is only sensitive to head status and syntactic category, it is blind to everything else. The analytic-synthetic alternation in comparatives has nothing to do with head movement in my analysis. What is sensitive to phonology in comparatives in this analysis is the addition of a feature to the root. Since the abstract form of the root is present from the beginning, the addition of the feature can be sensitive to its phonology. I assume that even abstract forms have phonology. The feature can then trigger merger of another head, in this case Cmpr.[11]

There is also sensitivity to semantics in comparatives, as described above. Again, this requires that the root with its semantics be present from the beginning. It is incompatible with the Distributed Morphology architecture, where semantic information is not present until a very late stage, a stage after all structure building is complete. The facts of English comparatives and superlatives show that, in fact, phonological and semantic information of roots has to be present from the very beginning. (Note that my analysis requires some lookahead, because it is only the presence of a modifier that turns some As into norm-related adjectives. This lookahead is very limited, though, restricted to the maximal projection of the adjective, and is therefore visible by inspecting the local numeration of items to be combined with the relevant head.)

An additional important point is that comparatives and superlatives illustrate the phenomenon of double marking, where both a freestanding morpheme and a bound morpheme can co-occur. As argued above, this possibility indicates that deriving bound morphemes by head movement is not the right approach.

4.3 Classical Arabic Verbal Morphology

I turn now from English to a case study involving a different language, Classical Arabic. Classical Arabic verbal subject agreement constitutes a relatively simple case where we can see the advantages of the system being proposed. In particular, we can do without fusion, fission, and other devices of the sort employed in Distributed Morphology. Classical Arabic also provides an opportunity to illustrate that the system can handle nonconcatenative morphology.

I will analyze the imperfect paradigm of Classical Arabic (see Noyer 1992, 60), given for the indicative mood below:

(90) katab *'write', imperfect indicative*

	singular	dual	plural
1	ʔ-aktub-u	n-aktub-u	n-aktub-u
2 Masc	t-aktub-u	t-aktub-aa-ni	t-aktub-uu-na
2 Fem	t-aktub-ii-na	t-aktub-na	t-aktub-na
3 Masc	y-aktub-u	y-aktub-aa-ni	y-aktub-uu-na
3 Fem	t-aktub-u	t-aktub-aa-ni	y-aktub-na

Compare this with the subjunctive:

(91) katab *'write', subjunctive*

	singular	dual	plural
1	ʔ-aktub-a	n-aktub-a	n-aktub-a
2 Masc	t-aktub-a	t-aktub-aa	t-aktub-uu
2 Fem	t-aktub-ii	t-aktub-na	t-aktub-na
3 Masc	y-aktub-a	y-aktub-aa	y-aktub-uu
3 Fem	t-aktub-u	t-aktub-aa	y-aktub-na

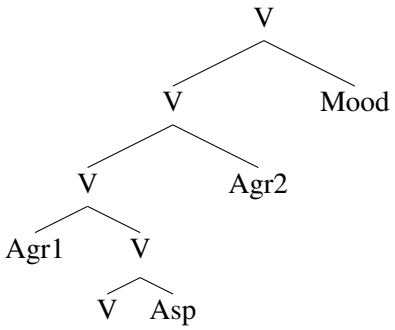
[11] Note that one could explain the unexpected existence of forms like *unhappier* as sensitivity only to the abstract root. *Unhappy* is larger than a single prosodic foot, and so should not be able to take the *-er* comparative. However, *unhappy* is a complex form and includes the A HAPPY within it, which is a single prosodic foot. If the [Δ] feature can look only at the HAPPY part, then it can be added to the A. I will leave full exploration of such a possibility to future work.

The differences between these two paradigms show clearly that the *-na* suffix that appears in the second and third person feminine non-singular forms is distinct from the *-na* that appears as a second suffix in some of the indicative forms (2nd and 3rd Masc Pl, and 2nd Fem Sg), since this second suffix is missing in the subjunctive. Note also that the first person and the second person feminine lack dual forms; instead the plural form is used for non-singular.

4.3.1 Analysis of the Affixal Morphology

I propose the following structure for the imperfect verb (to be revised slightly below):

(92)



Again, this verb is built simply by Merge, and not by head movement. It does not matter which head it occupies in the structure of the clause; that is a matter of the language-particular syntactic rules of Classical Arabic. By the Clause Matching Principle, all of the heads adjoined to V must Agree with a head in the clause. I propose that there is a matching Asp head in the clause, and a matching Mood head, but no matching Agr heads. Asp and Mood check their values against the clausal Asp and Mood heads, by Agree. I assume there is a head, say T, in the clause that Agrees with the subject and also with the Agr heads on V, checking the features of the subject against the features on those heads. This is a case of multiple exponence: both Agr heads realize features of the subject.

Asp determines the templatic morphology. For the imperfect of the first binyan, this is the stem shape aCCuC (*aktub*; the perfect is CaCaC, or *katab*). I will return below to how nonconcatenative morphology works, after analyzing the various affixes. Mood is the location of indicative versus subjunctive, and houses the *-na* that is present in the indicative but absent from the subjunctive. It is also the location of the *-u* and *-a* that appear in several of the forms in the indicative and subjunctive, respectively. Agr1 and Agr2 both agree with the subject of the verb. Agr2 clearly marks plural and feminine in most of the forms, while Agr1 seems to mostly mark person and gender. The trick is that in the first person, number is marked not in Agr2, but by having a distinct prefix for Agr1. That is, we seem to see blocking across two different morpheme "slots": the *n-* prefix blocks a plural suffix.

I propose the following lexical entries for the prefixes in Agr1, again ordered from most specified to least specified:

(93) Agr1

a. t- ↔ Agr1:[3,Fem,–Pl]

b. n- ↔ Agr1:[1,–Sg] Agr2

c. ʔ- ↔ Agr1:[1,Sg]

d. t- ↔ Agr1:[2]

e. y- ↔ Agr1

The prefix *n-* matches a span: the span of Agr1 and Agr2. They constitute a hierarchical span, since they are both included in the same X^0 (the highest V), Agr2 c-commands Agr1, and there is no head that c-commands Agr1 that does not also c-command Agr2 (see the definition of span in (67)). It does not matter that they are not linearly adjacent. The prefix *n-* will therefore be inserted into Agr1 and Agr2, and once it has been inserted nothing else will be able to be inserted in Agr2. This analysis therefore treats the prefix *n-* as a portmanteau, simultaneously realizing two hierarchically adjacent terminal nodes. This is how we get apparent blocking across terminal nodes or "slots" on the verb.

The following morphemes can be inserted into Agr2 (for purposes here I will assume that dual is [–Sg,–Pl], but this can be restated easily in a different approach, for instance the [augmented, atomic] system of Harbour 2008):

(94) Agr2

a. -ii ↔ Agr2:[2,Fem,Sg]

b. -na ↔ Agr2:[Fem,–Sg] Mood

c. -aa ↔ Agr2:[–Sg,–Pl]

d. -uu ↔ Agr2:[Pl]

Since *-na* matches the span Agr2 Mood, no morpheme can appear in Mood when it is present. *-na* is also more specified than *-aa*, so it will be inserted in the feminine dual as well as the plural (which is correct for second person but not for third; see below).

The remaining suffixes are inserted into Mood:

(95) Mood

a. -ni ↔ Mood:[Indic] / a:___

b. -na ↔ Mood:[Indic] / V:[high]___

c. -u ↔ Mood:[Indic] / C___

d. -a ↔ Mood:[Subj] / C___

One could also say that *-ni* and *-na* are the same suffix, but with dissimilation to the preceding vowel. I will leave them as stated, however.

Again, we work from the root outward. Agr1 sees morpheme insertion first, then Agr2, then Mood. Consider the first person plural. At Agr1, *n-* will match, and will match the span Agr1 Agr2. Therefore it is inserted into both Agr1 and Agr2, and nothing else can be inserted in Agr2. We move on to Mood. In the indicative, *-u* is inserted in Mood, in the subjunctive, *-a*. In contrast, in the third person masculine plural, *y-* is the only thing that can be inserted in Agr1. It cannot be inserted into the span Agr1 Agr2, so we then look for a morpheme to be inserted into Agr2. Only *-uu* matches. At Mood, *-na* will be inserted in the indicative, and nothing in the subjunctive. In the third person masculine singular, *y-* will match Agr1, nothing will match Agr2, and *-u* or *-a* will match Mood.

Note that in this account, if nothing matches, nothing occupies the node. There is simply no phonological content to the syntactic node. We saw the same thing with certain cases of English verbal morphology.

This analysis captures the blocking of the plural suffix in Agr2 by the first person plural prefix *n-* without fusion or fission or any other devices (compare Noyer 1992). It only uses insertion into spans, which is something we need anyway for portmanteau morphemes and suppletion (like *am* for BE-T/AGR in section 4.1.4). However, it appears that we cannot get away from allowing impoverishment rules. As it stands, the analysis above generates all of the correct forms except for the third person feminine dual. This analysis predicts the form should be **t-aktub-na*, since *-na* matches Agr2 and is more specific than *-aa* (they both match the same number of features, but *-na* matches an additional node). We need to somehow block *-na* from being inserted. The following impoverishment rule will have that effect:

(96) Impoverishment: In Agr2, delete [Fem] in [3,Fem,–Sg,–Pl].

With [Fem] gone, *-na* will no longer match, and *-aa* will be inserted. Note that [Fem] is not deleted from Agr1, so *t-* will still be inserted there.

While it would be nice if we could do without impoverishment rules, it does not appear to be possible. There are numerous cases where a language suddenly fails to make a contrast in certain contexts, or where a more specific morpheme fails to be inserted and a more general one is instead (as here). This is the sort of situation that is captured with impoverishment rules. Of course we want to use them as little as possible, and they will play a minimal role in all of the cases analyzed here. Note also that impoverishment is a deletion rule applying to a feature. In the analysis of the English comparative in 4.2, we had a feature addition rule. So, in general, we need to allow both feature addition and feature deletion. The latter is commonly known as impoverishment.

4.3.2 Analysis of the Nonconcatenative Morphology

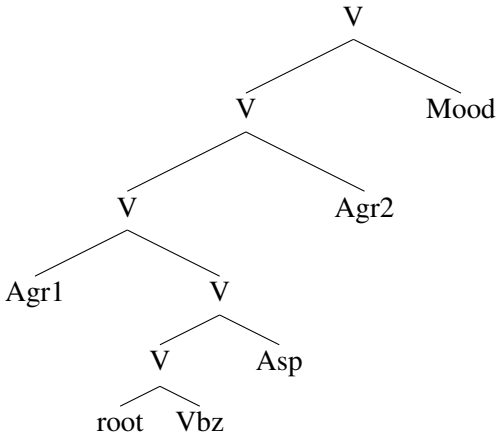
Before leaving Classical Arabic, it is important to show that this purely syntactic approach to morphology can provide a satisfactory account of the nonconcatenative aspects of Arabic morphology. To do that, we should really break the lowest V in the tree in (92) into a root plus a verbalizing morpheme. Consonantal roots can generally appear in several different forms with different meanings (including non-verbal forms). I give a few of the verbal forms that the root k-t-b can appear in in the table below, with perfect and imperfect forms (this is not an exhaustive list of the forms for this root):

(97)

verb class	perfect	imperfect	meaning
I	katab	aktub	'write'
III	kaatab	ukaatib	'correspond'
VI	takaatab	atakaatab	'write to each other'
VIII	ktatab	aktatib	'register'

The revised structure is now the following, where "Vbz" is a verbalizer (this is the one case where an acategorial root is justified; see section 2.5):

(98)



What a tree structure like this encodes is that Vbz combines with a root and produces a V as its output. Asp then combines with that V and produces another V as its output, and so on. If the heads are segmental, what they do is concatenate with the input. If they are non-segmental, what it means to apply to an input is to associate with the segmental content of that input. A head can also do both.

I assume that the verbalizing head Vbz is a consonantal template. This template may have fixed consonants and vowels, or it may just have open slots for the root consonants:

(99) Vbz

a. C-C-C ↔ [Class I]

b. CaaC-C ↔ [Class III]

c. taCaaC-C ↔ [Class VI]

d. Ct-C-C ↔ [Class VIII]

These will combine with the root k-t-b to produce k-t-b, kaat-b, takaat-b, and kt-t-b, respectively.[12]

Asp then adds a vowel melody, depending on whether it is perfect or imperfect, and depending on what the verb class is. For instance, for the imperfect of class I, it will take k-t-b and fill in the vowel melody a-u, yielding *aktub*. For the imperfect of class III, it will take kaat-b and add the melody u-i, which fills in the form as *ukaatib*. A general default is to fill in the vowel [a], but where the vowel is anchored differs from perfect to imperfect:

(100) Asp

a. a_{C1}-u ↔ [Impf] / [Class I] ___

b. u_{C1}-i ↔ [Impf] / [Class III] ___

c. a_{C1}-i ↔ [Impf] / [Class VIII] ___

d. a_{C1} ↔ [Impf]

e. $_{C1}$a ↔ [Perf]

The imperfect vowel melodies specify that the first vowel links to the left of the first consonant (indicated with the subscript C1 to the right), whereas in the perfect the first vowel of the melody links after the first consonant (indicated with a subscript C1 to the left). (Note that there are also different patterns for active and passive voice, which I am ignoring here but a complete analysis would include.)

In general, a syntactic account like the current one faces no difficulties with nonconcatenative morphology, since syntactic nodes can match either purely segmental or non-segmental material, or both. Tree structures are not particular to the concatenation of segments, they only indicate the order of combination.

4.3.3 Summary

Classical Arabic illustrated two classic morphological issues: blocking across terminal nodes or "slots" (or "rule blocks" in paradigmatic theories); and nonconcatenative morphology. This section showed that Consolidated Morphology can account for both issues with no difficulty, using only mechanisms that we need for other cases.

4.4 Armenian Nominal Declensions

In this section I show how the span-based analysis can capture the patterns of syncretism and portmanteaux in Classical Armenian discussed in Caha (2013). Using span matching, there is again no need to resort to fission or fusion or any other type of morphology-specific rule. In this case, we do not even need impoverishment. As I will show, the span-based analysis achieves all of the benefits of Caha's (2013) analysis, without the need to posit the complicated machinery of Nanosyntax and Antisymmetry (Kayne 1994) that Caha uses.

[12]Note that, by the Clause Matching Principle in (58), Vbz must Agree with a head in the clause. In Arabic, the different verb classes correlate with different semantic and syntactic processes or categories, like causative and mediopassive. I assume that Vbz Agrees with whatever head in the clause is responsible for these. In a language where verb class morphemes have no syntactic or semantic consequences (e.g., Romance languages), I assume that what the verb class morpheme would Agree with is the verb itself.

My analysis will simply follow Caha's (2013) presentation of Classical Armenian. I make no attempt to evaluate the correctness of his analytical choices. My only concern here is showing that the patterns can be captured quite elegantly with span matching.

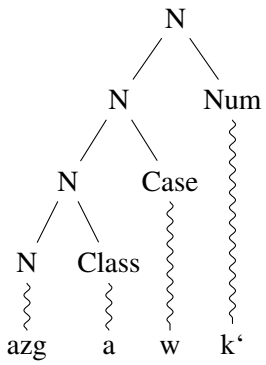
The plural paradigms of four nouns are shown below, from Caha (2013, 1044, (62)):

(101) *The plural declension in Classical Armenian*

	nation, Pl	river, Pl	word, Pl	time, Pl
Nom	azg-k‘	get-k‘	bay-k‘	žam-k‘
Acc	azg-s	get-s	bay-s	žam-s
Loc	azg-s	get-s	bay-s	žam-s
Dat	azg-a-c‘	get-o-c‘	bay-i-c‘	žam-u-c‘
Gen	azg-a-c‘	get-o-c‘	bay-i-c‘	žam-u-c‘
Abl	azg-a-c‘	get-o-c‘	bay-i-c‘	žam-u-c‘
Ins	azg-a-w-k‘	get-o-v-k‘	bay-i-w-k‘	žam-u-(w)-k‘

Along with Caha (2013), I take the maximal number of morphemes to indicate the structure of the noun. I propose that the structure is the following, exemplifying with 'nation' in the instrumental plural. "Class" is a declension class morpheme; as can be seen in the table above, the four nouns occupy different declension classes, distinguished by the vowel that appears in the Dat(ive), Gen(itive), Abl(ative), and Ins(trumental) cases.

(102)



This structure is derived purely from Merge, and not by head movement. It is not important here whether the phrasal projection of the noun includes any of these categories. In fact I can see no advantage to hypothesizing full phrasal projections for Class, Case, and Num. Class is a purely formal morpheme, with no semantic or syntactic consequences. Case is assigned to the noun depending on its syntactic context; it is entirely comparable to Agr, which I have also assumed to have no reflex in the phrasal syntax. (I assume that particular heads in the clause check Case through Agree: T checks Nom, Voice Acc, etc.) Num marks the number of the head noun, and again there is no reason to hypothesize any structure within the NP that would not be redundant with the Num head within the complex N.

In the singular, the Class vowel only appears in the instrumental case (based on Caha 2013, 1042, (58)):

(103) *The singular declension in Classical Armenian*

	nation, Sg
Nom	azg
Acc	azg
Loc	azg-i
Dat	azg-i
Gen	azg-i
Abl	azg-ê
Ins	azg-a-w

Comparison of the singular and plural also makes it clear that the *-w* suffix is a marker of Ins case, while the *-k‘*, since it appears only in the plural (and then only in the Nom and Ins), is in Num.

Caha (2013) proposes that Case is a sequence of features [A–G], such that A appears in the nominative, A and B in the accusative, A, B, and C in the Locative, and so on. Instrumental includes all of A–G:

(104) Case Features

a. Nom = [A]

b. Acc = [A,B]

c. Loc = [A,B,C]

d. Dat = [A,B,C,D]

e. Gen = [A,B,C,D,E]

f. Abl = [A,B,C,D,E,F]

g. Ins = [A,B,C,D,E,F,G]

This proposal is meant to explain patterns of syncretism, both within Classical Armenian and across languages. I will adopt this analysis from Caha (2013).[13]

The plural and singular forms now fall out from the following morpheme specifications, ordered from the N root out. Under Class, *-V* refers to the class vowel that is -a, -o, -i, or -u depending on the declension class of the noun.

(105) Class

a. -ê ↔ Class Case:[F,–G] Num:[Sg]

b. -i ↔ Class Case:[C,–G] Num:[Sg]

c. -V ↔ Class / ___ Case:[D]

(106) Case

a. -w ↔ Case:[G]

b. -c‘ ↔ Case:[D] Num:[Pl]

c. -s ↔ Case:[B] Num:[Pl]

(107) Num

a. -k‘ ↔ Num:[Pl]

As can be seen, most of the suffixes are portmanteaux, realizing more than one terminal node.

Going through the singular paradigm first, in the nominative singular (Case:[A]), nothing matches any of the nodes. Only the noun stem is spelled out. The same is true in the accusative singular (Case:[A,B]). In

[13] Caha (2013) proposes that this hierarchy of features is a syntactic hierarchy, with each feature occupying a node in a syntactic tree under Case. This is not important here, and I will simply use a flat but ordered list of features.

the locative singular (Case:[A,B,C]), however, *-i* matches, and it matches the entire span Class Case Num. Therefore *-i* is inserted into the span Class Case Num, and nothing else can be inserted in Case or Num. This is also true in the dative and genitive, since they include [C] under Case (Dat = Case:[A,B,C,D], Gen = Case:[A,B,C,D,E]). In the ablative, however, Case is [A,B,C,D,E,F]. This matches *-ê*, which is more specific than *-i*, since [F] subsumes [C]. In the instrumental (Case:[A,B,C,D,E,F,G]), *-ê* and *-i* are specified [–G], so they cannot be inserted. The only thing that matches in Class is the class vowel. This will take its form depending on what class the noun occupies; for *azg*, the vowel is *-a*. Moving on to Case, *-w* can be inserted. Nothing matches in Num. This correctly derives all of the singular forms.[14]

In the plural, nothing matches Class in Nom ([A]), Acc ([A,B]), or Loc ([A,B,C]), since *-i* is specified [Sg]. In the nominative, nothing can be inserted in Case, either. Only *-k‘* can be inserted in Num. In the accusative, however, *-s* matches Case, and it matches the span Case Num. We therefore see only the suffix *-s* and not *-k‘*. The same is true for the locative case. In the dative case, however, Case is [A,B,C,D]. The class vowel can now be inserted in Class (and it will be for every other case, as well). In Case, *-c‘* matches, and it also matches Num, so the result is *-V-c‘*. This is also true in Gen ([A,B,C,D,E]) and Abl ([A,B,C,D,E,F]). In the instrumental, however, Case is [A,B,C,D,E,F,G]. [G] is more specific than [D] or [B], since it includes [D] and [B], so *-w* is inserted. Matching a larger span only makes an entry more specific than morphemes that are equally specific *for the node currently under consideration*. Since Case is the node being considered, *-w* is more specific than either of the other two Case morphemes. Moving on to Num, since *-w* only matches Case, *-k‘* can be inserted. This correctly derives all of the plural forms presented in Caha (2013).

This is a very simple analysis that succeeds in capturing an apparently complicated system of syncretism and alternations between agglutinative and portmanteau morphemes. We do not need to posit null morphemes, and the pattern simply falls out from the lexical specifications of the inflectional morphemes. It is also not necessary to make assumptions about the phrasal syntax, as Caha (2013) does. This analysis of the N head can be combined with any proposal for the phrasal syntax of the NP or the clause.

4.5 Passamaquoddy-Maliseet

As the next case study, I will show how the theory of morphology developed here can account for a language with very complex verbal morphology. I will use Passamaquoddy-Maliseet as my example polysynthetic language, since I have some familiarity with this language and am therefore in a better position to propose a detailed analysis. Passamaquoddy-Maliseet is an Algonquian language, very similar to Potawatomi, which has served as an example language of analysis for numerous theories of morphology (e.g., Anderson 1992, Halle and Marantz 1993, Steele 1995, Stump 2001). My analysis of Passamaquoddy-Maliseet can therefore be compared with existing analyses of Potawatomi, and I will comment below on those features that have been significant in the prior literature. Verbal morphology in Passamaquoddy-Maliseet is very complicated, so simply to reduce it to manageable proportions I will provide an analysis only for a fragment, namely the independent order of regular TA and TI verbs, and then only for the negative dubitative preterite. My syntactic analysis of Passamaquoddy-Maliseet is based heavily on Bruening (2001).

The first thing to note about Passamaquoddy-Maliseet is that, while the verb can include morphemes for tense and aspect and takes different forms depending on the mood of the clause, nevertheless the verb appears to remain quite low in the clause. As was shown in section 3.1.4, the verb always follows negation, and NP arguments and other constituents can come in between negation and the verb. Negation also follows wh-phrases, which obligatorily front (to Spec-CP, I assume), and numerous argument and adjunct constituents can also come in between a wh-phrase, negation, and the verb:[15]

[14]Note that an alternative analysis would use impoverishment to remove [Sg] in Num in the environment of Case:[G], rather than negative specification for [G]; this would also prevent the first two suffixes from being inserted.

[15]I repeat the list of abbreviations here: 1 = first person; 2 = second person; 12 = first person plural inclusive; 3 = third person

(108) *Wh-phrase XP Neg XP verb*

a. Kat=op keq kt-ol-essi-w.
Neg=would something 2-thus-happen.to-Neg
'Nothing shall happen to you.' (Mitchell 1921/1976a, 11)

b. Tama ma=te wen wikuwaci-toli-hpi-w?
where Neg=Emph someone enjoy-there-eat.3-Neg
'Where does no one like to eat?' (Bruening 2001, 148, (347b))

This puts the verb fairly low. Note also the word order in the first clause of (110b), where a clausal subordinator 'because' is separated from the verb by part of the subject. This again puts the verb fairly low. I will assume that the verb raises no further than Voice, but this is not particularly important here since verb movement is irrelevant to the morphology.

4.5.1 The Verbal Morphology: The Issue of the Prefix

In the independent order in Algonquian languages, there is a prefix that indexes agreement with an argument (either the subject or the object, depending on whether the verb is direct or inverse). This prefix was mentioned in section 3.1.4. Recall that Halle and Marantz (1993) analyzed it as a pronominal clitic in CP, but the evidence in section 3.1.4 showed that it is agreement and it must be quite a bit lower than CP. For one thing, in the example in (108a), the prefix *kt-* is clearly much lower than CP, and lower even than sentential negation. There is also no evidence that it is a pronominal clitic rather than an agreement prefix. It is obligatorily present even when the argument it indexes is overt. Even a freestanding pronoun can be overt, as in the following example:

(109) Tama nil nt-i?
where 1 1-be.located
'Where am I?' (Newell 1974, 2)

Since the freestanding first person pronoun *nil* follows the wh-phrase in Spec-CP, it cannot be left-dislocated or adjoined as a hanging topic (those obligatorily precede wh-phrases; see Bruening 2001). It must be the actual subject of the verb. It is therefore clear from this example that the prefix *nt-* is neither a pronominal argument nor in CP. It is an agreement morpheme.

A complication for a simple agreement prefix analysis is that the prefix can attach to things that can be separated from the rest of the verb. These things are items typically called "preverbs" in the Algonquian literature. When one of these is present, it may be separated from the rest of the verb, as in the following examples (preverb in bold; the prefix *k-* deletes before another [k]; "=" indicates a clitic boundary; "1/2" indicates a first person subject acting on a second person object):

(110) a. (K)-**kisi** nil motewolonuwihponol-ol.
(2)-Perf 1 curse-1/2
'I've been putting a curse on you.' (Newell 1979, 16)

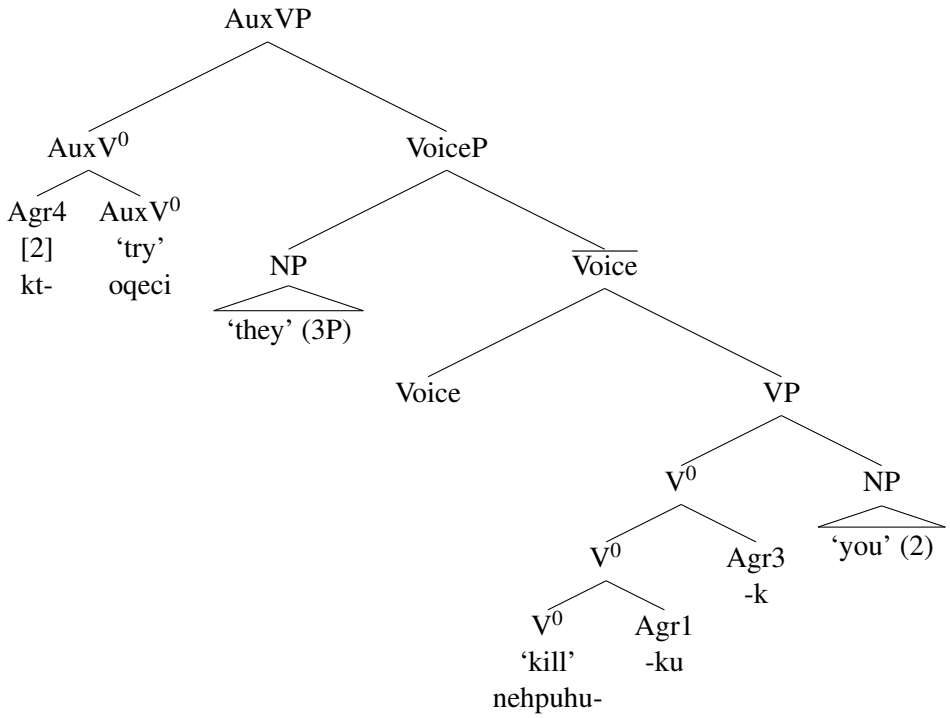
b. Ipocol msi=te k-nacitaham-ku-k skinuhsis-ok yut, kt-**oqeci**=hc nehpuhu-ku-k.
because all=Emph 2-hate-Inv-3P young.man-3P here 2-try=Fut kill-Inv-3P
'Since all the young men here hate you, they will try to kill you.' (Mitchell 1921/1976c, 12)

animate proximate or unmarked; Conj = conjunct inflection; Dir = direct voice; Dub = dubitative; Emph = emphatic particle; Fut = future; IC = initial change (ablaut); Inan = inanimate; Inv = inverse voice; Loc = locative; N = morpheme glossed "N," described in the text; Neg = negative; Obv = obviative; P = plural; Pret = preterite.

The first part of the verbal complex is the prefix, *k(t)-* in the above examples, indicating a second person. Next comes the preverb. The main verb comes later, along with all of its inflectional endings. The preverb and the rest of the verb can be separated, in these two examples by a freestanding argument pronoun and by a second-position clitic. Other types of material can also separate them. If there is no preverb, then the prefix attaches to the main verb, as in (109) and (108a) above. This apparent mobility seems to be what has led to a pronominal clitic analysis of the prefix.

I propose instead that the prefix is a simple Agr morpheme. It is like finite inflection in Indo-European languages in that it attaches to the *highest* verbal element. I propose that preverbs are a type of V, call them AuxVs for lack of a better name. Main Vs are simply Vs. Both AuxVs and Vs are types of Vs. Algonquian languages have a constraint saying that the highest element of type V has an Agr node adjoined to it on the left. I will call this Agr4, for reasons that will become apparent below. The analysis I am proposing for an AuxV (a preverb) like that in (110b) is the following:

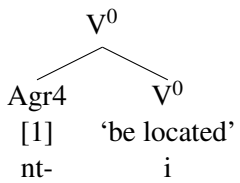
(111)



(The subject and object pronouns are null.)

I will spell out an analysis of the suffixes below, all of which adjoin to the main verb rather than the highest V. If there is no AuxV, as in (109), then Agr4 adjoins to V, since that is the highest element of type V:

(112)



The prefix only appears in *independent* forms of the verb, and does not appear in *conjunct* forms of the verb. Therefore Agr is only merged with the highest V if the clause type is appropriate. I assume that clause type is a feature of C; if C is Independent, then Agr4 must be adjoined to the highest V.

Note that some preverbs come in distinct bound versus free forms. For instance, the ability preverb has a bound form *kis-* and a free form *kisi* (the rest of the verb is underlined):

(113) a. Msi=te el-ehl-ut '-**kis**-uwehka-n.
all=Emph IC.thus-do.to-Indef/3 3-able-use-N
'All that has been done to him he can now use.' (Mitchell 1921/1976c, 15)

b. Tokec oc 'cimaciw (k)-**kisi** te=hc yali-topskans etol-amkole-k, (k)-**kisi**=hc
now Fut from.now.on (2)-able Emph=Fut around-roll IC.there-burn-IIConj (2)-able=Fut
pomaws ktahkmiku-k naka 'samaqan-ok.
live land-Loc and water-Loc
'From now on you will be able to roll in the fire, you will be able to live on land and in the water.' (Mitchell 1921/1976c, 15)

I take the bound form to be a head AbMod (for "Ability Modal") left-adjoined to the main V, which Agrees with a (null) AuxV head in the clause. The free form *kisi* is itself an AuxV, not a head adjoined to the main V.

Note that even the free forms will typically immediately precede the rest of the verb; this will only not be the case if some other constituent moves to a position between them, say adjoined to VoiceP, or it starts in Spec-VoiceP and stays there, as in (110a), or if clitics or emphatic particles disrupt them, as in (113b). The free form only has the *potential* to be separated from the rest of the verb. (I believe it also does not form a prosodic unit with the rest of the verb, although I do not have evidence to back up this subjective impression.)

4.5.2 The Suffixes on the Main Verb

The rest of the inflectional markers on the verb always appear on the main verb and are not separable from it. They are all suffixes. It is very difficult (probably impossible, given co-occurrence restrictions) to find a verb that has every possible morpheme attached, but the following example with the verb 'hit' comes close (shown here with the preverb meaning 'try'):[16]

(114)

Prefix	Preverbs	V Stem	Final	Theme	Neg	N	Central	Dub	Pret	Periph
't-	oqeci-	tok	-om	-a	-wi		-wa	-s	-opon	-il
3	try	hit	TA	Dir	Neg		3P	Dub	Pret	Obv
'they (proximate) may have tried to hit him/her (obviative)'										

The final indicates which of four classes the verb belongs to: Inanimate Intransitive or II (an intransitive verb with an inanimate subject), Animate Intransitive or AI (an intransitive verb with an animate subject), Transitive Inanimate or TI (a transitive verb with an inanimate object), or Transitive Animate or TA (a transitive verb with an animate object). These finals were described in section 3.2.1. The final in (114) makes this a TA verb (the corresponding TI is *tok-otom-*). There can also be more than one final: valence-changing morphemes can attach, for instance the reciprocal turns a TA into an AI, while an applicative suffix turns a TA into a ditransitive (see section 3.2 and Bruening 2004, 2006b).

The theme suffix indicates the grammatical roles of the agreeing arguments. The prefix and the central ending always agree with first, second, and proximate third persons, regardless of their grammatical role. The peripheral ending ("Periph" in 114) agrees with the other argument of a transitive verb (or the sole argument of an intransitive, in certain inflectional contexts). The theme suffix is direct ("Dir") if the first/second/third proximate argument is the subject, or inverse ("Inv") if it is the object. The *-a* above is the direct, making the proximate third person the subject.

[16]Passamaquoddy-Maliseet verbal paradigms reproduced here come from a draft version of Francis and Leavitt (2008). The published version of the verbal paradigms in Francis and Leavitt (2008) contains numerous errors. The draft version I am using is dated 1992.

The negative suffix always doubles a marker of sentential negation external to the verb, illustrated above in (108) and discussed in detail in section 3.1.7. It can never mark negation on its own. The slot labeled "N" is most typically filled by an allomorph of the morpheme *-(o)n(e)*, which appears in a variety of contexts. It is not clear if all of these contexts have anything in common. They include TI verbs, ditransitives, and verbs in the subordinative mode, which is used in certain types of questions, in the second clause of a conjunction, after a clause-initial particle meaning 'then', and in several other contexts. I will make no attempt to provide a detailed analysis of this suffix. We will see another morpheme that also appears in this slot in certain circumstances.

The central ending was just described. It typically marks plural agreement with first, second, and proximate third persons. The dubitative ("Dub") marks a modal category, and the preterite ("Pret") marks tense. The final suffix was also described above: it marks plural or obviative for certain arguments (those that do not agree with the prefix or the central endings).

4.5.3 Paradigms: Negative Dubitative Preterite Independent Indicative

The tables in (115) through (119) show the negative dubitative preterite independent indicative forms of the TA verb *tok-om*, 'to hit (TA)', direct, inverse, and 1-2 forms only (there are also passive forms, discussed briefly in section 3.2.2 and analyzed in section 4.5.14). No preverbs are given in the tables. These tables plus the TI verb in (120) constitute the fragment of Passamaquoddy-Maliseet verbal morphology that I will analyze here. ("1P" indicates a first person plural exclusive, "12" a first person plural inclusive, i.e., both first and second person.)

(115)

Direct forms, singular (3rd person) object										
Subject	Prefix	V Stem	Final	Theme	Neg	N	Central	Dub	Pret	Periph
1	n-	tok	-om	-a	-wi			-s	-s	
2	k-	tok	-om	-a	-wi			-s	-s	
3	'-	tok	-om	-a	-wi			-s	-opon	-il
1P	n-	tok	-om	-a	-wi		-nu	-s	-s	
12	k-	tok	-om	-a	-wi		-nu	-s	-s	
2P	k-	tok	-om	-a	-wi		-wa	-s	-s	
3P	'-	tok	-om	-a	-wi		-wa	-s	-opon	-il

(116)

Direct forms, plural (3rd person) object										
Subject	Prefix	V Stem	Final	Theme	Neg	N	Central	Dub	Pret	Periph
1	n-	tok	-om	-a	-wi			-s	-opon	-ik
2	k-	tok	-om	-a	-wi			-s	-opon	-ik
3	'-	tok	-om	-a	-wi			-s	-opon	-i(hi)
1P	n-	tok	-om	-a	-wi		-nu	-s	-opon	-ik
12	k-	tok	-om	-a	-wi		-nu	-s	-opon	-ik
2P	k-	tok	-om	-a	-wi		-wa	-s	-opon	-ik
3P	'-	tok	-om	-a	-wi		-wa	-s	-opon	-i(hi)

(117)

Inverse forms, singular (3rd person) subject										
Object	Prefix	V Stem	Final	Theme	Neg	N	Central	Dub	Pret	Periph
1	n-	tok	-om	-oku	-wi			-s	-s	
2	k-	tok	-om	-oku	-wi			-s	-s	
3	’-	tok	-om	-oku	-wi			-s	-opon	-il
1P	n-	tok	-om	-oku	-wi		-nu	-s	-s	
12	k-	tok	-om	-oku	-wi		-nu	-s	-s	
2P	k-	tok	-om	-oku	-wi		-wa	-s	-s	
3P	’-	tok	-om	-oku	-wi		-wa	-s	-opon	-il

(118)

Inverse forms, plural (3rd person) subject										
Object	Prefix	V Stem	Final	Theme	Neg	N	Central	Dub	Pret	Periph
1	n-	tok	-om	-oku	-wi			-s	-opon	-ik
2	k-	tok	-om	-oku	-wi			-s	-opon	-ik
3	’-	tok	-om	-oku	-wi			-s	-opon	-i(hi)
1P	n-	tok	-om	-oku	-wi		-nu	-s	-opon	-ik
12	k-	tok	-om	-oku	-wi		-nu	-s	-opon	-ik
2P	k-	tok	-om	-oku	-wi		-wa	-s	-opon	-ik
3P	’-	tok	-om	-oku	-wi		-wa	-s	-opon	-i(hi)

(119)

1-2 forms										
Subj/Obj	Prefix	V Stem	Final	Theme	Neg	N	Central	Dub	Pret	Periph
1/2	k-	tok	-om	-olu				-hposs		
1/2P	k-	tok	-om	-ol		-p	-a	-hposs		
1P/2(P)	k-	tok	-om	-ol		-po	-nu	-hposs		
2/1	k-	tok	-om	-i				-hposs		
2P/1	k-	tok	-om	-i		-p	-a	-hposs		
2(P)/1P	k-	tok	-om	-i		-po	-nu	-hposs		

The table in (120) shows the independent negative dubitative preterite of a TI verb (one with an inanimate object), here the verb *mici*, ‘eat’:

(120)

TI verb, plural inanimate object										
Subject	Prefix	V Stem	Final	Theme	Neg	N	Central	Dub	Pret	Periph
1	n-	mic	-i		-w	-one	-wi	-s	-opon	-il
2	k-	mic	-i		-w	-one	-wi	-s	-opon	-il
3	’-	mic	-i		-w	-one	-wi	-s	-opon	-il
1P	n-	mic	-i		-w	-one	-winu	-s	-opon	-il
12	k-	mic	-i		-w	-one	-winu	-s	-opon	-il
2P	k-	mic	-i		-w	-oni	-yawi	-s	-opon	-il
3P	’-	mic	-i		-w	-oni	-yawi	-s	-opon	-il

(In (120), if the inanimate object is singular, the peripheral ending *-il* is missing and *-s-opon* coalesces to *-ss*, as described in section 4.5.11 below.)

4.5.4 Analysis

In my analysis, there is nothing qualitatively different about a polysynthetic language like Passamaquoddy-Maliseet that separates it from a language like English. What makes Passamaquoddy-Maliseet polysynthetic

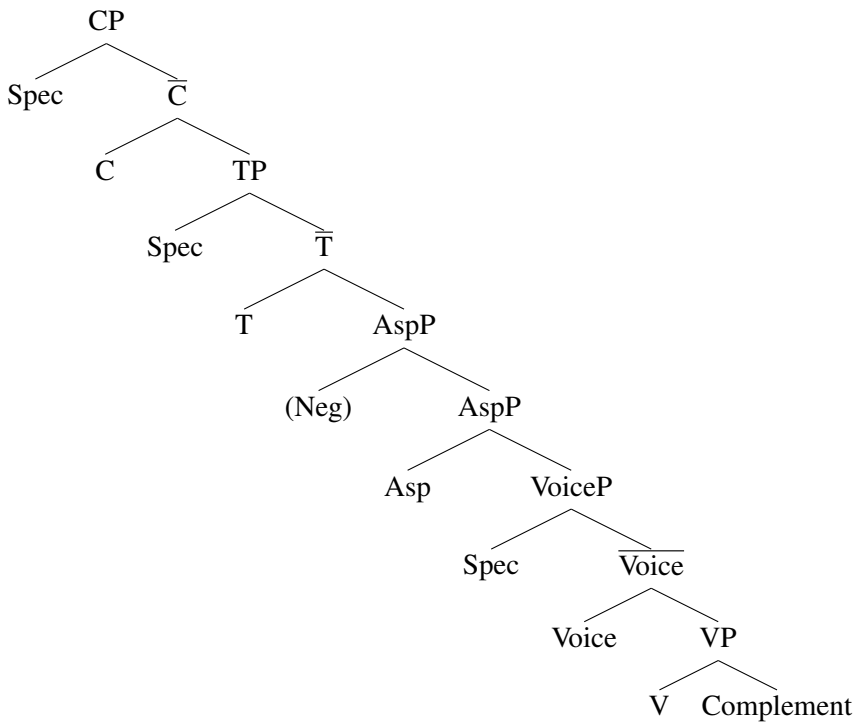
is just that it has multiple heads merged with V. Heads merged with V are also the primary indicators of clausal categories, with which they must Agree, by the Clause Matching Principle. However, note that even Passamaquoddy-Maliseet has freestanding morphemes for some clausal categories, like the second-position clitic marking future (*oc* or *hc* in the examples above), the preverbs in their free forms, sentential negation, modal particles, etc., and again we sometimes see doubling (negation). The only real difference from a language like English is that there are more Agr nodes and a few more heads like T on the verb. In my analysis, the Agr nodes are indeed agreement, and are not pronominal arguments; the presence of robust agreement permits NP arguments to be null, but when they are present they occupy argument positions (although they can quite freely reorder within the clause). In other words, I do not adopt anything like the Pronominal Argument Hypothesis (Jelinek 1984, Baker 1996, etc.). See Bruening (2001) and LeSourd (2006) for numerous reasons to reject the Pronominal Argument Hypothesis.

The clausal syntax I propose is the following: The highest head is C, which can bear various features determining clause type, like Independent versus Conjunct, and Subordinative as a sub-type of Independent (within the Conjunct, there is a Changed Conjunct and an Unchanged Conjunct). C can also bear a [Neg] feature if the clause is negative, as described in section 4.1.6 for English. C[Neg] Agrees with both a freestanding negative particle and a Neg morpheme on the verb. I will assume that the freestanding negative particle is adjoined to AspP. Wh-phrases move to Spec-CP.

Between C and Asp is a head that plays a very important role in the agreement system of Algonquian languages. This head is described in detail in section 4.5.7. I will identify it with the head T. Briefly, T Agrees with all NP arguments that are first, second, or third proximate person, and attracts them to its specifier(s). It also Agrees with multiple Agr heads on the verb, so that the verb indicates the features of these arguments and their grammatical roles. It also case-licenses the arguments it Agrees with, and marks them as case-licensed. Arguments that it did not Agree with and mark are then Agreed with by a different clausal head, namely, Asp.

Below Asp is Voice, and then V. The structure of the clause is shown in tree form below, for the active voice:

(121)



In the passive, I assume that there is a head Pass above Voice, which forces Voice not to project its specifier

(see section 3.2.1).

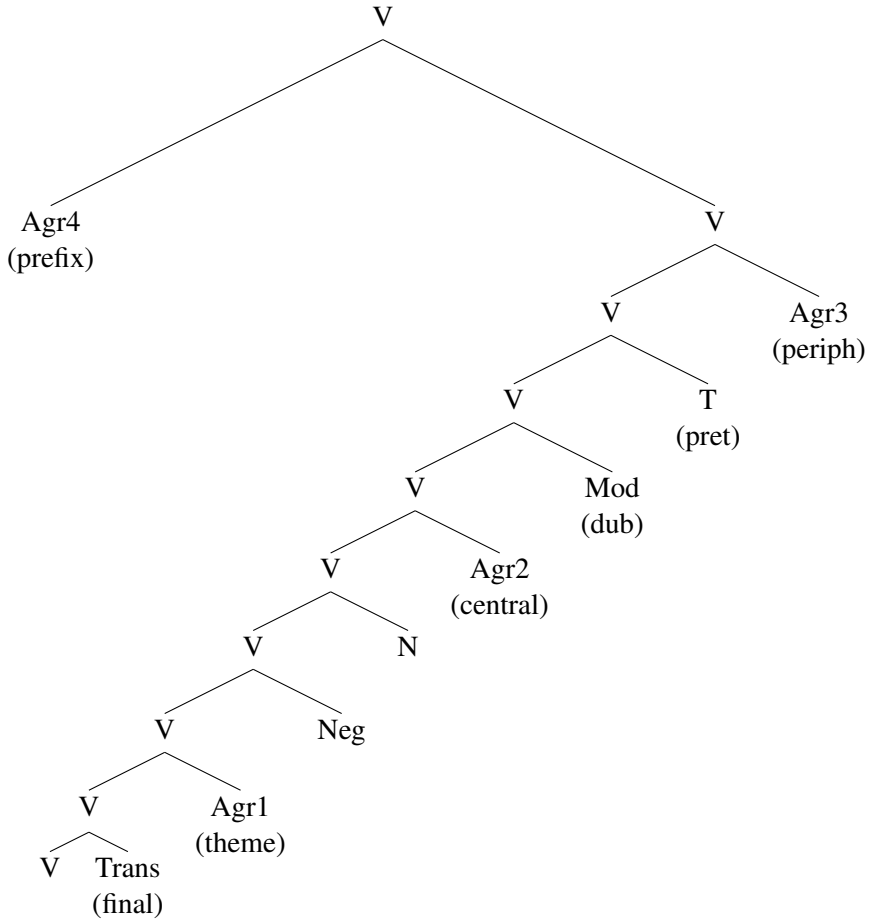
These clausal heads enter into various Agree relations with other elements in the clause, and with terminal nodes adjoined to the verb. These Agree relations are described in detail below. I summarize them briefly here. First, T and Asp Agree with arguments and then with agreement morphemes on the verb. T also Agrees with Pass(ive) if it is present and can Agree in that feature with a terminal node on the verb. The head Pass, if present, may also Agree with other terminal nodes on the verb. Voice and V Agree with a morpheme on the verb (the final). C[Neg] Agrees with a Neg morpheme on the verb. C also Agrees with other morphemes on the verb, in features involving clause type, like [Sub(ordinative)]. A clausal Mod(al) head agrees with a modal morpheme on the verb.

The structure of the verb is very complex, with multiple heads adjoined to V. By the Clause Matching Principle, every one of these heads must Agree with a clausal head. These Agree relations are discussed in much more detail below.

4.5.5 The Structure of the Verb

I propose that the verb stem is merged with various heads, as depicted below for the case where the main verb is the highest verb, so that the prefix (Agr4) attaches to it:

(122)



Not all of these heads adjoin to every verb. For instance, Agr1 only adjoins to V if it immediately c-commands a Trans head with the features [+Trans,+Animate], otherwise it is absent. I will assume that Neg only adjoins to V if C is [Neg]. In principle, Neg may just optionally adjoin, but the constraint that C[Neg] must Agree with a Neg head on the verb forces it to be there in a negative clause, and the Clause Matching

Principle blocks it from appearing in a positive clause. I will also assume that Mod and T can simply be absent if the clause is not of the relevant type (again, they are optional). As stated above, Agr4 only adjoins to the highest V in certain types of clauses (Independent ones). I will assume that the other Agr nodes are always present, but often nothing will be inserted into them because nothing matches the relevant features.

4.5.6 Trans (the Finals)

Starting closest to the root, Trans (for "(in)transitive"; the final) checks its values against V and Voice. It has a feature [±Trans] that it checks against Voice. Voice will have the feature [+Trans] if it selects a verb that selects an NP object and selects an NP to project in its own specifier, otherwise it will have the feature [–Trans]. In addition to the [trans] feature, Trans also has the feature [±Anim(ate)]. It will seek to check this feature first against V, based on which value of NP V selects as its object. If V does not select an object, then it will Agree with Voice, checking the feature based on which value of NP Voice selects as its specifier. Note that Trans cannot be Agreeing directly with an NP, because the NP that is selected might never be projected. For instance, as noted in section 3.2, reciprocal verbs are derived by affixing a reciprocal morpheme onto a verb with a TA final. This turns the verb into an intransitive, such that the verb's object is never projected. Yet the TA final still appears, indexed for the animacy of the NP that the verb would have taken if the reciprocal morpheme had not suppressed it. Therefore the animacy value of Trans must be based on the selectional properties of V and Voice, not the NP that is actually projected (see section 3.2.4).

Trans will be inserted with values for [±Trans,±Anim], which it checks as just described. The combinations of these features give us the four classes of verbs:

(123) Trans (finals)

a. [–Trans,+Anim]: AI

b. [–Trans,–Anim]: II

c. [+Trans,+Anim]: TA

d. [+Trans,–Anim]: TI

The actual form that is inserted depends on the verb root; there is a set of AI morphemes, and each will have to be specified for which roots it attaches to. Ditto for the others. I give the entries for the two finals we see in the examples above:[17]

(124) Trans (finals)

a. -om ↔ [+Trans,+Anim] / {TOK,...}___

b. -i ↔ [+Trans] / {MIC,...}___

4.5.7 Agr1 (the Theme Sign)

Moving on to Agr1, this is the theme sign. This head is only merged with the verb if it immediately c-commands a Trans head with the features [+Trans,+Anim]. Otherwise, Agr1 is simply not merged with V. So, Agr1 is missing with all intransitive verbs and with TI verbs. It will also be missing if the reciprocal morpheme attaches to a verb with a TA final, since then Agr1 will not immediately c-command a [+Trans,+Anim] Trans head (the reciprocal comes outside Trans).[18]

[17] I treat inanimate forms as simply not imposing any selectional restrictions based on animacy. This is because the applicative morpheme always attaches outside a TI stem, but the lowest object in an applicative can be either animate or inanimate. This means that TIs are simply not specified for animacy (TIs also appear with CP objects, which I assume are not specified for animacy).

[18] The applicative morpheme I will assume to be a second Trans head, so Agr1 will adjoin outside of it. I assume that in such a case, the first Trans head Agrees with V and with the next head up, Appl. It will be [+Trans], because both select an NP. It will not

If it is merged, Agr1 will be inserted with certain features, which it will check against a head in the clause. At this point we need some understanding of the syntax of Passamaquoddy-Maliseet. Bruening (2001, 2009a) shows that in the inverse, the object moves across the subject to a higher position. First and second persons always move to this higher position (whether they are subjects or objects), while third person animates may. The proximate-obviative distinction follows hierarchy: proximate NPs c-command obviative ones. So, in the inverse, where the object moves across the subject and ends up c-commanding it, the object is proximate; in the direct, this movement does not happen, and the subject is higher and therefore proximate. Let us call the higher position Spec-TP, and the head that is involved in the movement T. T Agrees with and attracts first and second person subjects and objects. If neither subject nor object is first/second person, then T must Agree with and attract one of the subject or object. It cannot Agree with an inanimate, so if either the subject or the object is inanimate, it must Agree with the other one (and it is not possible for both to be inanimate). Otherwise, it can Agree with either the subject or the object (but not both). T then checks the features of the NPs that it Agreed with against Agr1. These features include a feature marking which projection the Agreed-with NP started in (Voice versus V). In the independent order, the morphemes that can match Agr1 are the following:

(125) Agr1 (theme signs, to be revised)

a. -i- ↔ [2Voice, 1V]
(second person subject, first person object)

b. -ol(u)- ↔ [1Voice, 2V]
(first person subject, second person object)

c. -oku- ↔ [V]
(T Agreed with an object, so, inverse)

d. -a- ↔ [ ]
(default, appears in direct)

As stated above, Agr1 is simply not merged with the V if it would not immediately c-command a [+Trans,+An] Trans head. This means it is simply missing in all intransitive and TI forms.

4.5.8 Neg

Neg will be realized only if the clause is negative. As in English, I assume that a negative clause has a [Neg] feature on C. In Passamaquoddy-Maliseet, C with a [Neg] feature must Agree with a freestanding particle high in the clause. I will assume that this particle occurs adjoined to AspP, but the exact location is not important, it just needs to be higher than the final position of the verb (which I am assuming is Voice). Proximate NPs also typically precede the freestanding negative particle, so I locate it below Spec-TP. A Neg head also has to be adjoined to the main verb when C is [Neg], and this Neg head Agrees with C[Neg]. The two allomorphs of the Neg head that we see in the data above are the following:

(126) Neg

a. Ø ↔ [Neg] / [1,2]__[Pret]

b. w(i) ↔ [Neg]

Note that Neg is only null in a negative environment in the 1-2 forms *of the preterite only*. This requires a conditioning environment that includes more than just adjacent heads. The preterite without the dubi-

be [+Anim], because the V does not impose any animacy requirement on its object in such a case. The first Trans head will then be spelled out as a TI. The second Trans head will then Agree with Appl and with the next head up, Voice. I will assume that a Trans that Agrees with Voice and with Appl is always spelled out in the same way, as the applicative morpheme (*-uw* or *-a*).

tative also has a zero form for Neg (but a special form for Pret), so it is not Dub that is the conditioning environment:

(127)

1-2 forms, preterite (non-dubitative)										
Subj/Obj	Prefix	V Stem	Final	Theme	Neg	N	Central	Dub	Pret	Periph
1/2	k-	tok	-om	-olu					-hqopon	
1/2P	k-	tok	-om	-ol		-p	-a		-hqopon	
1P/2(P)	k-	tok	-om	-ol		-po	-nu		-hqopon	
2/1	k-	tok	-om	-i					-hqopon	
2P/1	k-	tok	-om	-i		-p	-a		-hqopon	
2(P)/1P	k-	tok	-om	-i		-po	-nu		-hqopon	

The features [1,2] are part of the conditioning environment for Neg, so the central endings (Agr2) might be involved (because they reflect these features, see below), but N does not bear any of the conditioning features. This means that Neg takes its form based on a head that is separated from it by at least two intervening heads (N and Dub), and we are going to have to allow non-local contextual allomorphy, where the conditioning feature is not on an adjacent head. I will simply assume that this is true, and that in principle, any feature within a complex X^0 can potentially trigger contextual allomorphy for any head dominated by that X^0.[19]

4.5.9 N

As for the N suffix, I do not have a complete analysis to propose at this point. I will simply assume that in certain clausal configurations, some head or combination of heads in the clause checks a [+N] feature against N by Agree. One of the environments for this is the subordinative, not shown but mentioned again below, and another is with TI verbs, as with *mici-* in (120). I assume that in the subordinative case, C Agrees with N in [+N]. In the TI case, I assume that Asp Agrees with N in [+N] if it case-licenses an inanimate argument (this also happens in a TA inverse if the logical subject is inanimate, as this analysis would predict). The morphemes that occupy N in the forms above are the following:

(128) N (to be revised)

a. -one ↔ [+N]

b. -p ↔ [ ] / ___[1,2,P]

The suffix *-p* realizes N, although it is not specified [+N]. This means that it will always be pre-empted by *-one* when N is [+N]. It is also limited to appearing in plural 1-2 forms. Note that *-one* turns into *-oni* before *-ya(wi)*. The *w* of the suffix *-wa* deletes following *-p*. A schwa (written *o*) is inserted between *-p* and *-nu*.

4.5.10 Agr2 (Central Endings)

Agr2 (the central ending) is straightforward, given the syntax described above for Agr1. The head T described there takes the features of all the arguments it Agreed with, without regard to their grammatical role,

[19] Merchant (2015) proposes that only adjacent *spans* can condition contextual allomorphy, but his own vocabulary entry in his example (23a), page 284, violates this and has a non-adjacent span triggering allomorphy. Other examples of non-adjacent conditioning have been given in the literature, for instance Swahili (Stump 2001, 139–144) and Potawatomi (Halle and Marantz 1993, 154–157). The latter is discussed briefly below.

Note that another possible analysis for these Passamaquoddy-Maliseet forms with a zero negative morpheme and a distinct form for Pret is to say that the negative morpheme is in a different location. The allomorphs of the preterite look like they might include a negative morpheme initially. In some other forms, the Neg suffix before a [p] is *-h*, just like the dubitative preterite 1-2 forms. In some other forms (e.g., some conjunct forms), the Neg suffix is *-hq*, like the beginning of the (non-dubitative) preterite 1-2 forms. One might analyze these 1-2 preterite forms as having Neg exceptionally follow the central endings, rather than occupy its usual position. At this point, it is not clear why this change in order would take place, so I do not pursue this analysis further here.

and checks them against Agr2. In cases where both the subject and the object are first and second person, this means that all the features of both NPs will be present on Agr2. The morphemes that can match Agr2 are the following:

(129) Agr2 (central endings)

a. -winu ↔ [1P] / [Neg]___[+N]

b. -nu ↔ [1P]

c. -yawi ↔ [P] / [Neg]___[+N]

d. -wi ↔ [Sg] / [Neg]___[+N]

e. -wa ↔ [P]

As stated above, the *w* of *-wa* deletes following *-p*.

4.5.11 Mod and T

Mod and T check their values against clausal Mod and T heads, in the values [+Dub] and [+Pret], respectively. Mod and T can be realized by the following morphemes:

(130) Mod

a. -hposs ↔ Mod:[+Dub] T:[+Pret] / [Neg] [1,2]___

b. -s ↔ [+Dub]

(131) T

a. -hqopon ↔ [+Pret] / [Neg] [1,2] [–Dub]___

b. -opon ↔ [+Pret]

The morpheme *-hposs* is a portmanteau, matching the span Mod T, but only in negative 1-2 forms. The preterite *-opon* coalesces with the dubitative *-s* to *-ss* when it is final in the verb. Note that Passamaquoddy-Maliseet has a widespread process of final truncation; this seems to be an instance of that general phenomenon.[20]

4.5.12 Agr3 (Peripheral Ending)

As stated above, Agr3 (the peripheral ending) marks agreement with the NP that does not Agree with T. I will assume that T checks off or somehow marks the NPs that it Agrees with, for instance, by checking their Case values. A different head, which I will assume is Asp, Agrees with any remaining NP that it c-commands and that does not have its Case feature checked. Asp then checks its features against the features on Agr3. (As noted above, Asp also Agrees with N in [+N] if the argument it Agrees with is inanimate.) The following are the Agr3 morphemes:

(132) Agr3 (peripheral endings)

a. -i(hi) ↔ [ObvP]

b. -ik ↔ [3P]

c. -il ↔ [InanP]

d. -il ↔ [Obv]

[20] I treat *-hqopon* here as an instance of T, conditioned by a non-dubitative environment. An alternative is that it is also a portmanteau, like *-hposs*, and realizes the span Mod (unspecified) T:[+Pret] in a negative [1,2] environment.

The inanimate plural and the obviative singular are historically two different morphemes. They have no features in common, and we do not want to make them a default, since neither appears with inanimate singulars or 3rd person proximate singulars. Note also that the initial vowel of all of these suffixes actually varies according to preceding vowels; it just happens to be *i* in all the forms considered here. The obviative plural also includes a suprasegmental, a low pitch accent, and in many forms the low pitch accent is the only reflex of that suffix (because of final truncation).

4.5.13 Agr4 (the Prefix)

Finally, we come to the prefix, Agr4. As stated above, Agr4 agrees with the same NPs that Agr2 does. Like Agr2, it checks its features against the head T. The following are the three prefixes:

(133) Agr4 (prefix)
- a. n- ↔ [1,–2]
- b. k- ↔ [2]
- c. ’- ↔ [3]

These prefixes also have allomorphs *nt-, kt-, ’t-*, when the prefix is adjacent to a vowel.

This accounts for all of the forms shown in the paradigms in section 4.5.3.

4.5.14 The Passive

I discussed the passive in Passamaquoddy-Maliseet in section 3.2.2. I now show how the analysis proposed here for the Passamaquoddy-Maliseet verbal morphology can accommodate the facts of the passive.

Recall that with TA verbs, the passive is marked in Agr1, the theme sign. With a third person logical object, the theme sign is the Direct, but the verb inflects like an intransitive rather than a transitive, lacking the prefix and peripheral ending:

(134) Ipa, wot pesq psk-uw-**a**.
well, Dem one find-TransAn-**3.Pass**
‘Just one of them was found.’ (Newell 1979, 20)

With first or second person logical objects, a unique allomorph of the theme sign appears:

(135) ma te nt-ok-om-**oke**-w
Neg Emph 1-hit-TransAn-**Pass**-Neg
‘I am not hit’

With other verbs (not TA), the passive is instead marked by the presence of the N morpheme:

(136) ma te op-i-w-**one**-hpon (ma te op-i-wi-hpon)
Neg Emph sit-IntransAn-Neg-**Pass**-Pret (Neg Emph sit-IntransAn-Neg-Pret)
‘there was not sitting’ (‘he did not sit’)

(137) ma te pun-omu-w-**one**-hpon (ma te ’-pun-omu-w-on-ihpon)
Neg Emph put-TransInan-Neg-**Pass**-Pret (Neg Emph 3-put-TransInan-Neg-N-Pret)
‘it was not put (there)’ (‘he/she did not put it (there)’)

We therefore need to amend the entries for the Agr1 and N heads. The following is the revised list of Agr1 morphemes:

(138) Agr1 (theme signs, revised)

a. -i- ↔ [2Voice, 1V]
(second person subject, first person object)

b. -ol(u)- ↔ [1Voice, 2V]
(first person subject, second person object)

c. -oke- ↔ [SAPV, Pass]
(first or second person object of passive)

d. -oku- ↔ [V]
(T Agreed with an object, so, active inverse)

e. -a- ↔ [ ]
(default: direct, and passive of third person)

"SAP" stands for "Speech Act Participant" and is a feature that subsumes first and second persons. So *-oke-* will appear when either first or second person was the object of V and Agreed with T. However, this only happens in the passive voice, not the active.

To account for this, we need to amend how the head T works. Recall that this head attracts certain arguments to its specifier. It also Agrees with them, and then Agrees with Agr1 in those features and also in a feature recording where the moved argument started. Let us suppose that T also records whether the Pass head is present in the clause or not, by Agreeing with it if it is present. It will then have a feature [Pass] if Pass is present. Then T can also Agree with Agr1 in the feature [Pass]. This is indicated in the entry for *-oke-*, which is limited to the passive. The other entries are unspecified, and so in principle could appear in either the passive or the active (but *-i-* and *-ol(u)-* cannot appear in the passive, since they require both a subject and an object).

The reason *-oku-* does not appear in the passive with a third person but *-a-* does has to do with how the head T works. Recall that it Agrees preferentially with first and second person arguments. If there are none, then it Agrees with a third person. However, it can only Agree with a third person if there is more than one third person argument. One way to look at this is that T institutes a search: it scans in its sister for a first or second person. If the first NP it encounters, in Spec-VoiceP, is third person instead, it records that fact but does not yet Agree with it, instead it continues to search. If the object is first or second person, it will Agree with it and attract it to its specifier. It will not Agree with the third person that it encountered first. If the second NP it finds is also not first or second person, search will stop and it will choose which of the two third persons it encountered to Agree with. If it only ever finds one third person, it will move on, but if it reaches the edge of a certain local domain (the local phase boundary, say, in the phase theory of Chomsky 2000) without finding another NP, then the search will terminate and T will simply fail to Agree.

This means that when the object of a passive verb is third person, the head T will not Agree with any arguments. VoiceP has its argument suppressed by Pass. T will only find one NP, and if it is third person, search will move on and then terminate at the end of the local phase. T will fail to Agree. There will then be no features in Agr1, and only the default Agr1 morpheme will match. The prefix (Agr4) will then also be missing, because it will also lack features, and there is no default for the prefixes (see 133). (The sole NP will then Agree with Asp, since it was not case-licensed by T, and it will therefore be indexed in Agr3 if it is plural.)

As for the passive of intransitives and TI forms, Agr1 is never merged with these forms. The passive has to be signaled somewhere else. It is indicated by the presence of the N morpheme, *-on(e)*. This is the same morpheme that marks the subordinative mode. The difference is that the subordinative will have a prefix; compare the following to (136) and (137):

(139) ma te **'t**-op-**i**-w-**one**-hpon
Neg Emph 3-sit-**IntransAn**-Neg-**Pass**-Pret

'he or she didn't sit' (subordinative)

(140) ma te **'**-pun-**omu**-w-**one**-wihpon
Neg Emph put-**TransInan**-Neg-**Pass**-Pret
'he or she did not put it (there)' (subordinative)

(The preterite has a special form following *-one* and yet another special form in the negative.)

Again, I do not have a complete analysis of the subordinative to propose. The head T has to be forced to Agree with the sole argument of an intransitive in the subordinative, so that the prefix will appear. I assume that C[Sub] somehow forces T to do this. This will not take place in the passive, however. Indeed, in the passive subordinative, a special morpheme appears in the N head instead (and no Neg morpheme appears):

(141) ma te op-**i**-**moc**
Neg Emph sit-**IntransAn**-**Pass.Sub**
'there was not sitting' (subordinative)

(142) ma te pun-**om**-**moc**
Neg Emph put-**TransInan**-**Pass.Sub**
'it was not put (there)' (subordinative)

In the passive, I propose that the Pass head Agrees first with Trans and then with the head N. If Trans is [+Trans] and [+Anim], Pass will not Agree with N. Otherwise, it will mark the N head [+N, Pass]. This will trigger insertion of the morpheme *-one*. Since T does not Agree with anything (see above), no prefix will appear in Agr4. The subordinative also causes N to be [+N]. I proposed above that the head that is responsible for the subordinative is C. C[Sub] then Agrees with N in both [+N] and [Sub]. We now need a new entry for N for when the verb is both passive and subordinative:

(143) N (revised)
a. -moc ↔ [+N, Pass, Sub]
b. -one ↔ [+N]
c. -p ↔ [ ] / ___[1,2,P]

This accounts for all of the passive forms we have seen here, where there is no dedicated morpheme in the verb for the passive. The passive is marked through morphemes that perform other functions. It is therefore not straightforwardly compatible with the head movement analysis, instead it supports the view here according to which morphemes on the verb are not heads in the clausal syntax. Instead, they are merged directly with the V head, and have to match heads in the clausal syntax, through Agree. However, they can Agree with multiple heads, or one single clausal head can Agree with multiple morphemes on the verb, or the features of a clausal head can have effects on different morphemes in different contexts (as in the passive in Passamaquoddy-Maliseet).

4.5.15 Summary

This analysis accounts for all of the forms in the tables above, as well as some others introduced throughout the book. There are of course numerous forms not accounted for here, but I do not believe any of them raise any difficulties beyond simply listing more forms and their conditioning environments. The only tricky issues were (1) conditioning by a non-local feature, in the form of Neg; and (2) the complicated pattern of the passive, which required multiple Agree relations between clausal heads and terminal nodes on the verb. Even with these complications, we do not need any mechanisms beyond those already described for the other case studies. We do need an account of the syntax of Passamaquoddy-Maliseet, and I spelled out

the bare minimum that is necessary to account for the agreement patterns. Much more relevant detail can be found in Bruening (2001, 2006a, 2008, 2009a).

In an attempt to help clarify the complicated Agree relations needed for the account of Passamaquoddy-Maliseet, I summarize them here:

(144) Agree relations in Passamaquoddy-Maliseet:

a. Trans Agrees with V and Voice, as well as Pass if present.

b. Agr1 Agrees with T, in features that T checked against certain NPs and against Pass if present.

c. Neg Agrees with C[Neg].

d. N Agrees with C[Sub], with Asp (in features checked against an NP), and Pass if present and Trans is not [+Trans,+Anim].

e. Agr2 Agrees with T, in features that T checked against certain NPs.

f. Mod Agrees with a clausal Mod head.

g. T Agrees with the clausal T head (in [+Pret]).

h. Agr3 Agrees with Asp, in features that Asp checked against certain NPs.

i. Agr4 Agrees with T, in features that T checked against certain NPs.

The passive is signaled in Agr1 or in N, depending on the features checked in the Agree relations involved (in Agr1 if [+Trans,+Anim], in N otherwise).

I turn now to two issues that have been important in the morphology literature in Potawatomi and other Algonquian languages.

4.5.16 Issue 1: Ordering Relations Among the Prefixes

One of the prominent issues in the morphology literature on Potawatomi and other Algonquian languages has been the ordering relation among the prefixes. In the 1-2 forms, Agr4 has the features of both the subject and the object. These features can therefore include both first and second person. If a second person is present, however, the prefix is always *k-*, and never *n-*. If *n-* only realizes first person and *k-* only realizes second person, it is not clear why the latter would always take precedence over the former, since neither is more highly specified than the other. We also cannot say that second person always takes precedence over first person in Algonquian languages, because in Agr2, the central endings, the opposite ordering occurs: if there is a first person plural, it always beats out any other plural ending.

In my analysis, this is not an issue at all: *n-* is specified as being specifically non-second person. This will block it from appearing in any form with a second person argument, by the Subset Principle. It just seems to be true that the *n-* is specifically reserved for first person exclusive of second person. This can be seen in the freestanding pronouns, too. They are given below:

(145)

	Sg	Pl
1	nil	nilun (exclusive)
		kilun (inclusive)
2	kil	kiluwaw
3	nekom	nekomaw

As can be seen, forms with *n-* are reserved for first person exclusive of second person. Forms with *k-* go with any second person, including first person plural inclusive. This makes *k-* more general and less specific.

Notice also that the two first person plural pronouns share an ending, while the two plural pronouns that do not include first person share a different ending. This is just like the central endings (Agr2) in the verb. The relative ranking of these endings as well as the central endings (Agr2) also follows in my analysis, in

this case just from the Elsewhere Condition. The endings that are specified [1P] are more specific than the endings that are only specified [P]. As can be seen, the latter appear in both second and third person plurals, so they are more general and therefore less specific.

4.5.17 Issue 2: Nonlocal Conditioning of Allomorphy

Another issue addressed by prior analyses of Potawatomi is that, in Potawatomi, first person plural subject forms in Agr2 (the central endings) block the appearance of plural endings in Agr3 (the peripheral endings), even across an intervening preterite suffix (see especially Halle and Marantz 1993, 154–157 and Stump 2001, 82). This does not happen in Passamaquoddy-Maliseet, but we do see something similar in [+Pret] T conditioning the form of Neg across the intervening span N Agr2 Mod. It appears that we simply need contextual allomorphy being conditioned by a non-local head (see note 19).

There is also something similar to the Potawatomi case in Passamaquoddy-Maliseet. In Passamaquoddy-Maliseet, the Agr3 (peripheral) endings disappear in the subordinative mode of the independent order. A full syntactic analysis would try to explain why this is so, but for present purposes I will simply stipulate that in the syntactic contexts where the subordinative mode is required, all features in Agr3 are deleted (alternatively, the whole Agr3 node is deleted or even never merged). At the same time, the N head is marked [+N], and must be spelled out (note that it is not the N head being spelled out that deletes Agr3, since in non-subordinative forms of TI verbs, N is spelled out but Agr3 is still present, as in 120). In some of the previous case studies, we also had to make use of feature deletion. This is such a widespread phenomenon, any theory of morphology is going to have to recognize a mechanism of deletion (*aka* impoverishment).

4.6 Summary

In this chapter, I have gone through various case studies to show how the theory works. The theory can capture both concatenative and nonconcatenative morphology. It captures alternations between agglutinating forms and portmanteau forms. It can capture the relatively impoverished morphology of English as well as the complex polysynthetic verbal morphology of Passamaquoddy-Maliseet. It does so with no morphology-specific mechanisms. It uses only the syntactic devices of Merge and Agree, as well as feature addition and deletion. The system also does not use head movement to put together complex heads, since using that mechanism for the formation of complex heads is problematic. In particular, we have seen that doubling is widespread, which is not expected on a head movement account, and the actual morphological form of a verb does not depend on what position it occupies in the syntax. Capturing doubling is one of the goals of this approach and it is one of the things that distinguishes it from other syntactic accounts. In most other syntactic accounts, there is just one syntactic head that is a freestanding morpheme when no head movement takes place and a bound morpheme when head movement does take place. These accounts stumble when there is both a freestanding morpheme and a bound one, a pattern that is quite common. We also saw a case where the passive is spelled out on different morphemes depending on the context, something that is incompatible with the view that complex verbs are put together by head movement through dedicated clausal heads.

Chapter 5

Syntactic versus Paradigmatic Theories

Consolidated Morphology is a purely syntactic theory of morphology. In fact, there is no difference between morphology and syntax, instead there is only one component of grammar, the morphosyntax. I have shown that we can have a very minimal theory, with no morphology-specific devices.

Up to now the primary point of comparison for Consolidated Morphology has been Distributed Morphology, the most prominent syntactic theory of morphology. There are other approaches to morphology, however, many of which strictly separate morphology from syntax. The most prominent approach of this type is the paradigmatic theory of morphology, as represented by, for instance, Stump (2001). Proponents of paradigmatic theories of morphology have criticized purely syntactic theories like the one developed here on various grounds. In this chapter, I show that these criticisms are without force, and in fact purely syntactic theories like Consolidated Morphology (and Consolidated Morphology in particular) are superior.

One phenomenon that can be dismissed immediately as a problem is the phenomenon of extended exponence. I have already shown numerous examples here where some morphosyntactic features are realized by multiple morphemes, and provided accounts of them. We can also dismiss cumulative exponence (portmanteaux) and zero exponence as problematic, since these have also been accounted for. Meaningless morphemes like verb conjugation class morphemes are also not a problem, since in the current theory morphemes on nouns are not matched by anything in the clause, and in the verb, meaningless morphemes match the verb itself (see note 12). The criticisms in Spencer (2001) and elsewhere based on these phenomena are therefore entirely without force.

Stump (2001) criticizes Distributed Morphology and theories like it for having to distinguish between concatenative and nonconcatenative morphology. I have already shown how the current theory can handle nonconcatenative morphology, in the discussion of Classical Arabic in section 4.3. Stump is more concerned with cases like English *sing-sang*, though. In Halle and Marantz's (1993) analysis of this alternation, there are two distinct processes at work in *sang*: (1) there is a zero morpheme indicating past tense, and (2) this zero morpheme triggers a (nonconcatenative) stem readjustment rule. According to Stump, in this analysis it is a "grand coincidence" (p10) that zero morphemes happen to be associated with readjustment rules. However, Halle and Marantz (1993) already showed that the two are distinct: there can be zero morphemes without readjustment rules (*hit-hit*), and there can be overt morphemes with readjustment rules (*keep-kept*). Even the regular, default past tense morpheme can trigger a readjustment rule (*sell-sold*). There is no "grand coincidence," since it is simply not true that it is all and only zero morphemes that trigger stem changes. (If there is any tendency in that direction, it is probably because speakers prefer that a distinction be marked in some way, and redundant marking is slightly dispreferred to non-redundant marking.)

Stump (2001) also criticizes Distributed Morphology for making a distinction between "content" features and "context" features. The content features are the features a morpheme realizes, while the context features are ones that determine contextual allomorphy (e.g., /-t/ realizes past tense as a content feature, but

only in the context of certain stems). The current theory also makes this distinction. In Stump's paradigmatic theory, there is no such distinction. However, that is because there is no featural coherence to rule blocks in Stump's theory. The rules are organized into blocks, roughly corresponding to the syntactic nodes of the current theory, but this organization is entirely arbitrary, and any rule in any block can refer to any of the features of the entire word. The paradigmatic theory is actually less restrictive and explanatory on this score. There is no reason in this theory that particular rule blocks tend to refer to only a coherent subset of the features of a word. It is purely an accident that people are generally able to recognize morphemes as markers of subject agreement or object agreement or tense or aspect. Since people generally do recognize such morphemes across the languages of the world, the paradigmatic theory is missing something important about morphology. In other words, the cost of not making the distinction between content and context features is far too high.[1]

Moreover, even though Stump (2001) formalizes his paradigmatic theory so that it makes no distinction between content and context features, he informally refers throughout his book to morphemes in blocks as realizing categories like agreement and tense (e.g., "position III is occupied by tense prefixes... position IV is occupied by subject-agreement prefixes," page 139). He even suggests (page 166) that the blocks might be ordered according to a universal hierarchy of those categories. If he were to actually formalize this suggestion and this informal way of speaking, his theory too would have to recognize a distinction between content and context features.[2]

Other authors have claimed that there are phenomena that a purely syntactic theory cannot handle. For instance, Becker (1993) goes through several different types of examples that he claims necessitate a theory of morphology that relates forms to other forms that they do not include syntactically. For instance, Becker claims that there are numerous cases in different languages like *fasc-ist*, *fasc-ism* where there is a relation between two different affixes: *-ist* can attach to whatever stem *-ism* can, with the meaning, 'a proponent of STEM-ism'. The claim is that we need to relate *-ist* to *-ism* in the theory of morphology, and it would not be good enough to allow each independently to appear in the same environments.

However, it is simply not true that such affixes always attach to the same stems. In English, at least, there are *-ism* forms with no corresponding *-ist* form, like *neologism, truism, spoonerism*. There are also *-ism* forms that have a different form for the meaning that would be taken by the corresponding *-ist*, like *liberalism, liberal*. There are also *-ist* forms without a corresponding *-ism* form, like *geologist*. It does not seem that we would be missing anything by simply assigning partially overlapping environments to *-ism* and *-ist*, and stating no formal relationship between them.

Even where there does seem to be a fairly regular correspondence, it is not clear that it is the job of a theory of morphology to capture this. Consider the German forms with *ein-* ('in') and *aus-* ('out') that Becker discusses. According to Becker, any verb that can be prefixed with one can be prefixed with the other, and the resulting two forms will generally be antonyms. However, no one thinks that antonymy should be part of the theory of morphology. It is true that speech errors, word association, and so on reveal that morphemes are stored in the human mind in complex networks of associations. These include the relation of antonymy. Thus, English speakers know that *put down* and *pick up* are antonyms. However, no morphologist would design a theory of morphology to capture this relation, since the two phrases have nothing in common morphologically (morphology is, after all, about *form*). Similarly, *sun* and *moon* are known to be related in the lexical network, but again no theory of morphology would state that relation. If *ein-* and *aus-* are antonyms, it is not the job of a theory of morphology to state that. The theory of lexical relations and networks is what should state it. If a speaker hears a form *ein-V*, they can probably guess with

[1] In addition, Stump (2001, chapter 6) introduces a notion of stem indexing and stem selection rules in order to choose the right stem form for a given morphosyntactic context. This looks identical to a context feature.

[2] Stump (2001) also criticizes syntactic theories for assigning hierarchical structure to words. This criticism is just bizarre, though, since Stump's own theory has an ordered set of rule blocks, with the output of one rule block forming the input to the next rule block. This is exactly equivalent to a hierarchical tree structure.

some high degree of certainty that there will be an antonym *aus-V*, but this does not need to be stated in a theory of morphology, and probably should not be. All that the theory of morphology should state is what *ein-* can attach to and (separately) what *aus-* can attach to; the theory of lexical relations and the organization of the lexicon will state that they are antonyms, and capture the relation between them.

Becker (1993) makes a similar mistake in discussing compounds. He claims that compounds like *firewoman* are formed not from *fire* and *woman*, but by analogy with *fireman*. According to Becker, "the constituents of *firewoman* do not motivate the compound" (p13). This is just false. Of course they do. Compounds only specify a very vague relation between the head and the non-head constituent. It is up to speakers to decide on a conventional understanding of what the particular meaning of a given compound is. A *firewoman* could be a woman made of fire, a woman who delivers fire, a woman who lives in fire, a woman who tends fires, a woman who controls fire, a woman from a group whose emblem is fire, and numerous other things, just like a *fireman*. If speakers decide to conventionalize the meaning of *firewoman* as analogous to the meaning of *fireman*, they can do so, but again it is not the business of a theory of morphology to account for that. All that a theory of morphology should account for is the fact that *fire* and *woman* can be put together, and when they are, there is some vague relation between the two. How the resulting compound is conventionalized, and why someone chose to create it in the first place, are not part of morphology.

Other cases of analogy that Becker discusses involve diachronic change. It is quite likely that analogy does play a role in historical change. However, once again it is not necessary for a theory of morphology to capture this. Analogy probably does play a role in human cognition, and this can have effects on historical change without analogy being a formal part of a synchronic theory of morphology. Of course we want our morphological analyses of specific phenomena to be compatible with historical changes and help to understand those changes where possible, but when speakers decide to generalize one stem shape rather than another, for instance, it is not necessary that a theory of morphology explain why that happened.

To summarize, criticisms of syntactic theories are generally off the mark. Many are plagued by a misunderstanding of what a theory of morphology is, and what belongs in it and what does not. Others are simply without force, since syntactic accounts face no difficulty in accounting for the phenomena. Syntactic theories do better than paradigmatic theories by actually having a theory of syntax. In the case studies here, I spelled out analyses of clausal syntax, agreement, case assignment, and so on. In general, paradigmatic theories have nothing to say about syntax. They also posit entirely arbitrary structure for morphological forms, precisely because they have no theory of syntax. Their theories of morphology also include numerous devices that are specific to morphology (in fact, all of them), again because they have no theory of syntax. In contrast, Consolidated Morphology has *no* devices that are particular to morphology. All theoretical devices are those of the phrasal syntax. Finally, paradigmatic theories also presuppose that there is such a thing as a morphological word in terms of which a paradigm can be defined, but this is false, as Haspelmath (2011) argues forcefully. I conclude that syntactic theories in fact fare better than paradigmatic theories.

Chapter 6

Conclusion

This work has proposed a new theory of morphology within a framework where there is only a single component of grammar for assembling both words and phrases. In this theory, there is in fact no notion of "word." There are syntactic units—features, X^0s, and XPs—and prosodic units, and principles that relate the two. Complex X^0s are put together not by head movement, but by Merge. Heads on verbs generally match clausal heads against which they check their features, but the verb itself can occupy any head in the clause, depending on the language, the clause type, and even the verb type (main versus auxiliary, in English).

This theory does without the complicated architecture and mechanisms of Distributed Morphology. There is no level of Morphological Structure, and there are no purely morphological mechanisms like fission, fusion, and local dislocation. There is only the morphosyntax, and there are morphemes that are inserted into terminal nodes, but these are inserted as complex syntactic elements are put together. All phonological, semantic, and syntactic information is present from early on, and stored items can include complex structure as well as phonological and semantic information. The various case studies gone through here have shown that the theory enables simple accounts of numerous phenomena, including nonconcatenative morphology, alternations between agglutinating and synthetic forms, alternations between analytic and synthetic forms, and such perennial problems as English *do*-support and comparatives.

I have also addressed arguments against syntactic theories that proponents of paradigmatic theories have offered, and shown that they have no force. Unlike paradigmatic theories, which have a separate system of morphology with its own principles and no theory of syntax, I have offered a theory of both syntax and morphology, with only a single component and only a limited number of mechanisms. None of these mechanisms is particular to morphology. Not only is the theory of morphology in Consolidated Morphology simpler than Distributed Morphology, its chief competitor among purely syntactic theories, it is also much simpler than non-syntactic theories, which have distinct syntax and morphology components. Since it is simpler than all such theories, and has no morphology-specific devices, it is to be preferred.

Looking forward, there is still much work to be done. One of the main issues left unresolved here was whether there is any truth to the Mirror Principle. The available typological work indicates that there is not, but obviously we need much more extensive investigation of the empirical facts in the world's languages. I believe that there are no ordering principles relating morpheme order to the order of functional heads in the clause, but there may be tendencies. If there are any such tendencies, they will need to be explained. I suggest that they follow from psycholinguistic and historical factors, if they do exist. For instance, it is often suggested that morphemes on verbs derive historically from freestanding elements that gradually lose their phonological independence. If this is correct, then we expect there to be some relation between the position of the freestanding source morpheme and the resulting bound morpheme.

There are also numerous morphological phenomena within the world's languages that I have not attempted to analyze here, since I have been able to focus only on a small number of case studies. These

include instances of variable affix ordering (e.g., Fula in Stump 2001); inflection appearing inside a complex stem or even more than once (e.g., Breton diminutives, in Stump 2001); and numerous others. I anticipate that these will yield to insightful analysis using the mechanisms of Consolidated Morphology.

Finally, this work presented analyses where derivations proceed bottom-up and root-out, as in traditional syntactic and morphological analyses. However, I actually think that the morphosyntax proceeds left-to-right, not bottom-up. See Phillips (1996, 2003), Richards (1999), Bruening (2010, 2014a). I believe that rethinking analyses in these terms will produce many benefits and important insights, but I will have to leave it to future work to explore these benefits.

One advantage of a left-to-right model is that it is better able to interface with a model of performance, since the order of the derivation is the same as the order of production and perception. Future work should be able to unite the morphosyntactic theory here with accounts of lexical access, speech errors (e.g., Pfau 2009), and other aspects of performance.

Bibliography

Anderson, Stephen R. (1992), *A-Morphous Morphology*. Cambridge: Cambridge University Press.

Baker, C. L. (1991), "The Syntax of English *Not*: The Limits of Core Grammar." *Linguistic Inquiry* 22: 387–429.

Baker, Mark (1985), "The Mirror Principle and Morphosyntactic Explanation." *Linguistic Inquiry* 16: 373–415.

Baker, Mark C. (1988), *Incorporation: A Theory of Grammatical Function Changing*. Chicago: University of Chicago Press.

Baker, Mark C. (1996), *The Polysynthesis Parameter*. New York and Oxford: Oxford University Press.

Becker, Thomas (1993), "Back-Formation, Cross-Formation, and 'Bracketing Paradoxes' in Paradigmatic Morphology." In Geert Booij and Jaap van Marle, eds., *Yearbook of Morphology*, Dordrecht: Foris, pp. 1–25.

Bentzen, Kristine (2007), *Order and Structure in Embedded Clauses in Northern Norwegian*. Ph.D. thesis, University of Tromsø.

Bobaljik, Jonathan David (2002), "Realizing Germanic Inflection: Why Morphology Does Not Drive Syntax." *Journal of Comparative Germanic Linguistics* 6: 129–167.

Bobaljik, Jonathan David (2012), *Universals in Comparative Morphology*. Cambridge, MA: MIT Press.

Borer, Hagit (2005), *Structuring Sense Volume I: In Name Only*. New York: Oxford University Press.

Bresnan, Joan, and Lioba Moshi (1990), "Object Asymmetries in Comparative Bantu Syntax." *Linguistic Inquiry* 21: 147–185.

Bruening, Benjamin (2001), *Syntax at the Edge: Cross-Clausal Phenomena and The Syntax of Passamaquoddy*. Ph.D. thesis, MIT. Distributed by MIT Working Papers in Linguistics, Cambridge, MA.

Bruening, Benjamin (2004), "Verbal Reciprocals." In Torgrim Solstad, Benjamin Lyngfelt, and Maria Filiouchkina Krave, eds., *Demoting the Agent: Passive and Other Voice-Related Phenomena*, Oslo: University of Oslo, pp. 3–12.

Bruening, Benjamin (2006a), "Differences between the Wh-Scope-Marking and Wh-Copy Constructions in Passamaquoddy." *Linguistic Inquiry* 37: 25–49.

Bruening, Benjamin (2006b), "The Morphosyntax and Semantics of Verbal Reciprocals." Ms., University of Delaware.

Bruening, Benjamin (2008), "Quantification in Passamaquoddy." In Lisa Matthewson, ed., *Quantification: A Cross-Linguistic Perspective*, Bingley, UK: Emerald, pp. 67–103.

Bruening, Benjamin (2009a), "Algonquian Languages Have A-Movement and A-Agreement." *Linguistic Inquiry* 40: 427–445.

Bruening, Benjamin (2009b), "Selectional Asymmetries between CP and DP Suggest that the DP Hypothesis is Wrong." In Laurel MacKenzie, ed., *U. Penn Working Papers in Linguistics 15.1: Proceedings of the 32nd Annual Penn Linguistics Colloquium*, Philadelphia: University of Pennsylvania Working Papers in Linguistics, pp. 26–35. Available at http://repository.upenn.edu/pwpl/vol15/iss1/.

Bruening, Benjamin (2010), "Language-Particular Syntactic Rules and Constraints: English Locative Inversion and *Do*-Support." *Language* 86: 43–84.

Bruening, Benjamin (2013), "By-Phrases in Passives and Nominals." *Syntax* 16: 1–41.

Bruening, Benjamin (2014a), "Precede-and-Command Revisited." *Language* 90: 342–388.

Bruening, Benjamin (2014b), "Word Formation is Syntactic: Adjectival Passives in English." *Natural Language and Linguistic Theory* 32: 363–422.

Bruening, Benjamin (2017a), "The Lexicalist Hypothesis: Both Wrong and Superfluous." *Language* to appear: x.

Bruening, Benjamin (2017b), "Subject Auxiliary Inversion." In Martin Everaert and Henk van Riemsdijk, eds., *The Wiley Blackwell Companion to Syntax*, Oxford: Wiley, second ed., p. to appear.

Bruening, Benjamin (2017c), "Syntactic Constraints on Idioms (Do Not Include Locality)." In Claire Halpert, Hadas Kotek, and Coppe van Urk, eds., *A Pesky Set: Papers for David Pesetsky*, Cambridge, MA: MIT Working Papers in Linguistics, p. chapter 8.

Bruening, Benjamin, Xuyen Dinh, and Lan Kim (2016), "Selection, Idioms, and the Structure of Nominal Phrases with and without Classifiers." Ms., University of Delaware and Penn State.

Bruening, Benjamin, and Thuan Tran (2015), "The Nature of the Passive, with an Analysis of Vietnamese." *Lingua* 165: 133–172.

Caha, Pavel (2013), "Explaining the Structure of Case Paradigms by the Mechanisms of Nanosyntax: The Classical Armenian Nominal Declension." *Natural Language and Linguistic Theory* 31: 1015–1066.

Chomsky, Noam (1957), *Syntactic Structures*. The Hague: Mouton.

Chomsky, Noam (1981), *Lectures on Government and Binding*. Dordrecht: Foris.

Chomsky, Noam (1993), "A Minimalist Program for Linguistic Theory." In Kenneth Hale and Samuel Jay Keyser, eds., *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, Cambridge, MA: MIT Press, pp. 1–52.

Chomsky, Noam (2000), "Minimalist Inquiries: The Framework." In Roger Martin, David Michaels, and Juan Uriagereka, eds., *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, Cambridge, MA: MIT Press, pp. 89–155.

Corver, Norbert (1997), "*Much*-Support as a Last Resort." *Linguistic Inquiry* 28: 119–164.

Dalrymple, Mary, Sam Mchombo, and Stanley Peters (1994), "Semantic Similarities and Syntactic Contrasts between Chichewa and English Reciprocals." *Linguistic Inquiry* 25: 145–163.

Di Sciullo, Anna-Maria, and Edwin Williams (1987), *On the Definition of Word*. Cambridge, MA: MIT Press.

Embick, David (2007), "Blocking Effects and Analytic/Synthetic Alternations." *Natural Language and Linguistic Theory* 25: 1–37.

Embick, David (2010), *Localism versus Globalism in Morphology and Phonology*. Cambridge, MA: MT Press.

Embick, David, and Alec Marantz (2008), "Architecture and Blocking." *Linguistic Inquiry* 39: 1–53.

Embick, David, and Rolf Noyer (2001), "Movement Operations after Syntax." *Linguistic Inquiry* 32: 555–595.

Francis, David A., and Robert M. Leavitt (1995), "The Indian Devil, Mischief-Maker." In Brian Swann, ed., *Coming to Light: Contemporary Translations of the Native Literatures of North America*, New York: Random House, pp. 503–518.

Francis, David A., and Robert M. Leavitt (2008), *Peskotomuhkati Wolastoqewi Latuwewakon A Passamaquoddy-Maliseet Dictionary*. Orono, Maine: The University of Main Press.

Grimshaw, Jane (2005), "Extended Projection." In Jane Grimshaw, ed., *Words and Structure*, Stanford: CSLI Publications, pp. 1–73. Originally circulated as a manuscript in 1991.

Haeberli, Eric, and Tabea Ihsane (2016), "Revisiting the Loss of Verb Movement in the History of English." *Natural Language and Linguistic Theory* 34: 497–542.

Hale, Kenneth, and Samuel Jay Keyser (1993), "On Argument Structure and the Lexical Expression of Syntactic Relations." In Kenneth Hale and Samuel Jay Keyser, eds., *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, Cambridge, MA: MIT Press, pp. 53–109.

Halle, Morris, and Alec Marantz (1993), "Distributed Morphology and the Pieces of Inflection." In Kenneth Hale and Samuel Jay Keyser, eds., *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, Cambridge, MA: MIT Press, pp. 111–176.

Hankamer, Jorge, and Line Mikkelsen (2005), "When Movement Must Be Blocked: A Reply to Embick and Noyer." *Linguistic Inquiry* 36: 85–125.

Harbour, Daniel (2008), *Morphosemantic Number: From Kiowa Noun Classes to UG Number Features*. Dordrecht: Springer.

Harbour, Daniel (2016), "Parameters of Poor Pronoun Systems." *Linguistic Inquiry* 47: 706–722.

Harley, Heidi (2013), "External Arguments and the Mirror Principle: On the Distinctness of Voice and v." *Lingua* 125: 34–57.

Harley, Heidi (2014), "On the Identity of Roots." *Theoretical Linguistics* 40: 225–276.

Harris, Alice C. (2017), *Multiple Exponence*. Oxford: Oxford University Press.

Haspelmath, Martin (2011), "The Indeterminacy of Word Segmentation and the Nature of Morphology and Syntax." *Folia Linguistica* 45: 31–80.

Heim, Irene, Howard Lasnik, and Robert May (1991), "Reciprocity and Plurality." *Linguistic Inquiry* 22: 63–101.

Heycock, Caroline, Antonella Sorace, and Zakaris Svabo Hansen (2010), "T-to-I and V2 in Subordinate Clauses: An Investigation of Faroese in Relation to Icelandic and Danish." *Journal of Comparative Germanic Linguistics* 13: 61–97.

Heycock, Caroline, and John D. Sundquist (2017), "Don't Rush to Rehabilitate: A Remark on Koeneman and Zeijlstra 2014." *Linguistic Inquiry* 48: 173–179.

Hyman, Larry M. (2003), "Suffix Ordering in Bantu: A Morphocentric Approach." *Yearbook of Morphology* 2002: 245–281.

Jackendoff, Ray S. (2000), "Curiouser and Curiouser." *Snippets* 1: 8.

Jackendoff, Ray S. (2002), *Foundations of Language: Brain, Meaning, Grammar, Evolution*. Oxford and New York: Oxford University Press.

Jelinek, Eloise (1984), "Empty Categories, Case, and Configurationality." *Natural Language and Linguistic Theory* 2: 39–76.

Julien, Marit (2002), *Syntactic Heads and Word Formation*. Oxford: Oxford University Press.

Kayne, Richard (1994), *The Antisymmetry of Syntax*. Cambridge, MA: MIT Press.

Kiparsky, Paul (1973), ""Elsewhere" in Phonology." In Stephen R. Anderson and Paul Kiparsky, eds., *A Festschrift for Morris Halle*, New York: Holt Rinehart, pp. 93–106.

Kobele, Gregory M. (2012), "Idioms and Extended Transducers." In *Proceedings of the 11th International Workshop on Tree Adjoining Grammars and Related Formalisms (TAG+11)*, Paris, France, pp. 153–161.

Koeneman, Olaf, and Hedde Zeiljstra (2014), "The Rich Agreement Hypothesis Rehabilitated." *Linguistic Inquiry* 45: 571–615.

Kratzer, Angelika (1996), "Severing the External Argument from Its Verb." In John Rooryck and Laurie Zaring, eds., *Phrase Structure and the Lexicon*, Dordrecht: Kluwer, pp. 109–137.

Lasnik, Howard (2000), Syntactic Structures *Revisited: Contemporary Lectures on Classic Transformational Theory*. Cambridge, MA: MIT Press.

Leavitt, Robert M., and David A. Francis (1990), *Wapapi Akonutomakonol: The Wampum Records*. Fredericton: Micmac-Maliseet Institute, University of New Brunswick.

LeSourd, Philip S. (2006), "Problems for the Pronominal Argument Hypothesis in Maliseet-Passamaquoddy." *Language* 82: 486–514.

Lieber, Rochelle (1988), "Phrasal Compounds in English and the Morphology-Syntax Interface." In *CLS 24: Papers from the Parasession on Agreement in Grammatical Theory*, Chicago: Chicago Linguistic Society, pp. 202–222.

Lieber, Rochelle (1992), *Deconstructing Morphology: Word Formation in Syntactic Theory*. Chicago and London: The University of Chicago Press.

Marantz, Alec (1993), "Implications of Asymmetries in Double Object Constructions." In Sam A. Mchombo, ed., *Theoretical Aspects of Bantu Grammar*, Stanford: CSLI Publications, pp. 113–150.

Marantz, Alec (1997), "No Escape from Syntax: Don't Try Morphological Analysis in the Privacy of Your Own Lexicon." In Alexis Dimitriadis, Laura Siegel, Clarissa Surek-Clark, and Alexander Williams, eds., *Proceedings of the 21st Annual Penn Linguistics Colloquium*, no. 4:2 in Penn Working Papers in Linguistics, Philadelphia: University of Pennsylvania.

Marantz, Alec (2007), "Phases and Words." In Sook-Hee Choe, ed., *Phases in the Theory of Grammar*, Seoul: Dong In, pp. 199–222.

Matushansky, Ora (2013), "More or Better: On the Derivation of Synthetic Comparatives and Superlatives in English." In Ora Matushansky and Alec Marantz, eds., *Distributed Morphology Today: Morphemes for Morris Halle*, Cambridge, MA: MIT Press, pp. 59–78.

Merchant, Jason (2015), "How Much Context Is Enough? Two Cases of Span-Conditioned Stem Allomorphy." *Linguistic Inquiry* 46: 273–303.

Mitchell, Lewis (1921/1976a), *Koluskap naka 'Siwiyi/Oqim/Wocawson ('Koluskap and His Relatives/Loon/Wind')*. Indian Township, Maine: Wabnaki Bilingual Education Program. Edited and updated version of text in J. D. Prince (1921), "Passamaquoddy Texts," Volume X of the Publications of the American Ethnological Society.

Mitchell, Lewis (1921/1976b), *Koluskap Nekotok Skitkomiq ('When Koluskap Left the Earth')*. Indian Township, Maine: Wabnaki Bilingual Education Program. Edited and updated version of text in J. D. Prince (1921), "Passamaquoddy Texts," Volume X of the Publications of the American Ethnological Society.

Mitchell, Lewis (1921/1976c), *Mikcic ('Turtle')*. Indian Township, Maine: Wabnaki Bilingual Education Program. Edited and updated version of text in J. D. Prince (1921), "Passamaquoddy Texts," Volume X of the Publications of the American Ethnological Society.

Newell, Irene (1979), *Kehtaqs ('Ghost Stories')*. Indian Township, Maine: Wabnaki Bilingual Education Program.

Newell, Wayne (1974), *Kukec*. Indian Township, Maine: Wabnaki Bilingual Education Program.

Noyer, Robert Rolf (1992), *Features, Positions and Affixes in Autonomous Morphological Structure*. Ph.D. thesis, Massachusetts Institute of Technology. Distributed by MIT Working Papers in Linguistics, Cambridge, Mass.

Payne, John (1985), "Negation." In Timothy Shopen, ed., *Language Typology and Syntactic Description, Volume 1: Clause Structure*, Cambridge: Cambridge University Press, pp. 197–242.

Pfau, Roland (2009), *Grammar as Processor: A Distributed Morphology Account of Spontaneous Speech Errors*. Amsterdam/Philadelphia: John Benjamins.

Phillips, Colin (1996), *Order and Structure*. Ph.D. thesis, Massachusetts Institute of Technology. Distributed by MIT Working Papers in Linguistics, Cambridge, Mass.

Phillips, Colin (2003), "Linear Order and Constituency." *Linguistic Inquiry* 34: 37–90.

Platzack, Christer (1986), "COMP, INFL, and Germanic Word Order." In Lars Hellan and Kirsti Koch Christensen, eds., *Topics in Scandinavian Syntax*, Dordrecht: Reidel, pp. 185–234.

Pollard, Carl, and Ivan A. Sag (1994), *Head-Driven Phrase Structure Grammar*. Chicago: Chicago University Press.

Pollock, Jean-Yves (1989), "Verb Movement, Universal Grammar, and the Structure of IP." *Linguistic Inquiry* 20: 365–424.

Pullum, Geoffrey K. (1982), "Syncategorematicity and English Infinitival *to*." *Glossa* 16: 191–215.

Pylkkänen, Liina (2008), *Introducing Arguments*. Cambridge, MA: MIT Press.

Rice, Keren (2000), *Morpheme Order and Semantic Scope: Word Formation in the Athapaskan Verb*. Cambridge: Cambridge University Press.

Richards, Norvin (1999), "Dependency Formation and Directionality of Tree Construction." In Vivian Lin, Cornelia Krause, Benjamin Bruening, and Karlos Arregi, eds., *Papers on Morphology and Syntax, Cycle Two*, Cambridge, MA: MITWPL, vol. 34 of *MIT Working Papers in Linguistics*, pp. 67–105.

Rizzi, Luigi (1990), *Relativized Minimality*. Cambridge, MA: MIT Press.

Sadock, Jerrold M. (1980), "Noun Incorporation in Greenlandic: A Case of Syntactic Word Formation." *Language* 56: 300–319.

Safir, Ken, and Mamadou Bassene (2017), "Morphosyntax and Movement: Verb Stems in Jóola Eegimaa." *Natural Language and Linguistic Theory* 35: 839–897.

Spencer, Andrew (1988), "Bracketing Paradoxes and the English Lexicon." *Language* 64: 663–682.

Spencer, Andrew (2001), "The Paradigm-Based Model of Morphosyntax." *Transactions of the Philological Society* 99: 279–313.

Sproat, Richard (1985), *On Deriving the Lexicon*. Ph.D. thesis, Massachusetts Institute of Technology.

Steele, Susan (1995), "Towards a Theory of Morphological Information." *Language* 71: 260–309.

Stump, Gregory T., ed. (2001), *Inflectional Morphology: A Theory of Paradigm Structure*. Cambridge: Cambridge University Press.

Vikner, Sten (1995), *Verb Movement and Expletive Subjects in the Germanic Languages*. Oxford: Oxford University Press.

Williams, Edwin (1981), "On the Notions 'Lexically Related' and 'Head of a Word'." *Linguistic Inquiry* 12: 245–274.

Williams, Edwin (2007), "Dumping Lexicalism." In Gillian Ramchand and Charles Reiss, eds., *The Oxford Handbook of Linguistic Interfaces*, Oxford: Oxford University Press, pp. 353–381.

Zanuttini, Raffaella (1997), *Negation and Clausal Structure: A Comparative Study of Romance Languages*. Oxford: Oxford University Press.

Zwicky, Arnold M. (1969), "Phonological Constraints in Syntactic Descriptions." *Papers in Linguistics* 1: 411–463.

Zwicky, Arnold M., and Geoffrey K. Pullum (1983), "Cliticization vs. Inflection: English *n't*." *Language* 59: 502–513.