Chapter 1 Introduction: Of Parameters and Polysynthesis

Languages differ. There is no doubt that the morphological and syntactic structure of Mohawk, Nahuatl, and Nunggubuyu looks quite unlike that of English, French, and German. However, the true nature and extent of these differences is an important and controversial question. This is arguably one of the most important empirical questions that linguists can address, the answer having a variety of philosophical, sociological, and practical implications.

A priori, there are two extreme positions one can take toward the superficial differences among languages. On the one hand, it could be that (say) Mohawk actually differs from (say) English in many, many minor ways, and it is the cumulative effect of all these little differences that makes Mohawk seem so alien to an English speaker. The other approach would be to say that Mohawk differs from English in one essential one way, but this difference is so deeply embedded in the grammatical system that it affects all kinds of linguistic structures. Which view is the correct one--or perhaps what mixture or intermediate position between the two extremes--is a central concern of linguistic theory.

Edward Sapir apparently considered the answer to this question to be obvious. He began his well-known introduction to what would now be called linguistic typology with the following words: “For it must be obvious to any one who has thought about the question at all or who has felt something of the spirit of a foreign language that there is such a thing as a basic plan, a certain cut, to each language. This type or plan or structural “genius” of the language is something much more fundamental, much more pervasive, than any single feature of it that we can mention, nor can we gain an adequate idea of its nature by a mere recital of the sundry facts that make up the grammar of the language (Sapir 1921:120).” Here Sapir expresses the view that the distinctive properties of different languages have something in common: they are specific realizations of some overall “plan”. By using such terminology, Sapir seems to have in mind something
which is both characteristic of the language in question and conceptually unified. Moreover, he assumes that this is clear to all who have adequate experience with language.

Interestingly, Sapir’s view is not obvious to many contemporary linguists. On the contrary, it is implicitly or explicitly denied in much current work. This is particularly true of those who adopt some version of Chomsky’s “Principles and Parameters” (P&P) framework, but it holds of others as well. From this, it seems one can draw one of three logically possible conclusions: (1) contemporary generative linguists have not thought about the question at all; (2) contemporary generative linguists have not felt anything of the spirit of a foreign language; (3) Sapir was wrong. This book proposes to study this question in some detail, using as a case in point the class of “polysynthetic” languages (as defined below) in general, with special emphasis on the Mohawk language.

Specifically, I defend the view that Mohawk and similar languages have a single property that distinguishes them from other language types and that influences the form of virtually every sentence of the language. Thus, Sapir was right in an important sense in saying that languages have a “structural genius”. To the extent that this has been missed by many linguists, we can be accused of “not having felt the spirit of a foreign language”—even when we know a large number of important and intricate things about the language. On the other hand, Sapir was wrong at least to the extent of saying that this is obvious. Indeed we will see that certain factors that make the basic plan of a language far from obvious. Nevertheless, the tools and techniques of current generative linguistic theory allow one to be much more precise and explicit about the structural genius of polysynthetic languages than Sapir could be, thereby showing how that genius shapes the sentences that one observes in texts or conversations.

Why use Mohawk in particular to study this question? A short answer is simply that if one wanted to pick a language whose morphosyntax seemed as different as possible from that of English (the best-studied language of the world, at least in generative terms), Mohawk would be as good a choice as any and better than most. A somewhat more sophisticated version of this answer flows out of the informal typological terms which linguists often use in their preliminary characterizations of languages. First, there is a sense that some languages are syntactically-oriented while others are morphologically-oriented. Within the more morphologically oriented languages, one can identify two types: ‘head-marking’ languages and ‘dependent-marking’ languages, to use Nichols’ (1986) term. Roughly speaking, head-marking languages are those which make extensive use of agreement morphology on (say) the verb to express linguistic relationships, while dependent marking languages use Case morphology on noun phrases to express comparable relationships. On the other hand, inspired by Greenburg (1963) linguists often categorize languages as being head initial (i.e. SVO or VSO), head-final (SOV), or having free word order. Moreover, there are some rough correlations between these two typological schemes. It is well-known that head-final languages generally have well-developed systems of grammatical Case—i.e. they are dependent-marking languages. Head-marking languages, on the other hand, very often have free word order, with dependents either preceding or following the head (Nichols 1992:ch. 3). This leaves SVO languages as the most likely to not have well-developed Case
or agreement morphology. Thus, the following crude three-way typology underlies much
descriptive and/or analytical work:

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One often gets a sense that the diversity seen in human language from a morphosyntactic perspective falls within the boundaries marked out by these three poles. While many mixtures of these types are attested, there are (perhaps) no genuinely new types. Now English is a reasonably pure example of a head-initial/isolating language, as are some languages of West Africa and Southeast Asia. Japanese is a good case of a head-final, dependent-marking language, as are the South Asian languages, and Turkish. Mohawk enters the picture as a very pure example of the free word order, head-marking type. Moreover, for unfortunate historical reasons, less detailed information is known about this type of language than the others. Thus, I believe that a deeper and more sophisticated understanding of type III languages is needed, not only for its own inherent interest but also for the light that it can shed on the whole question of linguistic diversity and thus on the nature of human language as a whole. This book aspires to be a step toward this goal.

There are also two practical reasons why Mohawk is a good choice. One is that it has been relatively easy to find talented and willing native speakers of the languages to work with; see appendix C for a brief description of my consultants, data-collecting techniques, and other materials used. The other advantage is that the basic morphological structure and phonological patterns of Mohawk are reasonably well-understood, due to extensive work on it and the related Northern Iroquoian languages done by Floyd Lounsbury, his students, and others they have influenced. There results are presented in Lounsbury 1953, Postal 1979, Chafe 1967, Chafe 1970, Bonvillain 1973, Michelson 1973, Woodbury 1975, Williams 1976b, Deering and Delisle 1976 and Michelson 1989, among others. Marianne Mithun has also published an important series of articles on typologically interesting features of these languages in comparison with other polysynthetic languages over the last 15 years. Thanks to this body of materials, it has been possible to engage questions of syntax and higher-level morphology relatively directly. It would be impossible for me to cite references to every place where I have profited from this literature, but I hereby acknowledge that what I have done would have been impossible if it were not for all this previous research.

The remainder of this chapter lays some groundwork for the rest of the study in several ways. First, recent thought about the nature of linguistic diversity is reviewed in somewhat more detail, centering around the notion of a parameter. Then some typical characteristics of polysynthetic languages are presented. I will show that a common theme can be discerned in many of these characteristics, which is amenable to being stated in parametric terms. Some implications of the “polysynthesis parameter” which results from this are then briefly mapped out, outlining the topics that will be considered in detail in the rest of the book. Finally, some basic facts and assumptions about morphological and syntactic structure are introduced.
1.1 Geniuses and Parameters

If there were such a thing as a structural genius to a language in Sapir’s sense, it would clearly have to fit into Principles and Parameters theory as one of the “parameters”, the “principles” being those properties that are common to all human language. With this in mind, consider the following quotation from Chomsky 1981:6, where he introduces the classical P&P notion of a parameter: “Each of the systems of [the grammar] is based on principles with certain possibilities of parametric variation. Through the interaction of these systems, many properties of particular languages can be accounted for. We will see that there are certain complexes of properties typical of particular types of languages; such collections of properties should be explained in terms of the choice of parameters in one or another subsystem. In a tightly integrated theory with fairly rich internal structure, change in a single parameter may have complex effects, with proliferating consequences in various parts of the grammar. Ideally, we hope to find that complexes of properties differentiating otherwise similar languages are reducible to a single parameter, fixed in one way or another.”

There is a similarity between Chomsky’s conception and Sapir’s beneath the differences in terminology and conceptual background. Thus, Chomsky notion of a “parameter setting” is a single, conceptually unified feature of a language that has repercussions in different areas. This is comparable to Sapir’s notion of a single “plan” whose implications are pervasive and go beyond a few listable constructions. In the era of Chomsky 1981, the paradigmatic example of a parameter was the “Pro-Drop parameter”, based on foundational work by Rizzi (see Rizzi 1982). Thus, Italian and Spanish share the following properties, each of which distinguishes them from closely-related French (and English) (Chomsky 1981:240 and n. 14, p. 280):

(2) (i) Subjects of simple tensed clauses can be missing.
    (ii) Subjects can appear optionally after the verb in simple sentences.
    (iii) Subjects can be extracted from embedded questions.
    (iv) Null (subject) resumptive pronouns are found in embedded clauses.
    (v) Subjects can be extracted even if there is a complementizer preceding.
    (vi) Copular verbs agree with the postverbal NP rather than the expletive.
    (vii) Two adjacent verbs can “restructure” into what acts like a single verb.

These (or at least (i)-(v)) were taken to constitute a cluster of related properties, all traceable to a single well-defined difference between Spanish/Italian on the one hand, and French on the other.

There is, however, an important difference in ‘grain’ between Chomsky’s notion of a parameter and Sapir’s notion of a structural genius. Chomsky clearly envisioned a number of distinct parameters which could be set independently. French and Spanish may differ in the pro-drop parameter, but they presumably have many other parameter values in common. In contrast, Sapir only allows one structural genius per language. Chomskian parameters may have “proliferating consequences”, but they fall short of being “fundamental” and “pervasive” in the full sense that Sapir has in mind. The properties in (2) are not obviously related, but they do have a common theme: they all hinge on the fact that Spanish and
Italian are somehow permissive of null pre-verbal subjects. In contrast, Sapir says of a structural genius that it is so basic that “we [cannot] gain an adequate idea of its nature by a mere recital of the sundry facts that make up the grammar of the language.” Sapir’s notion clearly goes deeper than Chomsky’s. Thus, we might rephrase the question inspired by Sapir as this: Are there “macroparameters”?

With this in mind, let us review the history of the idea of a parameter since circa 1980. The idea has been very influential, and has produced much varied work. What are the lessons of that work? One might imagine that more and more parameters comparable to the pro-drop parameter were discovered. Then the field could have gradually noticed that these parameters (each resulting in a cluster of properties) themselves clustered in non-arbitrary ways. This would mean that the settings of different parameters were somehow related. This would have been a plausible way for macroparameters to have been discovered.

It is obvious to anyone familiar with the field that this is not what has happened. On the contrary, parameters have tended to become smaller and more construction-specific, rather than bigger and more general. Medium-sized parameters have split up into “microparameters”, rather than merging into macroparameters. Again, the pro-drop parameter is a prime example: as linguists began to pay attention to wider range of languages (including Northern Italian and Southern French dialects), the properties in (2) were seen not to make such a neat cluster after all. Rather there are languages which have some of the properties on the list, but not all. Hence more than one factor must be involved in analyzing the cluster; more than one parameter must be at work. This trend toward fragmentation rather than unification can be seen in many other cases as well, including word-order parameters, movement parameters, and configurationality parameters.

This fragmentation of parameters has in many cases reached the point where the cluster of properties accounted for by each parameter includes only one member. To the extent that this happens, the whole idea of a parametric cluster is called into question. In the limit, microparameters are no more general than the constructions of traditional grammar. As such, they are not parameters in the original sense at all, in spite of the fact that the terminology is retained. Thus while the P&P notion of a principle has proved very fruitful in many different settings, it should be conceded that the notion of a parameter has not fulfilled its original promise.

These trends have not gone unnoticed. Indeed, there is a growing stream of work that responds to it by radically paring back the idea of a parameter, to the point of near non-existence. The first important reference in this connection is Borer 1984, where it is conjectured that all parameters involve the “inflectional system” (which is defined in a technical way). Borer writes (p. 29): “The inventory of inflectional rules and of grammatical formatives in any given language is idiosyncratic and learned on the basis of input data. If all interlanguage variation is attributable to that system, the burden of learning is placed exactly on that component of grammar for which there is strong evidence of learning: the vocabulary and its idiosyncratic properties. We no longer have to assume that the data to which the child is exposed bear directly on universal principles, nor do we have to assume that the child actively selects between competing grammatical systems.”
Similarly, Fukui (1986) claims that parameters typically involve functional categories only. While Baker 1988a did not discuss the theory of parameters per se, the key driving force he found behind differences in complex predicate formation across languages is the question of whether a given morpheme is specified as an affix or not. This and similar work has combined with some of the earlier ideas to form the ill-defined but suggestive conjecture that all parameters are ‘morphological’ in nature. Chomsky (1992:4-5) tentatively adopts a version of this view, pointing out that it implies that essentially “there is only one computational system and one lexicon.”

Against this background, the thesis that there is a macroparameter distinguishing polysynthetic languages from other language types goes against the grain. Nevertheless, there are methodological reasons why macroparameters may have been missed, in spite of all of the work done on the topic over the last decade and a half. First, many linguists interested in parametric issues have adopted the methodology of comparing closely related languages, dialects, and varieties, inspired by Richard Kayne and Luigi Rizzi’s seminal work on Romance (e.g. Rizzi 1982, Kayne 1984). By using the common history of the languages as a natural control, this methodology is effective at discovering microparameters; however it is not appropriate for discovering macroparameters, because the languages it compares are too similar. Second, linguists are still too naive about parametric clusters. Any high-level parameter will involve a correspondingly abstract property of language, so its impact on particular structures will be indirect, mediated by the influence of other principles, parameter values, and lexical properties. This is well-known, but it has still not been fully internalized; linguists seem to long for a simple checklist of properties which they can mechanically run through in testing a parametric claim. Rather, in order to see valid macroparameters we must increase our ability to look beyond the effects of microparameters, using among other things the sophistication that has been gained from comparative studies of Germanic and Romance. Finally, while there has been a great increase in the diversity of languages considered from the P&P viewpoint, there are still remarkably few languages that have received attention which is sustained and comprehensive enough to discover macroparameters. This is due to many practical factors: the relative scarcity and inaccessibility of suitable speech communities, the inherent difficulty of learning the languages, the time limitations placed on theses and research grants, the need to know about everything at once. However, when these factors are put together they show why the research done so far may not be sufficient to show that there are no macroparameters.

This study tries to overcome these methodological barriers to the discovery of macroparameters. It is the result of five years of focused work on a very different language. It has sought to be a broad as possible within the area of syntax and related morphology. It has constantly kept in mind two questions: (i) what exactly are the syntactic properties of Mohawk that gives it its distinctive “Mohawkness”? and (ii) do these properties have anything in common? It also considers the question of whether there are other languages which share Mohawk’s distinctive character, if not its detailed properties. It takes a very strong position: that polysynthetic languages differ from other
languages in exactly one macroparameter. Moreover, they differ from one another only in microparameters—i.e. only in things that can be attributed to idiosyncratic morpholexical properties of the kind envisioned by Borer (1984) and Chomsky (1992).

1.2 An Initial Acquaintance with Mohawk

It is time to look at a bona fide polysynthetic language. If such languages have a property as “fundamental and pervasive” as Sapir envisioned, it should be manifest in virtually any sample of the language larger than a sentence or two. The trick is knowing what to look for. With this in mind, consider the following section of a Mohawk narrative, chosen taken from Williams 1976a:198-199. (Before this portion, the narrator has described how her father bought eight bullheads and put them in a shallow place in the river by his house.)

(3)

a. Tsyahyákshera tówa’ ətóhetste’ kík rakè-nuhá’a eh
one-week maybe it-passed this my-uncle there
t-a-ha-hráho’.
cis-fact-MsS-pull.up-punc
‘After about a week passed, my uncle pulled up [to my father’s dock].’

b. Ro-nehrakó’-u yák kík tsì ni-ka-nahskw-fyo-’s
MsO-suprise-stat PRT this how part-NsS-animal-good-hab
kík k’-[i]tsy-u.
this NsS-fish-nsf
‘He was surprised (it is said) at how good-looking the fish were.’

c. Tánu’ ki’ ne sá’ha’ ye-s-ho-nehrakó’-u tsì kwáh akwéku
and that NE more trans-iter-MsO-surprise-stat that even all
skáthne tsì núwe ni-kuti-[i]teru-’.
together that where part-ZpS-stay-imperf
‘He was even more surprised that they stayed all together in one place.’

d. Ok óni’ yák’ ná’a y-a-ho-[a]hry-úti-’
so also PRT PRT trans-fact-MsO-hook-throw-punc all
wa-hshako-yéna’ ki rabahbót.
fact-MsS/3O-catch-punc this bullhead
‘So then he threw in a fishline and caught all the bullheads.’

e. Sha’téku ni-kúti wa-hó-naw-e’.
eight part-ZpS fact-MsO-catch-punc
‘He caught [all] eight of them.’

f. Kwáh yák’ khè s-a-há-hket-e’
right PRT there iter-fact-MsS-turn.back-punc this my-uncle
kík rakè-nuhá’a
s-a-ha-[i]tsy-a-hseruny-á-hna-’.
it- fact-MsA-fish-Ø-prepare-Ø-purp-punc
‘Immediately my uncle turned back to go and prepare the fish.’
One thing that stands out about Mohawk even from this short sample is its nonconfigurational properties. Hale (1983) described three properties as being
characteristic of nonconfigurational languages in a pretheoretic sense: relative freedom of word order, the pervasive dropping of noun phrase arguments, and the existence of discontinuous expressions. All three of these properties are seen above. Thus, in (3a) the subject ‘My uncle’ precedes the intransitive verb ‘pull up’, whereas in (3f) the same noun phrase follows the intransitive verb ‘turn back’. Similar freedom is found with direct objects: in (3e) the numeral object of ‘catch’ precedes the verb, but in other examples the direct object follows the verb. Indeed, in a simple transitive sentence like (4), the subject, verb, and object can appear in any of the six logically possible orders:

(4) a. Sak ra-núhwe’-s ako-[a]tyá´tawi.
   Sak MsS-like-hab FsP-dress
   ‘Sak likes her dress.’

b. Ra-núhwe’-s Sak ako-[a]tyá´tawi.
   MsS-like-hab Jim FsP-dress

c. Sak ako-[a]tyá´tawi ra-núhwe’-s.
   Sak her-dress like

d. Ra-núhwe’-s ako-[a]tyá´tawi ne Sak.
   like her-dress NE Sak

e. Ako-[a]tyá´tawi ra-núhwe’-s ne Sak.
   her-dress like NE Sak

f. Ako-[a]tyá´tawi Sak ra-núhwe’-s.
   her-dress Sak like

This property was discussed by Postal (1979:410-11), among others. Mithun (1987) discusses in some detail the pragmatic factors influencing word order choice in the related language Cayuga. She also considers at some length whether any word order should be singled out as more basic or underlying, concluding that there is no evidence for any such choice.

The phenomenon of “argument drop” is also nicely illustrated by the text in (3). Sentence (3c) implies reference to both the uncle and the fish, but neither is represented by any independent noun phrase within the sentence. Similarly, (3b), (3d) and (3e) all contain references to the uncle, without any overt NPs. Nor is this only a property of subjects; objects can also be freely omitted in Mohawk. There are no good examples of this in (3), but (5) provides one.

(5) Ra-núhwe’-s
   MsS-like-hab
   ‘He likes it.’

Indeed, any properly inflected verb in Mohawk is considered to be a complete and proper sentence as long as it is within an appropriate context. (3a) even provides an example of a dropped possessor, since there is no overt NP corresponding to ‘my’ in the expression for ‘my uncle’. This characteristic of Mohawk is also discussed in Postal (1979) and has been noticed by all who work on Iroquoian languages.

Finally, (3d) provides an example of a discontinuous expression. Thus in the clause meaning ‘he caught all the bullheads’, the word meaning ‘all’ appears before
the verb, while the word meaning ‘bullhead’ appears after it. These two words, while clearly associated with the same argument role, do not form a NP constituent of the usual kind, at least at a superficial level of representation. This property of Mohawk is much less common, and has not been pointed out by other researchers. Nevertheless, examples are found in texts and are spontaneously produced, particularly when one of the elements is a quantifier or numeral. Speakers also accept some examples in which demonstratives or relative clauses are split from their heads, as in (6) and (7):

Part of the reason that such examples are statistically less common can simply be attributed to the fact that, apart from particles such as ne, whose functions are unclear, the average length of words in a noun phrase in Mohawk is close to one (less, if one counts pro-dropped NPs). Thus, the possibilities for discontinuous expressions are inherently limited. In addition, special discourse factors are needed to allow split NPs, particularly those like (6). Nevertheless, discontinuous NPs of some kinds are clearly allowed.

Nonconfigurational languages pose well-known problems for linguistic theory in general and P&P theories in particular. The existence of free word order and discontinuous expressions challenge the very idea of a fixed phrase structure marker over which syntactic relationships such as subject and object can be defined. Moreover, the fact that noun phrases can be omitted at will seems to challenge the Theta Criterion—the fundamental principle that for each argument position in the verb there must be one and only one NP (or other phrase) that expresses that argument. Thus, the basic syntax of Mohawk seems to be loose in a way that is very different from a language like English.

Intuitively, it is clear what makes this freedom possible in Mohawk. All Mohawk verbs are inflected to show the person, number, and gender features of both their subject and their object. Similarly, the Mohawk noun is inflected to show the features of its possessor, if it has one. These inflections are obligatory, fixed in position, and in a one-to-one correspondence with the arguments of the verb (or noun). Thus, it is natural to say that these inflections count as pronouns, and provide the true subject and object of the verb. Full NPs, when they appear, have the status of some kind of adjunct or modifier. This view is a traditional one, with a long history in Amerindian linguistics. Foley (1991:228) says that the idea goes back at least as far as Wilhelm von Humboldt’s analysis of Aztec in the 1830’s. This view is implicit in Lounsbury’s (1953) choice of the term “pronominal prefixes” for the relevant morphemes in Oneida, a language closely related to Mohawk. The idea has been developed within a P&P framework by Jelinek (1989, 1988, 1984), who was the first to point out systematically how it reconciles the basic facts of agreement-oriented nonconfigurationality with the basic principles of that framework. In these terms (4e) can be represented informally as in (8):
The same idea has been implemented in other current frameworks: Van Valin (1985) gives an analysis of Lakhota in these terms within Role and Reference Grammar; Bresnan and Mchombo (1987) do the same for Chichewa in the framework of Lexical Functional Grammar. Mithun (1987) explicitly adopts an informal version of this view for Northern Iroquoian languages, and a more technical version is found in Benger 1990 and Baker 1991a. While many questions remain about how exactly to implement this basic intuition, something along these lines seems very likely.

(3) demonstrates other properties of Mohawk that do not fit under the nonconfigurationality rubric. Even once one factors out the agreement morphemes, one still has to face the fact that much more can be expressed within the Mohawk verb than within the English verb. The most striking single example in this text is sahatsahserunyána' ‘he went back to prepare the fish’ found in (3f). Here a single Mohawk word corresponds to a seven word sentence in English. The direct object of the verb hseruny ‘prepare’ is the incorporated noun root its ‘fish’. Such noun incorporation (NI) is very common in Mohawk. (3) contains two other examples: yahohryúti‘ he threw a hook’ in (3d), and nikanahskwíyos ‘they were such beautiful animals’ in (3b). NI is quite productive, and speakers often consider incorporated and unincorporated versions of the same sentence to be essentially equivalent:

Furthermore, incorporated nouns (INs) in Mohawk can play a range of discourse roles. itsy ‘fish’ in (3f) is interpreted as a definite NP, referring to the bullheads that are the topic of the entire tale. On the other hand, ahry ‘hook’ in (3d) is
interpreted as an indefinite NP which is not otherwise referred to in the story. Finally, nahskw ‘domestic animal’ in (3b) is functioning as a kind of classifier; its reference is the same as the NP katsyu ‘fish’ that appears in the same clause. Noun Incorporation is one of the most striking properties of Mohawk; it attracts considerable attention in many works (Postal 1979, Mithun 1984a, Baker 1988a, Hopkins 1988; see also Woodbury 1975 for Onondaga).

The word sahatsyahserunyáhna ‘he went back to prepare the fish’ also contains two verbal elements: hseruny ‘prepare’, and -hna ‘go’. While the second of these is a bound affix, its semantic contribution is roughly equivalent to that of a full lexical verb in English or Mohawk. Constructions of this type are not as characteristic of Mohawk as NI is; there is no free compounding of verb stems, for example. Nevertheless, they do constitute an important part of the language, and a range of concepts including inchoatives, reversatives, and some causatives can be expressed by such affixes. Other polysynthetic languages are even richer in this regard, notably Nahuatl and Southern Tiwa.

Baker (1988a) proposed a leading idea about how complex predicates of this kinds may be accounted for. He calls attention to an abstract similarity between NI examples such as (9b) and verbal suffixes such as -hna ‘go’. The verb hninu ‘buy’ is the kind of verb that is expected to select an NP complement, and the incorporated noun is interpreted as (the head of) that complement. Similarly, verbs meaning ‘go’ standardly select a verbal/clausal complement that expresses the purpose of going, and the verb root is interpreted as (the head of) this complement. Thus, the relationship between the parts of the complex words is directly analogous in these two cases. Baker argues that these properties are to be explained by base-generating ordinary (i.e. English-like) complementation structures and allowing the head of the selected phrase to undergo movement in the syntax. This can be represented informally as in (10).

(10) a. .................................................. b.

This analysis and the generalization it is based on also has a rather long history. It was inspired by work in generative semantics in general, and by Williams’ (1976b) analysis of Tuscarora in particular. Indeed, Sapir (1911:265) stated the same generalization in pretheoretic terms for Paiute. This account goes a long way toward explaining which syntactic relationships can and cannot be expressed by productively formed morphologically complex words in Mohawk and other languages.

(3) also suggests certain miscellaneous properties of Mohawk that do not fit in any obvious
way under either the configurationality heading or the incorporation heading. For example, both of
the independent nouns in (3) are inflected with a prefix that indicates the number and gender of the
noun; this prefix is cognate to the prefixes used to indicate the subject of verbs. The clearest instance
of this is in (3b), where the noun kA’tsu ‘fish’ has the same neuter subject prefix ka- as the verbal
predicate of clause nikahskwiyos ‘they are such nice animals’. Moreover, the Mohawk sample
does not have various structures which are common in English texts, including infinitival verb
forms, prepositional phrase arguments, and sentential subjects. These gaps are not just due to the
brevity of the sample; each of these constructions is in fact absent or severely restricted in
Mohawk.

To summarize so far, many of our first impressions of Mohawk can be grouped under two
broad headings: nonconfigurational phenomena, and incorporation phenomena. In addition, there
seem to be various other properties involving things like the inflection of nouns and restrictions on
complementation. For each of the major groupings, there is a promising leading idea: Jelinek’s
pronominal argument hypothesis for nonconfigurationality, and Baker’s syntactic head movement
hypothesis for incorporation. However, no positive theoretical link between these two has been
drawn in the literature. On the contrary, Jelinek (1989) draws a negative theoretical link: she argues
that Baker-style incorporation is barred from nonconfigurational languages in general, in order to
account for a cluster of properties that distinguish the Northern Athapaskan languages from the
Southern ones (see also Benger 1990). If, however, a true relationship between these two ideas
could be found, then we would have something that begins to be worthy of being called a
macroparameter. This would be especially so if the property discovered also accounted for some of
the “miscellaneous” properties of the language; the whole would then be more than the simple some
of the parts.

1.3 Toward a macroparameter

In fact, there is an obvious common theme behind the two leading ideas. Jelinek’s approach to
configurationality holds that the inflectional morphemes on a verb count as the subject and object of
the verb. Baker’s theory of incorporation holds that one part of a derived stem is the syntactic
complement of the other part. In both cases, syntactic argument relationships are being expressed
morphologically. Suppose that this is required to be so, as a fundamental principle of certain
languages. This idea can be stated informally as in (11):

where by “head element” here I mean an Xo category in the X-bar system that is associated with an
argument structure in the lexicon; the positions in an argument structure are called θ-roles. In order
to make (11) adequately precise, however, we must specify what it means to be “related to a
morpheme”. To do this, we must define
what kinds of morphemes count as fulfilling this condition, and what sort of relationships can hold between those morphemes and the arguments of the X^o.

For purposes of this work it is sufficient to define the set of morphemes I am concerned with extensionally: they are agreement morphemes (also known as pronominal affixes) and incorporated roots. Intuitively, these are the kinds of morphemes on a verb which are suitable for expressing an argument of that verb. It has sometimes been suggested that agreement morphemes are in fact incorporated pronouns of some kind; one well-known case is Anderson’s (1982) analysis of agreement in Breton. If this is true in general, then the two classes of argument-type morphemes could be unified under the rubric of ‘incorporated element’. However, there are nontrivial problems facing such a unification which I will not explore here (see Baker and Hale 1990 for some discussion). Instead, I treat ‘being related to an agreement morpheme’ and ‘being related to an incorporated root’ as two formally distinct ways of satisfying the Polysynthesis Parameter.

The other issue to resolve is the nature of the relationship that must hold between the argument-type morphemes and the θ−roles of the verb in question. There are two possibilities. The first possibility is that the morpheme is itself the argument of the verb, receiving a θ−role from it directly. On this interpretation, the Polysynthesis Parameter becomes very similar to the Theta Criterion, which is usually stated more or less as in (12):
(12) *The Theta Criterion* (Chomsky 1981:36)

For every θ-role there must be one and only one argument.

For every argument there must be one and only one θ-role.

The Polysynthesis Parameter then would be basically equivalent to saying that in some languages the Theta Criterion must be met morphologically rather than syntactically. This seems to capture the intentions of much of the traditional literature on these languages, inasmuch as the intuitions of the researchers can be usefully translated into generative terminology. It is quite explicitly the position of Jelinek (1984) for agreement morphemes.

The alternative understanding of (11) would be to say that the morphemes on the verb do not replace conventional argument phrases in these languages, but rather in some sense reinforce them. This is the position I adopt. The difference between this view and the previous one can be illustrated by comparing the syntactic structures that each would assign to a sentence like (9b):

(13)  

a. IP
    I
    past/Ms
    VP
    V
    N_k
    bed
    buy
    <Ag_1, Th_k>

b. IP
    I
    pro
    NP
    past/Ms
    V
    NP
    N_k
    buy
    bed
    <Ag_1, Th_k>

(Both structures assume that tense and agreement morphology is associated with a distinct head position I(nflexion); this is discussed below.) If the Theta Criterion applies word-internally rather than at the level of the sentence, then the syntactic structure of a form like this one is trivial, consisting of little more than the verb itself, as in (13a). In particular, there is no subject NP or object NP. On the alternative interpretation, the Theta Criterion must still be met syntactically and hence these NPs must exist, although they may be phonetically empty, as shown in (13b). On this interpretation, a subject agreement on the verb does not render superfluous a null pronominal in subject position; nor does an incorporated direct object render superfluous a null, trace-headed NP in object position. Here there is a much closer correspondence between the structure of the Mohawk sentence and that of its English gloss.

The (13b) analysis is assumption is consistent with my previous work (Baker 1988, 1991), but is in sharp contrast with the closely related ideas of Jelinek (1984) and Marantz (1984). Jelinek explicitly holds that θ-roles are assigned to agreement morphemes instead of to syntactic argument positions. Similarly, Marantz claims that (after merger) incorporated roots receive thematic roles instead of the phrases that they originally headed, which are no longer projected. (13b) has two types of advantages. First, one can capture restrictions on what a verb can agree with or incorporate by saying that the morpheme inside the verbal form must be in the proper structural relationship to an empty category outside it (i.e., the government relationship). This rationale for positing empty
categories is parallel to Chomsky’s (1976, 1981, 1982) well-known argument for traces and PROs in which he claims that if these categories are posited, then the relationships between “gaps” and their antecedents reduce for the most part to independently motivated principles of anaphora. Second, (13a) allows one to apply linguistic principles such as those of Binding theory, weak crossover, and so on to a language like Mohawk in their standard forms. It may be possible to rephrase most of my analyses such that they work over a structure like (13a), but there are no clear conceptual advantages to doing so. There would be a decrease in the abstractness of the syntactic representation, but there would be a corresponding increase in the abstractness of the conditions that are defined over syntactic representation. I do not know of anything that would gained by doing this. There are also one or two places in the course of this work where it is particularly important to adopt (13b) over (13a).

How then do we develop (11) into a precise principle? The most natural way is to understand it not as a parameterized version of the Theta Criterion, but rather as a condition on argument relationships (i.e. θ-role assignment) that holds in some languages. Standard P&P theory includes a condition of this type as a way of deriving the Case Filter. Thus, Chomsky (1981:ch. 6), developing an idea attributed to Joseph Aoun, proposes the so-called Visibility Condition, which says that a phrase is ‘visible’ (i.e. eligible) for θ-role assignment only if it is assigned abstract Case. Inspired by this, I propose (14) as the distinctive property of Mohawk and typologically similar languages:

(14) **The Morphological Visibility Condition** (MVC)

A phrase X is visible for θ-role assignment from a head Y only if it is coindexed with a morpheme in the word containing Y via:
(i) an agreement relationship, or
(ii) a movement relationship

Yes: Mohawk, Nahuatl, Rembarrnga,...
No: English, French, Chichewa, ....

This means that while there must be a relationship between each θ-role of (say) a verb and a morpheme on that verb, this relationship is not direct. Rather it is mediated by an NP or an argument of some other category. Thus, the verb’s θ-role must be assigned to an appropriate phrase by the (conventional) Theta Criterion, and that phrase must be coindexed with a morpheme on the verb by the MVC. The two types of coindexing relationships allowed are two of those standardly permitted in P&P theory: the coindexing that holds between an NP and an agreeing category, and the coindexing that holds between a moved element and the trace left behind by movement. Arguably these are the only two syntactic dependencies that are relevant to zero-level lexical categories; other relationships such as referential dependency are defined for maximal projections only. I represent both relationships by coindexing for convenience, but do not by this make any claims about the actual role of indices in syntactic structure. Throughout this work I refer to (14) as both the Polysynthesis Parameter and the Morphological Visibility Condition (MVC). The two terms to differ in sense but not in reference: calling (14) ‘the Polysynthesis Parameter’ emphasizes its status in the grammar and its observed effects on a language; calling it the MVC emphasizes its conceptual content.

It is worth considering the possibility of breaking the MVC into two separate parameters, one which says that agreement makes a phrase visible for θ-role assignment, and one which says that incorporation makes a phrase visible for θ-role assignment. This would define at least three types of languages. First, there is the Mohawk type, in which both agreements and lexical roots count as rendering an argument visible. Languages with this property I call polysynthetic. In this I am giving a technical sense to a word that Boas (1911) and Sapir (1921) use rather impressionistically in their typologies. Sapir characterizes polysynthetic languages as follows: “A polysynthetic language, as its name implies, is more than ordinarily synthetic. The elaboration of the word is
extreme. Concepts which we should never dream of treating in a subordinate fashion are symbolized by derivational affixes or ‘symbolic’ changes in the radical element, while more abstract notions, including the syntactic relations, may also be conveyed by the word (Sapir 1921:128).” Thus, for Boas and Sapir polysynthetic languages make the most use of morphology to represent grammatical notions; thus it is natural to associate this label with the broadest setting of (14). Note also that Sapir’s notion of polysynthesis explicitly includes both combinations of radical plus derivational affix (many of which are due to incorporation in my sense) and indications of “abstract notions including the syntactic relations” (i.e. inflectional morphology, such as agreement). Thus, this technical usage of the term ‘polysynthetic’ seems in the spirit of the word’s original pre-theoretic sense. However, it must be emphasized that many languages which Sapir and Boas would have called polysynthetic are not polysynthetic in my narrower and more technical sense. Some languages with quite impressive amounts of morphological complexity may not use that complexity to systematically represent argument relationships, as we shall see below. My claim is that these languages are of a fundamentally different type from Mohawk.

Second, breaking up (14) into two parameters would allow for languages in which arguments must be agreed with, but which do not allow incorporated roots to make arguments visible. These would be languages for which Jelinek’s theory of nonconfigurationality holds, but which either do not have incorporation phenomena at all, or have only sporadic incorporation that does not interact with agreement. These can be called ‘nonconfigurational head-marking languages’, where the term ‘head-marking is taken from Nichols (1986). Many of the languages that Jelinek herself has studied may be of this type: Warlpiri, Navajo, Salish, Choctaw, and perhaps the Algonquian languages. This class of languages is not a primary focus of study in this work, and its existence seems likely but remains to be proven conclusively.

Third, there are languages for which neither part of (14) holds. These will be of a wide variety of types, since their “structural geniuses” lie elsewhere. Certainly they include configurational, isolating languages like English, Yoruba and Chinese. They also include head final languages--both those which are configurational, and those like Japanese, Hindi, and German whose nonconfigurational characteristics seem to be due to Case-marking rather than agreement. They will even include languages which have some pronominal affixes and/or incorporation phenomena, but where this is not systematic for all argument types. Examples of this are Bantu languages such as Chichewa (Bresnan and Mchombo 1987, Baker 1988a), Northern Athapaskan languages such as Slave (Rice 1989), Haisla (Bach 1993), and Papuan languages such as Alamblak (Bruce 1984) and Yimas (Foley 1991). Such languages may make use of the same constructions as Mohawk, but they are not forced to do so by the MVC. These languages can and do have a considerable degree of morphological complexity; for example, Haisla and Slave are not strikingly less “polysynthetic” than Mohawk in the pre-theoretic sense. Nevertheless, in Haisla there is no incorporation, no true agreement, and the affixes (of which there are around 500) “never seem to encode the primary arguments of stems (Bach 1993:6). Thus, I claim that even these languages have a fundamentally different parameter setting from Mohawk.

In principle, this system would seem to allow a fourth type of language: one in which argument relationships must be represented by some type of head-marking but agreement does not suffice. In fact, such a language could not exist on general principles. The reason is simply that incorporation is not flexible enough to satisfy the MVC by itself. NI is typically limited to (underlying) direct objects. This is seen overtly across languages, and has a plausible theoretical account: only movement from a direct object is consistent with the standard properties of Move-Alpha; see Baker 1988a:ch. 2, 3 and chapter 7 below for extensive discussion. Thus, any verb that took a subject argument would violate the MVC in such a language. But presumably all languages have such verbs. Therefore no such language could exist.

1.4 Preliminary evidence for the MVC
As acknowledged above, no part of the Polysynthesis Parameter is really new. The statement that agreement morphemes can represent arguments is found in Jelinek 1984; the fact that lexical roots and affixes can be found in Marantz 1984 and Baker 1988a. What originality the proposal has comes from putting both types of morphology under the same principle. The key idea of the Polysynthesis Parameter is that agreement morphemes and incorporated noun roots are part of the same system. If this is so, we should expect there to be interactions between the two. In fact, such interactions can be seen at three different levels, which encourages us to think that this is on the right track.

(i) Across languages and language families. It is plausible heuristic to suppose that the presence of robust noun incorporation is a reasonably reliable indication that incorporated nouns count for the MVC, and hence that the value of (14) for the language in question is “yes”. Then the reasoning given at the end of the last section implies that the language must also have pronominal agreement morphemes.

For these purposes, we may consider noun incorporation to be “robust” in a language if it is:
(a) reasonably productive, (b) the noun root is fully integrated with the verb morphologically, (c) the noun is referentially active in the discourse (see Mithun 1984a and chapter 6 below), and (d) both the noun root and the verb root can in general be used independently. The rationale for these criteria is as follows. Criteria (a) and (c) defend against languages where NI is only a matter of lexicalizations and historical residues. Criterion (b) avoids the question of caseless/determinerless NPs adjacent to the V in verb-final languages; these constructions have been analyzed as noun incorporation in, for example, Turkish (Knecht 1985) and Hindi (Mohanan 1991), but Lamontagne and Travis (1987) provide another approach to this sort of phenomenon. Criterion (c) eliminates languages with productive N-V compounding in the lexicon, such as various Oceanic languages on Rosen’s (1989) analysis. (d) is excludes languages like the those of the Eskimoan family, where NI is obligatory with some verbs and forbidden with the rest (Sadock 1980, Fortescue 1984; see also Sapir 1911).

Languages which seem to have NI that meets these four criteria include: Mohawk and the other Northern Iroquoian languages (e.g. Seneca (Chafe 1967), Tuscarora (Williams 1976b)), Wichita (Rood 1976), Kiowa (Watkins 1984) and Southern Tiwa (Allen, Gardiner et al. 1984), Huauhtla Nahuatl (Merlan 1976; see also Andrews 1975 for Classical Nahuatl), the Gunwinjguan languages of Northern Australia, Chukchee (see Spencer 1993 and references cited there), and perhaps Classical Ainu (Shibatani 1990). This list includes at least one member of every language family considered to have type III or IV NI (NI which is discourse relevant) in Mithun’s (1984a) survey article, plus two others in which significant information has come out only since Mithun’s article (the Tanoan languages, where Mithun’s criteria clearly apply, and Ainu, where data is inconclusive).

Strikingly, every one of these languages has full and obligatory agreement paradigms for both subject and object (allowing for the possibility of some phonologically null third person forms). Not surprisingly, the languages also allow argument-drop and at least some degree of freedom in word order. This overall pattern is highly significant. There seems to be an implicational universal: all languages with full-fledged noun incorporation phenomena fall within the class of nonconfigurational head-marking languages. Nothing in (say) the theory of Jelinek (1984) or Baker (1988a) predicts that this should be so. However, the Polysynthesis Parameter explains why the two properties should be related in this way. This set of languages are those that I henceforth refer to as the (true) polysynthetic languages, and I draw on them for comparison purposes throughout this book.

(ii) The macro-structure of Mohawk. There is a curious functional complementarity between agreement morphemes and NI in Mohawk. As a general rule, NI is a property of inanimate nouns that fill the direct object role and meet certain morphological conditions. Interestingly, this is the only class of argument for which there is no trace of an overt agreement morpheme. Thus, the agreement morphology of a transitive verb with subject X and an inanimate object is always identical to the agreement morphology on an intransitive verb with subject X (Postal 1979, Mithun 1986b, Baker 1990b). A representative example of this is in (15):
(15) a. yu-[a]táw-s
   FsS-swim-hab
   ‘she is swimming’

   b. ye-núhwe’-s (ne áthere’)
   FsS(NsO)-like-hab NE basket
   ‘she likes it (the basket)’

On the other hand, NI of animate direct objects is limited and NI of subjects and indirect objects is completely impossible. There are, however, visible agreement morphemes for all of these categories in the Mohawk verbal paradigm. Together, agreement and noun incorporation virtually partition the class of nominal arguments: for each type of argument there is one and only one mode of morphological expression available. This kind of complementarity makes sense if NI and agreement are part of the same system for expressing argument relationships; otherwise, it is a peculiar coincidence. Evans (1993) emphasizes the same kind of functional partitioning in the Gunwinjguan language Mayali.

(iii) The micro-structure of Mohawk. An even more striking complementarity between agreement and noun incorporation is seen within that narrow range where there is a potential choice: the area of incorporable animate objects. There are some veins of Mohawk in which such examples can be found; see chapter 7 for discussion. In this domain, one finds paradigms like the following:

(16) a. *Ra-núhwe’-s ne owirá’a.
    MsS-like-hab NE baby
    ‘He likes babies.’

   b. Shako-núhwe’-s (ne owirá’a).
    MsS/3pO-like-hab NE baby
    ‘He likes them (babies).’

   c. Ra-wir-a-núhwe’-s.
    MsS-baby-Ø-like-hab
    ‘He likes babies.’

   d. *?Shako-wir-a-núhwe’-s.
    MsS/3pO-baby-Ø-like-hab
    ‘He likes babies.’

In these examples one may have either an object agreement morpheme or an incorporated noun root. However, it is ungrammatical to have neither, as shown by (16a). This form cannot be ruled out on purely morphological grounds: the verb is grammatical as ‘he likes it’, where ‘it’ refers to an inanimate object. One cannot even say that agreement is obligatory when the object of the verb refers to a baby, given the existence of (16c). The form is correctly ruled out by the MVC, however: the verb has an obligatory internal (object) θ-role but there is no corresponding morpheme within the word to make visible an argument that receives that θ-role.

It must be conceded that the necessity of NI or agreement is not always apparent on the surface in Mohawk. I have already alluded to the fact that verbs with neuter objects and no incorporated noun root seem to have no morpheme on the verb that indicates the object. Thus, (16a) becomes perfect when one replaces the animate NP owirá’a ‘baby’ with an inanimate one like ká’sere’ ‘car’. However, this problem disappears if we assume that Mohawk has a phonologically null third person neuter morpheme on the verb in these cases. Positing the existence of such zero morphemes is a common practice in both the descriptive and theoretical literatures; for example this device is used explicitly in Jelinek 1984 as well as most descriptions or analyses of head-marking.
languages (e.g. Mithun 1986b for Mohawk). The important thing is that this Ø element is restricted to 3rd person neuter; for other person-gender categories the form is not in general Ø and the need for either agreement or incorporation shows up clearly.

The Nahuatlan languages are particularly clear in this regard because they have overt object agreement even for neuter third person objects. Thus, the complementarity between object agreement and noun incorporation can be seen overtly in a much wider range of examples. Merlan (1976:187) gives the following minimal pair for the Huauhtla dialect:

   he 3sS-3sO-closed door-nsf
   ‘He closed the door.’

   b. Ne? Ø-kal-ca?-ki.
   he 3sS-door-closed
   ‘He closed the door.’

The object agreement ki- is absent in (17b), yet cannot be dropped in (17a). Again either an agreement morpheme or an incorporated root is adequate to make the verb’s internal argument visible, but one or the other is strictly required. Andrews (1975:ch. 23) and Launey (1981) present similar facts for Classical Nahautl. Comparable effects are found in Chukchee (Nedjalkov 1976:197) and one dialect of Ainu (Shibatani 1990:61).

So far I have contrasted the examples in (16b) and (16c) with (16a) to show that some morphological expression of the object argument is necessary. Interestingly, (16d) shows that one also cannot have both agreement and an incorporated noun root in Mohawk. Rather, when the noun root is incorporated, the object agreement morpheme on the verb must be lost. Significantly, this is true even when an overt NP is present which doubles the incorporated root, showing that the construction is still transitive in some sense:

(18) a. Ra-wir-a-núhwe’-s that baby
   MsS-baby-Ø-like-hab
   ‘He likes that baby.’

   b. *Shako-wir-a-núhwe’-s that baby
   MsS/FsO-baby-Ø-like-hab
   ‘He likes that baby.’

The same complementarity is found in Nahuatl: the object agreement marker ki- cannot be added to (17b). This is true even though the incorporated noun can be understood as definite, referring to something already present in the discourse, as Merlan shows with some care. Moreover, one cannot rule out the co-occurrence of NI and object agreement by saying that object agreement and INs compete for the same position in a morphological template. Object agreement and INs do appear on the same verb in both Mohawk ((19)) and Nahuatl ((20)) when the verb root is triadic, selecting two internal arguments.

(19) T-a-shako-wír-u’.
    cis-fact-MsS/FsO-baby-give-punc
    ‘He handed her the baby.’

(20) ni-mic-tomi-maka (Merlan 1976:184-185)
    1sS-2sO-money-give
    ‘I’ll give you money’
This shows that it is not the co-occurrence of object agreement and noun root per se which is the problem in (16d), but rather the redundancy that comes from the fact that both the agreement and the noun root are associated with the same argument.

Interestingly, the status of examples like (16d) is a point on which polysynthetic languages vary. Thus, agreement with the object is retained even when the head of the object is incorporated in the Northern Australian languages ((21) from Mayali) and the Tanoan languages ((22) from Southern Tiwa):

(21) a. Nga-ban-yaw-na-ng. (Evans, personal communication)
1sS-3pO-baby-saw-past/punc
‘I saw the babies.’

3sS/3hO-child-eat-past/punc crocodile.
‘The crocodile ate the child.’

(22) Bi-seuan-m˜u-ban. (Allen, Gardiner et al. 1984:295)
1sS/3pO-man-see-past
‘I saw the men.’

(21) would be ungrammatical on the given interpretation if the object agreement morpheme were omitted. Similarly, the agreement prefix in (22) is a portmanteau that indicates the gender class and number of the object; it is distinct from the prefix that would appear if there were a first person subject with an intransitive verb (te-) or the one that would appear if the object were in a different gender/number class (ti- or te-). This difference between Iroquoian/Aztecan on the one hand and Australian/Tanoan on the other hand seems to be a rather superficial one that does not correlate with any other important properties of the languages in question. In particular, it does not correlate with the transitivity of the construction, as measured by the possibility of having an independent NP doubling the IN (contra Rosen 1989): Mohawk and Mayali both allow full NP doubles, while Nahuatl and Southern Tiwa do not. Indeed, Shibatani (1990) shows that dialects of Ainu differ minimally in this regard.

This variation is significant because it confirms the decision to treat the Polysynthesis Parameter as a type of Visibility Condition rather than as a special way of applying the Theta Criterion. The Theta Criterion requires there to be a biuniqueness between arguments and positions in a θ−grid. This is what we find in (16) in Mohawk and (17) in Nahuatl if agreement morphemes and incorporated noun roots count as arguments. In particular, (16d) would be ruled out because there are two argument-type morphemes associated with a single position in a θ−grid. However, this approach would also incorrectly rule out (21) and (22). We would be forced to conclude that Mayali and Southern Tiwa either are not polysynthetic after all or do not have syntactic noun incorporation—both undesirable conclusions. On the other hand, when the Polysynthesis Parameter is stated as a Visibility Condition as in (14) it is sufficient to rule out (16a) in contrast to (16b,c), but is silent on the status of (16d). This formulation requires that the direct object NP be coindexed with a morpheme in the verb, but crucially does not require that that morpheme be unique. Thus, low-level variation within the class of polysynthetic languages is tolerated on exactly this point, corresponding to what we observe.

1.5 Other Implications and Prospectus

So far we have concentrated on the MVC’s ability to explain interactions between agreement and incorporation. These interactions are crucial in motivating the basic idea of the parameter. However, it is easy to see that if this principle will influence languages in which it holds in many other ways as
First, the MVC also has a significant role to play within the analysis of nonconfigurationality proper. In particular, it determines the extent to which the Jelinek-style pronominal argument analysis applies to a given language. Part of Jelinek’s idea is that inflections on the verb count as pronouns and satisfy the \( \theta \)-positions of that verb. However, in order to properly account for the facts of Mohawk one must also stipulate that such inflections must appear on the verb. Translating into my terms, the arguments of the verb must be made visible in this way rather than in some other. Without this stipulation, an object agreement morpheme (for example) could simply be omitted. This then would allow an independent NP to be the syntactic argument of the verb, becoming visible by ordinary Case assignment as in English. The ungrammaticality of (16a) shows that this is not an option in Mohawk. However, the possibility cannot be ruled out by Universal Grammar, since other languages do exactly this. Chichewa as analyzed by Bresnan and Mchombo (1987) is one important example:

(23) a. Njúchi zi-ná-lúm-a alenje.
bees SM-past-bite-ind hunters
‘The bees bit the hunters.’

b. Njúchi zi-ná-wá-lum-a (alenje).
bees SM-past-OM-bite-ind hunters
‘The bees bit the hunters.’
OK: SVO, VOS, OVS, VSO, SOV, and OSV orders

When there is no object marker on a transitive verb, as in (23a), a full NP object must be right-adjacent to the verb. When there is an object marker on the verb ((23b)), however, this acts as the true object of the verb. An additional NP can be adjoined to the clause, but it has no fixed syntactic position. Thus, Chichewa seems to have both an English-like configurational mode, and a Mohawk-like nonconfigurational mode. Similar facts hold in Northern Athapaskan languages, such as Slave (Rice 1989). Indeed, the pattern seems to be rather common cross-linguistically; perhaps even Spanish is to be analyzed in this way (Jelinek 1984:48-49). Mohawk, however, does not have a similar, (partially) configurational mode, as will be seen in detail in Chapter 2. The MVC explains why this is so. Mohawk and Chichewa have comparable object agreement morphemes, but only Mohawk is required to use them. More generally, the MVC explains why polysynthetic languages must have obligatory agreement with all NP argument positions: subject, object, indirect object. It seems correct to say that such languages are of a distinctly different type than languages like Chichewa, Slave, and Spanish where agreement is partial and/or optional. In a sense the MVC puts teeth into Jelinek’s proposals concerning nonconfigurationality.

This reasoning has implications that go beyond the familiar configurationality cluster. Suppose, for example, that a given category had no agreement associated with it and could not incorporate. The MVC then implies that such a category could never appear as an argument. In chapter 9, I argue that this explains the systematic absence of PP arguments in Mohawk. Interestingly, argument PPs also appear to be lacking in other polysynthetic languages, although they are certainly found in non-polysynthetic languages like Slave (Rice 1989). The condition that all arguments must be correspond to a morpheme on the head also has important implications for the internal structure of NPs in polysynthetic languages, as discussed in chapter 5.

The MVC also implies that a polysynthetic language will not be able to have anything comparable to an infinitive in English and other Indo-European languages. The reason is simple: infinitival forms lack agreement inflection for the subject; hence any verb that selected a subject
\( \theta \)-role and appeared in an infinitival form would violate the MVC outright. This fits with another observation about Mohawk made above. (24) shows how typical infinitival constructions in English are translated into Mohawk.

(24) \text{K-ate'ny\'\'t-ha' au-sa-ke'-sere-hs\'er\'u\'ni-'.} \\
\text{IsS-try-hab opt-iter-IsS-car-nom-Ø-fix-punc} \\
\text{‘I am trying to fix the car.’}

Here the embedded verb form in the optative mood has exactly the same subject agreement as the matrix verb. Most other languages tentatively identified as polysynthetic also lack infinitival verb forms: Nahuatl (Andrews 1975:14-15, 17), Kiowa (Watkins 1984:146-147), Nunggubuyu (Heath 1986:305), Mayali (Evans 1991:332-335) and Ainu (Shibatani 1990) all fit this generalization, as discussed in chapter 10. Indeed, this is a known typological feature of head-marking languages, noticed by a variety of people and vindicated by Nichols (1992). In contrast, the Bantu languages do have infinitival forms; for example in (25) from Swahili both the tense-aspect prefix and the otherwise obligatory subject agreement marker are replaced by invariant ku- (Vitale 1981:sec. 4.1.3):

(25) Juma a-li-jaribu ku-fungua mlango. \\
Juma 3sS-past-try to-open door \\
‘Juma tried to open the door.’

Such infinitival clauses have an obligatorily null subject, which can only be understood as coreferential with the matrix subject, as in English. This is permitted because the MVC does not hold in Swahili. This also makes the prediction that polysynthetic languages will lack the special types of complementation inherently associated with infinitival constructions in English, such as obligatory control. Chapter 10 also shows that this is true, with one principled class of exceptions.

Finally, the MVC can be interpreted as playing an important role in determining the kind of incorporation structures a language will have. We observed in connection with (3) above that noun incorporation in Mohawk is impressive in terms of its frequency, productivity, and referential properties. In contrast, Mohawk is quite modest in its verb incorporation. There are at most five suffixes that can plausibly be analyzed as higher verbs. More importantly, those verb incorporation triggers that do exist are quite limited in their use by the standards of other languages. In particular, the causative morpheme attaches only to a subclass of the intransitive verbs; it is completely impossible on transitives verbs:

(26) a. Wa'-t-ha-[a]’shar-á-'tsu-st-e'. \\
fact-dup-MsS-knife-Ø-be.dirty-caus-punc \\
‘He made the knife dirty.’

b. Uwári t-a-yú-[a]hsa-ht-e’ ne á’share’. \\
Mary cis-fact-FsS-fall-caus-punc NE knife \\
‘Mary made the knife fall.’

(27) a. *(O’n\'aste’) wa-hi-y\'\'tho-hs-ht-e’ Sak. \\
corn fact-1sS/MsO-plant-caus-punc Sak \\
‘I made Sak plant it (corn).’

b. *Ká’sere wa’-uk-hnínu-ht-e’. \\
car fact-FsS/1sO-buy-caus-punc \\
‘She made me buy a car.’
Now verbs differ from nouns in that they are canonically argument-takers; in general they select for some kind of argument of their own. Consider then an abstract structure in which a transitive V is incorporated:

\[(28)\]

\[
\begin{array}{c}
S \\
\downarrow \text{NP} \\
\text{she} \\
\downarrow \text{VP} \\
\text{Agr} \hspace{1cm} \text{V} \hspace{1cm} \text{V} \hspace{1cm} \text{NP} \hspace{1cm} \text{VP} \\
\text{Fs--1s} \hspace{1cm} \text{buy} \hspace{1cm} \text{make} \hspace{1cm} \text{me} \hspace{1cm} \text{V} \hspace{1cm} \text{NP} \hspace{1cm} \text{it} \\
\text{(Ag, Th)} \hspace{1cm} \text{(Ag, Th, Go)} \hspace{1cm} \text{n} \hspace{1cm} \text{m} \hspace{1cm} \text{i} \hspace{1cm} \text{n} \\
\end{array}
\]

The derived word in this structure contains two lexical categories: the incorporee and the host of the incorporation. So far, we have focused on how the MVC is satisfied with respect to the incorporation host. However, the principle presumably applies to the incorporee as well. For noun incorporation, the question did not arise, since nouns usually do not take arguments. The question does arise in (28), however, and proves problematic. The most flexible way to represent arguments is via agreement morphology. However, incorporated roots are always incorporated “bare”, without the inflectional morphology they would have if they stood alone. This has been observed by many people across many languages, and there is presumably some deep theoretical reason for it (e.g. see Li 1990, Baker and Hale 1990 and below). Neither will the agreements associated with the incorporation host be available to represent the arguments of the incorporee, since they will in general be needed to satisfy the host’s θ-grid. Interpreted in this way, the MVC puts pressure against the incorporation of verbs, particularly verbs with multiple arguments. From this perspective, it is no coincidence that Mohawk limits causatives to intransitive verbs only.

Indeed similar transitive restrictions on morphological causatives are found in the other languages that are rich in noun incorporation, including the other Iroquoian languages (Chafe 1967, Williams 1976b), the Gunwinjguan languages (cf. e.g. Heath 1984:393-395 for Nunggubuyu), Chukchee (Nedjalkov 1976), and arguably Wichita (Rood 1976). Conversely, those languages which are well-known to allow causatives of transitive verbs typically do not allow productive noun incorporation: this includes Bantu languages in general, Chamorro, Malayalam, Turkish, and Japanese. This negative correlation between NI and VI could not be explained under the assumptions in Baker 1988a, where it was assumed that incorporation was triggered purely by morphological properties such as whether or not a given morpheme was an affix or whether or not N-V compounding was allowed. The MVC, however, has the potential to explain this negative correlation by encouraging NI in languages where it holds, while discouraging most kinds of VI in languages in those languages. However, many theoretical and empirical complexities arise in working out this intuitive idea, and it is the task of chapters 7 and 8 to sort these out. This reasoning also has implications for the analysis of applicative constructions in polysynthetic languages, discussed in chapter 9.

This preliminary survey suggests there is a property of polysynthetic languages which qualifies as a true parameter. Indeed, its implications are broad enough to be worthy of the term “macroparameter”.
1.6 On Morphological Structure and Syntactic Structure

Before beginning the detailed exposition, it will be helpful to clarify certain aspects of the hierarchical structure of the polysynthetic languages. We have already seen that these languages have nonconfigurational syntaxes, where elements are rather freely ordered and give little evidence for phrasal groups. In contrast, word-internal structure in these languages is very configurational indeed. Not surprisingly, the relative order of morphemes within each language is almost always rigidly fixed, with few opportunities for alternative arrangements; this is a near universal property of morphology. More remarkable is the fact that the order of basic morphemes is also quite consistent across the polysynthetic languages. Thus, readers will be better equipped to understand the examples if they have some awareness of this structure. Furthermore, I believe that this morpheme order provides a clue to the basic syntactic structure of these languages, something that is difficult (although not necessarily impossible) to establish by conventional syntactic means.

Consider first noun incorporation in the seven language families where it is syntactic: Iroquoian, Caddoan, Tanoan, Nahuatl, Gunwiniguan, Chukchee, and Ainu. In Mohawk, we have seen that an incorporated noun root comes just before the verb root, between it and the agreement prefixes. Strikingly, this is where the incorporated noun root appears in the other six language families as well:

(29) a. wa-hake-natar-a-kwétar-ʌ-’ MOHAWK
    fact-MsS/1sO-bread-Ø-cut-ben-punc
    ‘he cut the bread for me’

b. i-s-kí-icˈʔasin-nʔi WICHITA (Rood 1976:15)
    imper-2sS-TsO-ben-shoe-make/pl
    ‘make me a pair of shoes’

c. ka-ˈu’u-wia-ban S. TIWA (Allen, Gardiner et al. 1984:303)
    1sS/2sO|AO-baby-give-past
    ‘I gave you the baby’

d. ni-quin-xöchi-tëmo-lia NAHUATL (Andrews 1975:164)
    1sS-3pO-flower-seek-ben/pres
    ‘I seek flowers for them’

e. bandi-mame-gani-ginje-ng MAYALI (Evans 1991:210)
    3pS/3pO-ben-meat-cook-past/punc
    ‘they cooked meat for them’

f. mød-mec-gora-görke-plőtko-mök CHUKCHEE (Spencer 1993:39)
    1pS-almost-deer-hunt-finish-1sS
    ‘we almost finished hunting reindeer’

g. a-Ø-ko-tam-enere. AINU (Shibatani 1990:69)
    1sS-3sO-appl-sword-swing
    ‘I swung the sword at them’

This is unlikely to be due to chance. It is known that lexical N-V compounds can in general have the verb first or the noun first, depending perhaps on the basic word order parameters of the language (Lieber 1993). Suppose then for the sake of argument that an incorporated N were equally likely to appear to the left or to the right of the verb root. Then the probability of it appearing to the left in all
seven language families would be \((1/2)^7\), or 0.0078125. When one takes it into account that the position as well as the direction of the IN is uniform, this becomes even more remarkable.

Verbal morphemes that trigger verb movement also show up in a very consistent place in the complex verb. We have seen two such morphemes in Mohawk: the causative and the purposive. Both are suffixes, appearing after the verb root but before any inflectional morphology, as seen in (3f) and (26) above. Exactly the same is true in the other polysynthetic languages. Thus, causative morphemes exist in Wichita, Kiowa, Southern Tiwa, Nahuatl, Ainu, and the various Gunwinjguan languages; in each case it is a suffix that precedes tense/aspect morphology. The only complication is Chukchee, where the causative morpheme is a circumfix, consisting of the prefix r- or n- and the suffix -ew or -aw (Nedjalkov 1976:186, Bogoras 1922:819); even here the suffix part appears in the expected position. Similarly, purposive-like morphemes meaning ‘go in order to’ exist not only in Mohawk but in Wichita (Rood 1976:169-170), Tanoan, Nahuatl, and (with a slightly different meaning) Mayali. Again, these all come after the (first) verb root but before inflectional morphology. Desiderative elements meaning ‘want’ are found in at least Southern Tiwa, Nahuatl, and Chukchee, and probably in Ainu. Again, they all come after the verb root except for in Chukchee, where the desiderative is again a circumfix ra- plus -ng (Nedjalkov 1976:191, Bogoras 1922:821). Various other verb-verb combinations can be formed in these languages, and the same generalization holds throughout: the morpheme that one would treat as the higher predicate semantically consistently follows the morpheme that expresses the lower predicate. Examples of most of these types can be found in chapter 8. Again, this degree of uniformity in word structure cannot be a coincidence.

Significantly, a simple generalization covers both of these two cases. This becomes obvious when we compare once again the simple NI structure in Mohawk with the verb incorporation structure of the purposive. (30) is repeated from (10):

(30) a. 

```
S  NP     VP 
I   he    V   V   NP 
N   bed   buy   N   t
```

b. 

```
S  NP     VP 
N   he    V   V   NP 
V   fish- prepare   go   t  
V   t
```

The syntactic similarity between the two was pointed out before: in both, the maximal projection of one morpheme is an argument of the other, and the lower morpheme moves to adjoin to the higher one. We now notice a morphological similarity as well: in both cases, the moved morpheme adjoins to the left of the target morpheme. This recalls Kayne’s (to appear) hypothesis that there are no basic ordering parameters in natural language. In particular, it follows from Kayne’s system that if an element X is adjoined to an element Y, then X must precede Y. One source of evidence that he gives for this is the claim that pronominal clitics in Romance always adjoin to the left of the functional category that hosts them, superficial appearances notwithstanding. In this work, I will not commit myself to Kayne’s general claim, but I adopt his view for the special case where X and Y are head-level categories. This is stated in (31):

(31) If X and Y are X-o-level categories and X is adjoined to Y in the syntax, then X precedes Y in linear order.
This explains why incorporated nouns always precede the verb root, and why the verb root always precedes an affix or root that expresses a higher verbal predicate.

The other thing that is consistent across these languages is that incorporated noun roots follow inflectional prefixes such as agreement (see (29)), while verbal suffixes precede inflectional suffixes such as tense and aspect. This observation does not follow from (31) by itself. It does, however, fit naturally with the P&P claim that (many) inflectional morphemes count as phrase structure heads in their own right. If this is so, then it is possible for a verb to combine with these heads only after NI or VI has taken place. Indeed, there are morpheme order regularities that hold of ‘inflectional’ morphemes as well. In particular, most of the polysynthetic languages have aspect morphology (e.g. perfective vs. imperfective) and some kind of tense and/or mood morphology (e.g. past vs. nonpast, factual vs. irrealis, etc.). Where these can be clearly distinguished from one another, their relative position is consistent: aspect is a suffix that follows the verb root and any ‘higher predicate’ suffixes; tense/mood is a suffix that follows this. The following morpheme order in Mohawk is quite typical:

(32) ra-ˈwáhr-a-k-s-kwe’ (D&D:380)
    MsS-meat-Ø-eat-hab-past
    ‘he used to eat meat’

Aspect also follows the stem in Wichita, Kiowa, and Chukchee; it conditions the final vowel of the stem form in Nahuatl, and it is a suffix or a post-verbal auxiliary in Ainu. Tense and/or mood morphology follows aspect in Kiowa, Nahuatl, and some examples in Mohawk. Finally, tense/mood and aspect combine to form a single portmanteau in the Gunwinjguan languages; this portmanteau is a post verbal suffix. These generalizations are admittedly somewhat “noisier” than those involving incorporated noun roots: for example, tense/mood is a prefix in Wichita and sometimes in Mohawk, and it is expressed by a combination of prefix and suffix in Chukchee. There are also important details of the tense-aspect system in various languages that may be relevant. Since it is not my purpose to give a complete analysis of the tense-aspect system of any of the polysynthetic languages, I must put these concerns aside for the most part. Still, it seems clear that the order V-aspect-tense/mood is found much more often than chance. Thus, I assume that the tense/mood morphemes generally head a functional category ‘Inflection Phrase’ (InfP, or just IP), while aspect morphemes head a functional category ‘Aspect Phrase’ (AspP). The universal order of embedding is then VP inside of AspP, which is inside of InfP. This is the semantically natural order of embedding on most accounts, where tense and aspect are both operators over VP, with tense having scope over aspect (see for example Travis 1991, in preparation). Thus, a partial structure for (32) is (33):

(33)
Incorporation then proceeds successive cyclically from the bottom of the tree to the top, adjoining the head of each phrase to the left of the next head, in accordance with (31). This derives [N-V-Asp-Inf] as the unmarked word order, as observed.

The last type of morphology to consider is agreement morphology. This too is often treated as the head of a functional category in much P&P work since Pollock 1989. However, there are some problems with this proposal for the polysynthetic languages. First, agreement morphemes, unlike tense and aspect, are semantically vacuous; thus there is no way of locating them in a syntactic tree by investigating their scope with respect to other items. Second, and more importantly, this claim together with (31) predicts that agreement morphemes should show up as some kind of suffix. Exactly the opposite is true in polysynthetic languages: in the vast majority of cases, agreement morphology is prefixal, appearing early in verbal complex. This is consistently so in Mohawk, Wichita, Tanoan, Nahuatl, Gunwinjguan ((29a-e)); it is usually true in Ainu ((29g)). (One first person subject agreement is a suffix in Ainu.) The one problematic case is Chukchee, in which agreement is expressed by a combination of prefixes and suffixes ((29f)); this may be yet another instance of Chukchee’s unusual love of circumfixes. Moreover, in those cases where one can tell, subject agreement markers appear outside of object agreement markers. This is clearly so in Wichita, Nahuatl, and Ainu; it is also true for those combinations in Mohawk which can readily be segmented, like (34a).

(34) a. ye-sa-nūhwe’-s (D&D:385)
   FsS-2sO-like-hab
   ‘she likes you’

b. ya-nūhwe’-s (D&D:384)
   MsS/2sO-like-hab
   ‘he likes you’

Other combinations of subject and object agreement form portmanteaux in which order cannot reliably be discerned, at least in a synchronic sense, as in (34b). Portmanteaux are also typical of Tanoan and Gunwinjguan. Thus, the position of agreements seems to be principled in this class of languages, but not in a way that is consistent with the claim that they are X-bar theoretic heads. The principles developed so far converge on a simple proposal for what these agreements are. The fact that they are on the left side of the complex suggests that they are adjoined elements, placed by (31). The fact that they are relatively near the periphery of the morphological complex suggests that they are adjoined to heads that are relatively high in the structure. For these reasons, I assume that one agreement element (AGR) is adjoined to the Inf node; if there is a second, it is adjoined to Asp. This fits well with the familiar fact that there are dependencies between tense-aspect inflection and agreement in many languages. For example, subject agreement is missing on most infinitivals in Indo-European languages, a fact that motivated putting tense and subject agreement under the same
node in Chomsky 1981. Similarly, the agreement paradigms are somewhat different in different tenses in Chukchee and Nunggubuyu. Finally, there is one context in which tense/aspect morphology is generally not found on a verb stem in the polysynthetic languages: that is when the verb is incorporated into another verb (see chapter 8). In exactly this case there is no agreement morphology associated with the verb stem either. For concreteness, I will assume that the agreement factors are adjoined to Inf and Asp in the base. Thus, a fuller underlying structure for (32) is (35):

\[(35)\]

\[
\begin{array}{c}
\text{InfP} \\
\text{Inf} \\
\text{AGR Inf} \\
\text{past} \\
\text{AGR Asp} \\
\text{imperf} \\
\text{VP} \\
\text{NP} \\
\text{eat} \\
\text{meat} \\
\end{array}
\]

The head of the object noun phrase incorporates into the verb, and the derived verb then incorporates into Asp and Inf. In the latter two steps I assume that the moved item adjoins not to the left of the target category as a whole, but rather to the head of the target category. This means that the verb and the incorporated noun root (if any) show up to the left of Asp and Inf, but inside of the associated agreement morphemes, as desired.

I have stated (30) as a universal, but it is possible that it should be parameterized so as to say that moved heads adjoin to the left of the target category in some languages and to the right of it in others. This possibility is raised by interesting facts of Sora, a Munda language spoken in India, brought to my attention by David Stampe (personal communication). This language is polysynthetic in the informal sense; it also has productive noun incorporation where the IN is understood as referential. The following two sentences are essentially equivalent:

\[(36)\]

\[
a. \quad \text{BONt}l-\partial n-\partial d\text{ON jom-t-ε-ji} \quad \text{pO?}
\text{buffalo-nsf-acc eat-nonpast-3S-3pS Q}
\text{‘Will they eat the buffalo?’ or ‘Do they eat buffalo?’}
\]

\[b. \quad \text{Jom-bON-t-ε-n-ji} \quad \text{pO?}
\text{eat-buffalo-nonpast-3S-intr-3pS Q}
\text{‘Will they eat the buffalo?’ or ‘Do they eat buffalo?’}
\]

Thus, Sora is also polysynthetic in my technical sense. However, the IN follows the verb root, rather than preceding it as (30) predicts. This reversal is more general, as (37) shows (Donegan and Stampe 1983:341).

\[(37)\]

\[
\text{ñen Ʌd-Ʌd-l-jom-jel-yO-aj-t-en-ay.}
\text{I neg-want-eat-meat-fish-all-nonpast-intr-1sS}
\text{‘I don’t want to eat all the fish.’}
\]

Not only does the IN follow the verb root, but the higher predicate morpheme ‘want’ precedes it; meanwhile, the agreement morphology is the final suffix, and the quantificational element ‘all’ is an
intermediate suffix. In short, the order of morphemes in Sora is the mirror image of that found in the other polysynthetic languages. (The exception is the tense marker, which ought to be a prefix on this view; however, tense is the most common element to be out of position in the other polysynthetic languages as well.) These facts are elegantly explained if the direction of adjunction performed by head-movement is simply reversed in Sora.

We have now deduced most of the structure of the clause in these languages from their morphological structure. The most significant element that has not been placed by these means is the subject. What morphological structure tells us about the subject is mostly negative: it cannot incorporate, the way the object can. The other hint is that subject agreement typically appears outside of object agreement, as previously noted. These facts plus a bias in favor of assuming a relatively universal structure for the clause lead me to claim that in polysynthetic languages as in English the subject is more loosely attached to the clause than the object, which it asymmetrically c-commands. Exactly what position this is is still open; for the time being, I will assume that the subject is generated as the specifier of VP, as in most current work. These assumptions will be confirmed and elaborated in the chapters that follow, particularly chapters 5-8. In contrast, the details of clause structure are not particularly important for most of the material in chapters 2-4, so in those chapters I will often draw simplified structures from the era of S-->NP VP and VP-->V NP for convenience and clarity.

Some other representational conventions will be used as well. First, I will generally not show the base-generated internal structure of Asp and Inf, with AGRs adjoined to them; rather I will just write the AGR directly under the Asp or Inf head. Second, I will omit the specifiers of functional categories where they are not in use. Third, I will draw most of my phrase structures as if the polysynthetic languages were uniformly head-initial, SVO-type languages. There is no evidence that this is so: for the most part clause kernels consist entirely of traces and null pronouns whose order cannot be readily established. Indeed, some of the polysynthetic languages have head-final tendencies (Ainu, perhaps Kiowa). Nevertheless, the structures have to be drawn one way or another, and head-initial diagrams have two expository advantages: they are more familiar to some linguists, and they provide a clear non-string-vacuous representation of many head movements.

In closing, I would like to point out that if this account of verbal morphology in polysynthetic languages is more or less correct, it has some profound implications for the theory of morphology in general. Morphology has typically been considered the most idiosyncratic component of the grammar, with languages differing greatly in the expression and position of their morphological categories. This survey shows that much of the idiosyncrasy disappears when one carefully limits oneself to a narrow class of languages that are similar in their syntactic structure. Significantly, this account of the gross morphological structure in polysynthetic languages makes no use of some of the stipulative devices or delicate distinctions that are important in the morphological literature. For example, there has been no use of morphological subcategorization frames of the type introduced by Lieber (1980) to determine whether a given morpheme is a suffix or a prefix, or what kind of host it attaches to. These are fully determined by a combination of syntactic selection, the locality of head movement, and the stipulation that adjunction is always to the left. Morphological subcategorization frames are not even needed to force incorporation in this class of languages, because for the most part this will be forced by the MVC (see, e.g. chapter 7). Similarly, there is no need for morpheme templates or ordered rule systems (Anderson 1992) to determine the order of morphemes. We have not even needed to distinguish between derivational and inflectional morphology: noun incorporation and causative formation have traditionally been considered derivational processes, while tense and aspect are inflectional; nevertheless, the same ordering generalizations apply to both types of morphology. The analysis also speaks against a wide range of lexicalist theories of morphology, including Chomsky’s (1992) “checking theory”. Chapter 7 in particular presents new evidence that noun incorporation is a syntactic phenomenon. However, we have seen that noun incorporation is typically the first of the morphological combinations to take place. This then implies that all of the other morphological combinations are also performed in the syntax or later.
The view of morphology that emerges out of all of this is a very restrictive one, with some clear conceptual advantages. Principles like (31) begin to make sense out of how it could be possible for children learning a polysynthetic language to master both the word structures of their language (which are very complex) and the syntactic structures of their language (for which there is little other direct evidence). (31) makes this problem almost trivial by guaranteeing that over a large range of cases morphological order corresponds to morphological hierarchical structure, which in turn reflects syntactic hierarchical structure. Without such a principle, both the learning of such a language and the parsing of it would be very difficult.

It must be emphasized, however, that this is not a complete theory of morphology, even for the polysynthetic languages. First of all, the various polysynthetic languages have other morphemes which have no obvious role in the syntax, about which this theory says nothing. Some of these are only partially productive, derivational morphemes that appear close to the verb root (although these are not common in polysynthetic languages). Others are broadly speaking ‘modifying’, ‘adverbial’ or ‘quantificational’ in nature. Most of the so-called prepronominal prefixes in Mohawk fall into this class (s- ‘iterative’, meaning ‘again’ or ‘back’; y- ‘translocative, away’; t- ‘cislocative, toward’; te- ‘duplicative’, th- ‘contrastive’, etc.); Wichita and the Gunwinjguan languages are particularly rich in these. For the most part, they are prefixes rather than suffixes in all three families; thus their position and interpretation both suggest that they are base-generated adjoined modifiers of some kind. However, I cannot say more than this.

Even among the morphemes which this theory aspires to say something about, there are some minor variations in order and realization. I strongly suspect that there is no unified solution to this class of problems, but rather individual solutions for each case. In some cases, the difference in morpheme order probably is the result of a difference in underlying syntactic structure. For example, benactive applicative morphemes appear in one of two places in polysynthetic languages: they can be suffixes between the verb root and aspect, as in Mohawk and Nahuatl, or they can be prefixes between object agreement and the incorporated noun, as in Gunwinjguan, Ainu, and Wichita. Section 9.3 argues that the suffixes are actually incorporating verbs, while the prefixes are incorporated adpositions. A similar solution seems likely for the variable position of reflexive and reciprocal morphemes. Other variations in morpheme realization are obviously idiosyncratic, however, and call for a morphophonological analysis of some kind. The fact that 1st person intransitive subject agreement in Ainu is a suffix rather than a prefix clearly falls into this class; so too presumably does the fact that some tense/mood prefixes in Mohawk and all of them in Wichita are prefixes rather than suffixes. However, these irregularities are not fatal to a syntactically-oriented theory of morpheme order, as long as one adopts a framework which allows for “late lexical insertion” and a limited amount of readjustment in the postsyntactic component (see Halle and Marantz 1993 and related work). Which kind of solution is correct for any given case, and what constraints should be placed on the whole system are very important topics which are the subject of some current work and probably deserve more. However, they are not the topic of this book. Having now oriented the reader to the basic morphological and syntactic structures of these languages, it is time to start developing the main themes in earnest.
Notes

1 Sometimes such languages are called “nonconfigurational”. However, this is a blurring of two notions which are better kept separate; see Speas 1990 for discussion.

2 This work is presented in P&P terms, for a variety of reasons. Nevertheless, I have tried to make it accessible to people with a variety of backgrounds and theoretical tastes by avoiding terminology of narrow usage and by giving brief characterizations of the principles of the theory as they become relevant. Thus, while some general familiarity with the P&P framework will undoubtedly make the reading easier, I have taken for granted as few specifics as I could.

P&P theory has undergone a change of emphasis in the last few years, due to the proposals of Chomsky (1992); how far-reaching the change will prove is not yet clear. Under the circumstances, I have taken a somewhat eclectic approach, using both some ideas of the Minimalist Program and some ideas from earlier work that may not be strictly compatible with that program. Since my primary interest here is to generalize the theorems of P&P theory to a broader class of linguistic phenomena, the exact axiomization of the theory is not directly relevant, as long as the mid-level theorems are more or less unchanged.

However, it is not clear how to count members of a parametric cluster. For example, does the fact that Vs appear before adverbs and floated quantifiers in French (Pollock 1989) count as one fact or two? Should the fact that the equivalents of both who and what remain in situ in Chinese (Huang 1982) be counted as one fact or two? Probably there is no principled way to answer such questions in general.

1 See also Webelhuth 1992 and recent writings of Richard Kayne, among many others.

1 See appendix B for information about how to pronounce the Mohawk examples, and appendix A for an explanation of the abbreviations used in the literal glosses.

1 Indeed, this was considered to be another parameter in the sense of Chomsky (1981); these properties were the characteristic cluster associated with that parameter. Moreover, the cluster has experienced the same fragmentation as others; see, for example, Austin and Bresnan 1994.

1 See also Deering and Delisle 1976. In the (rather rare) cases where agreement on the verb does not identify grammatical functions unambiguously a sentence of the form NP-V-NP is usually interpreted as SVO rather than OVS (Mithun and Chafe 1979:11-12). It is not clear that this has any syntactic significance, however, and it is apparently not true for other, closely related languages (Mithun 1987).

1 Jelinek would not necessarily agree with all the details of the structure in (8). In particular, Jelinek 1984:50 does not distinguish VP from S, and attaches NPs to the basic clause by sister-adjunction rather than Chomsky-adjunction. I believe that (8) is faithful to her basic idea, however.

(8) is not exactly the structure used in Baker 1991a or the current work either; in particular, I assume that the agreement markers license pros in canonical argument positions, rather than literally being arguments themselves; see the discussion below.

1 This may in fact be a lexicalized compound, specific to Akwesasne Mohawk. My Kahnakwake consultant is not familiar with the word.

1 One important question left open here is whether there is a null subject (such as PRO) associated with the embedded VP in (10b). See sections 8.3 and 10.2.2 for discussion.

1 Given this, it has been suggested to me that the word ‘polysynthesis’ should be left as a general descriptive term and I should coin a new one for the class of languages I am concerned with, which is typically a proper subset of the languages called polysynthetic. Evans (personal communication) suggests the term “polysaturation” for the Mohawk class. However, I have not been able to tear myself away from the more familiar term.

1 For example, free word order in these languages seems to be due to syntactic movement (scrambling); see Saito 1985, 1990, Webelhuth 1992, and Mahajan 1990 for discussion. See also
Chamorro 1992:ch. 3 for a comparison of free word order and its correlates in Mohawk and Japanese/Hindi.

1 Of these factors, (c) is the hardest to judge on the basis of standard grammars, and it may turn out that some of the languages listed below actually fail this criteria.

2 This is a group of languages spoken in the western and central Arnhem Land area in the north of Australia. The name for the group comes from Evans (1991). A number of these languages which have been quite well described, and there are some nontrivial differences in their morphosyntax. Those which I have looked at are: Nunggubuyu (Heath 1980, Heath 1984, Heath 1986), Mayali (Evans 1991, Evans 1993), Rembarrnga (McKay 1975), Ngandi (Heath 1978), and Ngalakan (Merlan 1983). For the most part I will base my discussion on Nunggubuyu and Mayali, because the descriptions of these languages are more recent, more detailed, and in some cases more theoretically informed. Material from the other Gunwinjguan languages will only be cited when it fills out or corrects the picture formed by the first two in a significant way.

3 See also below for Sora, a Munda language of India.

4 Sapir (1911:262ff.) claims that Paiute is an exception to this generalization. However, it is not clear from his examples and discussion whether NI in Paiute is referentially active, or is can be analyzed as lexical compounding. It is also the case that Paiute pronouns cliticize into an auxiliary element, and this might be considered sufficient to pass the MVC; see the discussion of Chukchee auxiliaries in section 10.2.2.

5 The zoic gender frequently shows up as a zero morpheme. Nevertheless, the zoic morpheme is not systematically null; thus the agreement in (i) is distinct from that in (15):

(i) kuwa-núhwe’-s (ne takós)
  FsS/ZsO-like-hab NE cat
  ‘she likes it (the cat)’

See Baker 1990b for further morphological distinctions between zoic and neuter consistent with this analysis.

6 More specifically, these authors assume that the languages in question have null agreement morphemes. In chapter 5, I will argue that the facts of Mohawk are better understood if one says that the null morpheme has the status of an incorporated noun root instead; however, this issue is not essential to the point at hand.

7 Mohawk does have a few structures that look like (16d), but there is evidence that these are derived by ordinary compounding rather than by incorporation; see section 7.4.

8 The prefix bi- is a special form of 3sS/3sO agreement which is used when the object is higher on an animacy hierarchy than the subject; see Evans 1991:205-209 for details. The important thing is that this prefix is not identical to any used on purely intransitive verbs.

9 This possibility was not considered in Baker 1991a, where I took for granted the presence of agreement morphology.

10 Here I put aside the well-known case of inflected infinitives in Portuguese. Such constructions could perhaps exist in polysynthetic languages, but they would not necessarily be identified as infinitival forms in descriptive grammars. A possible case in point are the so-called participle forms in Wichita: Rood (1976) sometimes refers to as nonfinite, but they still have full agreement with the subject.

11 Chukchee looks like a counter-example to this claim, but there is some evidence that what is commonly called the infinitive is in fact a kind of nominalization; see Bogoras 1922:784-788 and section 10.2.1.

12 However, a nonpolysynthetic language could lack an infinitival verb form simply because its lexicon does not have a [-finite] Infl. This would be a microparameter. Modern Greek is a language of this type (Terzi 1992).
The same affix can sometimes attach to transitive verbs with an instrumental meaning, however; see Lounsbury 1953.

Shibatani (1990) refers to rusuy ‘want’ as an auxiliary, and leaves a space between it and the preceding verb root, as in (i).

(i) Icen ku-kon rusuy. (p. 77)
money 1sS-have want
‘I want to have money.’

However, it is striking that whenever agreement is a prefix it attaches to the first verb, and whenever it is a suffix it attaches to the second verb:

(ii) Wakka-ku-rusuy-an. (p. 78)
water-drink-want-1sS
‘I want to drink water.’

This strongly suggests that rusuy and the preceding verb root form a morphological constituent after all—a fact perhaps obscured by the fact that Ainu has relatively little internal sandhi.

Adopting Kayne’s proposal in full generality would require a major rethinking of the status of right dislocations and verb initial orders in the polysynthetic languages. The problems this faces are no worse than the ones Kayne himself considers, but they are no better either. See chapter 3, particularly 3.3.1, for some relevant discussion. See also below for possible evidence of parameterization in this respect.

Note that this is comparable to the position of clitics in Romance, but not to the position of true subject agreement or participle in Romance, as pointed out to me by Sportiche (personal communication). Agreement in polysynthetic languages has other properties similar to those of clitics in Romance; for example, they absorb Case features (see section 2.2). These similarities merit further consideration. However, agreement morphemes in these languages are clearly prefixes rather than clitics in the morphophonological sense.

The question of whether or not AGR is adjoined to functional categories in the base becomes meaningless if one implements Chomsky’s (1992) proposal that the phrase marker is built up step by step by Generalized Transformations; then there is no ‘base’ in the usual sense. One could also say that AGR factors are added to the edge of an appropriate functional category as soon as incorporation into that functional category has taken place in the course of building up the structure.

This assumption might also provide a way of analyzing the circumfixes in Chukchee. Suppose that these are two part morphemes, where one part is considered the head, and the other part is adjoined to it, something like verb-particle combinations in Germanic languages. Then when something incorporates into such a morpheme, it will show up between the two parts. Moreover, the suffix part of the circumfix (i.e. the head part) will be in the same relative position in the final verb complex as conventional morphemes are in other languages. This seems to be a correct generalization for Chukchee.

This is compatible with Donegan and Stampe’s (1983) view that very general principles of ordering pervade languages as a whole; they also point out a possible historical explanation based on the relationship of Munda languages to the head-initial Mon-Khmer languages. Unfortunately, it is difficult to find material on Sora and I learned of its relevance in the final stages of preparing this work, so it is not possible to include it in the rest of the discussion.

For Mohawk an autosegmental solution to this problem may be possible: the mood categories show up as the vocalism in a prefix template determined by the adverbial preverbal prefixes. Hence, they may be floating segments underlyingly. See Lounsbury 1953 for a description of the facts and Rose in preparation for a partial account.