

Chapter One

The Agenda of Morphology

1. SETTING OUR BEARINGS

Morphology is superficially the sum of all the phonological means for expressing the relations of the constituents of words, of words in phrases, and of the phrasal constituents of sentences. The key element of morphology is the **WORD**, a symbol comprising mutually implied sound and meaning. The central purpose of morphology, therefore, is to map sound to meaning within the word and between words. The issues of morphology are what constitutes linguistic sound, what determines linguistic meaning, and how the two are related. Since these questions are central to the linguistic enterprise in general, morphology should be the centerpiece of language study. Yet, instead of gravitating to the center of linguistics during the recent Generativist revolution in language studies, in the past few decades morphology has all but vanished from the agenda of linguistic inquiry.

One reason for this malaise of the discipline is the unresolved flaws in the European Structuralist model of morphology inherited by Generativist theory—zero morphology, empty morphology, morphological asymmetry. Perhaps for this reason, the Generativist tradition has yet to find a firm place for morphology in its theoretical models. Indeed, some Generativists argue that morphology does not even exist outside the general principles of syntax and phonology, and the storage capacities of the lexicon. The reason for the underestimation of morphology's contribution to the sentence is the Generativists' simple view of the morpheme. From Plato to Baudouin, the word was taken to be the smallest linguistic sign. Since Baudouin, however, "the minimal meaningful unit of language", has been the **MORPHEME**, the sublexical constituent of words. While the status of the word as a linguistic sign is uncontroversial, the term "word" itself has defied all attempts at definition; indeed, this recalcitrance prompted the original interest in the proposition that morphemes are the primitive linguistic signs. The result is a genuine quandary: morphemes fail to behave consistently like signs and words defy definition.

The second reason for the malaise in the discipline is that while the word and morpheme have two sides: the semantic and phonological, only for a brief period in the 19th century did research treat both sides evenly in any attempt to account for the relation between the two. The initial interest of the Greeks centered exclusively on the semantic side of words, their various categories and subcategories. Over the centuries interest slowly shifted, not to a balanced scrutiny of the meaning and sound of morphemes, nor to the crucial relation between the two, but rather to the exclusive study of the phonological side of morphemes that dominated the Structuralist school.

The next section, a brief overview of this historical shift, outlines this imbalance and provides a frame of reference for the present work. The central issues and assumptions of morphology, which this book will address in subsequent chapters, will be drawn from this historical survey.

1.1 A BRIEF HISTORY OF MORPHOLOGICAL STUDIES

The Stoic philosophers (Diogenes Laertes, Apollonius) first defined the word as a bilateral association of “the signifier” (τὸ σημαῖνον) and “the signified” (τὸ σημαίνόμενον). The Greeks did not analyze the word; they considered the word the smallest indivisible meaningful linguistic element. They used the formal regularities existing between words only as clues to grammatical and semantic categories. They defined the lexical classes, noun and verb (including adjectives among the former), and undertook the first investigations into Gender. Aristotle advanced these studies with his definition of words other than nouns, verbs, adjectives, and adverbs as “conjunctions” or “connectives” (σύνδεσμοί). He defined this latter class in terms of their relational functions and their lack of referential meaning in isolation. This distinction is an important one that will be restored and refurbished in the next chapter.

The Classical Greek philosophers then focused on the categories expressed in words without formally analyzing words. This fascination with semantic categories continued in Alexandria even though the Alexandrian grammarians are credited with converting language study from a subdiscipline of philosophy to an independent “technical” discipline. The Alexandrians expanded the number of recognized grammatical categories, defining them in terms of the formal characteristics of their inflectional paradigms as well as their referential properties.

Aristarchus and Dionysius Thrax categorized words into the canonical eight parts of speech, but their categories, too, were restricted to whole words, and did not include any analysis of sublexical elements. By the time of Dionysius, the Alexandrians had identified three Tenses (Present, Past, Future), two Aspects (Perfective, Imperfective), and three Voices

(Active, Passive, Middle) among verbs. Dionysius reported 22 subclasses of nouns: proper, collective, generic, specific, appellative, and so forth; three Genders: Masculine, Feminine, Neuter; three Numbers: Singular, Dual, Plural; the five Cases: Upright, Generic, Dative, Causal, Vocative; two species: primitive and derivative, which had seven subspecies: patronymic, possessive, comparative, superlative, hypocoristic, denominal, and deverbal; and three shapes: simple, compound, and double compound. The Alexandrians did not associate these categories with distinct morphemes; rather, they simply sorted out whole words with inflectional variations expressing these categories. However, the individuation of all these categories laid the foundations of our understanding of lexical behavior across the succeeding centuries.

The Latin grammarians continued the Greek tradition with greater dexterity. In *De Lingua Latina* (47–45 B.C.), Marcus Varro classified the major parts of speech according to two properties: Case or Tense. Assuming much like Chomsky (1981) that either of these properties could be absent or present in a form, he came to the very modern conclusion that Latin has four major categories, not the N, V, A, P yielded by [$\pm N$, $\pm V$], but (i) nominals (Ns and As), which he might have symbolized as [+Case, –Tense], (ii) verbs, [–Case, +Tense], (iii) participles, [+Case, +Tense], and (iv) adverbs, [–Case, –Tense].¹

Varro also distinguished attested from potential paronyms, noting that *unguentum* ‘‘perfume’’ has a Plural *unguenta* because of the existence of several kinds of perfume. Were similar differences in the kinds of olive oil and vinegar to arise, so would Plurals *olea* ‘‘olive oils’’ and *aceta* ‘‘vinegars’’. However, Varro is perhaps best known for his discussions of the extensive violations (*anomalía*) of derivational regularity, for instance, the indeclinable nouns, the irregular Comparatives like *bonum*, *melius*, *optimum*, and derivational irregularities like those of (1.1):

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|-------|----|------------------------|-------------------------------|
| (1.1) | a. | vin-um ‘‘wine’’ | vin-aria ‘‘wine shop’’ |
| | b. | unguent-um ‘‘perfume’’ | unguent-aria ‘‘perfume shop’’ |
| | c. | car-o ‘‘meat’’ | *carn-aria ‘‘butcher’s shop’’ |

Instead of the expected *carnaria*, the word for ‘‘butcher shop’’ in Latin is *laniena*. So the discovery of lexical exceptions to morphological patterns is ancient, indeed.

Despite their interest in paradigms, the Latin grammarians, like their predecessors, explored sublexical derivational properties only minimally and focused most of their efforts on the categories and etymologies. Problems such as those listed in (1.1) were not discussed in terms of differences in affixation; rather, the major categories were seen as whole words with ‘‘flexible ends’’, the concept which underlies the current term, ‘‘inflec-

tion". Not until Priscian (*Institutiones grammaticæ*, Books 9–10) do we find rules predicting inflected forms. Even here the rules predict the form of a whole word from that of another whole rather than from the behavior of sublexical elements. For example, Priscian's rule for the Past Imperfective is as follows (from Kiel, 1857–1870, II, 457–58: quoted here from Matthews 1972: 10–11, my translation):

præteritum imperfectum . . . a præsentis fieri sic: in prima quidem et in secunda coniugatione et quarta in "eo" desinente a secunda persona ablata "s" finali et addita "bam": "amas amabam", "doces docebam", "is ibam"; in tertiæ vero omnibus verbis et quartæ in "io" desinentibus prima persona mutat "o" in "e" productam et assumit "bam": "lego legebam", "facio faciebam", "venio veniebam".

The Past Imperfective . . . is formed from the Present like this: for the 1st and 2nd Conjugation and the 4th Conjugation ending in *eo*., the final *s* is deleted from the 2nd Person and *bam* is added: *amas amabam, doces docebam, is ibam*; for all verbs in 3rd Conjugation, however, and [those of] the 4th in *io*, *o* is changed into *e* and *bam* is added: *lego legebam, facio faciebam, venio veniebam*.

Primary interest here focuses on disambiguating the categories themselves rather than on the allomorphy of the "accidents" of ending which symbolized them.

The study of the word strayed little beyond the accomplishments of the Latin grammarians throughout the Middle Ages and Renaissance. From a contemporary perspective, one might question how much morphological study had in fact been conducted up to this point, since the means of signaling categories generally remained all but wholly beyond the pale of interest. Reuchlin (1506) finally introduced the analysis of words in terms of roots and affixes to European audiences, a practice he had observed in the works of the Hebrew grammarians. In a more influential work a century and a half later, Schottelius (1663) extended Reuchlin's division by distinguishing *Stammwörter* STEMS, *Hauptendungen* MAIN (= derivational) ENDINGS, and *zufällige Endungen* ACCIDENTAL (= inflectional) ENDINGS, thereby recognizing differences in inflection and derivation for the first time.

Schottelius' work began a shift toward a balanced study of the signified and the signifier. By and large, however, morphological research did not advance beyond the work of Reuchlin and Schottelius until the turn of the 19th century, when the discovery of the Hindi grammarians generated an interest for formal decomposition. The Indian grammars from Pāṇini's *Aṣṭādhyāyī* (ca. 500 BC) on distinguished derivation and inflection. They contained formal rules governing the behavior of sublexical elements, for example, Pāṇini's AFFIXES (*pratyaya*) and AUGMENTS. Pāṇini's affixes

could be replaced before the surface level or deleted to accommodate zero morphology; empty realizations were also possible. All these wonders began to emerge in European word study on the wave of proofs that Sanskrit was related to the languages of Western Europe, which culminated in William Jones' famous report to the Royal Society in 1786.

Von Humboldt (1836) turned attention outside the IE family, introducing infixation and incorporation to European theoreticians. Since these new types of morphology are formally, not categorially, distinguished from other types of morphology, von Humboldt was led to conclude that the variation in the SOUND FORM (*Lautform*) is the primary element distinguishing languages. Thus the first language typology, von Humboldt's isolational, agglutinative, and inflectional types, is based exclusively on formal distinctions. Morphology had become a fairly clear component of grammar and its formal side, an accepted fact. Schleicher (1859) next produced the first formal theory of morphology. A forewarning of things to come, it dealt solely with the possible structural relations of affixes and stems as a basis for predicting language typology.

The influential work of von Humboldt and Schleicher, however, did not spell the end of categorial studies. Neogrammarians like Brugmann and Delbrück consistently discussed both the form and the grammatical functional categories associated with them in their monumental works at the end of the 19th century. The Neogrammarians, in fact, first distinguished lexical classes (N, V, A, Adv) from the categories of grammatical functions, for example, Number, Person, Gender. Indeed, the brief Neogrammarian period represents the apogee of morphological studies balancing concern for content with that for form. The phenomenon was short-lived, however, for the Structuralist school accelerated the shift away from the study of morphological categories to the exclusive study of the allomorphy.

The Structuralists' point of departure was the Classic assumption that the relation of all lexical and morphological sound to meaning is direct, mutual implication; Saussure even adopted the Greek terms, "signifier" and "signified." Baudouin then combined the Greek concept of the sign with the newly discovered sublexical units to reorient the definition of the sign from the word as a whole to its sublexical elements. Baudouin placed roots, affixes, and inflectional endings into a single natural class, which he called, for the first time, "morpheme". He originally defined his new concept as "the simplest psycho-linguistic elements in the guise of sound" (Baudouin de Courtenay 1889). But in Baudouin de Courtenay (1895), he refined this definition to "that part of the word which is endowed with psychological autonomy and for that reason is not further divisible" [tr. E. Stankiewicz (1972)]. Baudouin, therefore, not only distinguished sub-

lexical units; he raised the status of affixes to that of the stems that bear them, defining both identically.

Saussure, mindful of the problems with Baudouin's definitions, carefully avoided the term "morpheme" in his lectures and associated his definition of the sign only with words. Bloomfield, however, carried Baudouin's definitions even further. Having shifted the classical definition of the word as a bilateral sign to the morpheme, Bloomfield then took the next logical step, to place all morphemes in the lexicon, previously the storage component of words (Bloomfield 1933, 161–63). Bloomfield's overall vision of morphology included (i) Baudouin's Single Morpheme Hypothesis, which unifies all sublexical elements under the single rubric "morpheme"; (ii) the Sign Base Morpheme Hypothesis, which defines all such morphemes as signs, directly related associations of form and meaning; and (iii) Bloomfield's own Lexical Morphology Hypothesis, which locates all such morphemes in the lexicon, where they are subject to the same selection and copying processes, without distinguishing the behavior of stems from that of affixes. This cluster of independent assumptions will be referred to throughout this book as the LEXICAL MORPHEME HYPOTHESIS (LMH), a hypothesis that dominates the contemporary language sciences.

Simultaneous to listing grammatical morphemes in the lexicon, Bloomfield denied any relevance of semantics to the study of linguistics. This step led to an abrupt shift of interest away from morphological categories altogether to Trubetskoj's MORPHOPHONEMICS, allomorphy pure and simple. When Nida completed the first structuralist treatise on morphology (Nida 1946), it represented little more than a set of discovery procedures for isolating affixes and determining their allomorphy. It simply ignored the categories that affixes express.

Not all thinkers were unaware of the problems with the structuralist assumptions. Saussure (1916) pointed out the fundamental contradiction of ZERO MORPHS to his theory of the linguistic sign and the complications in defining the word raised by compounds and contractions (one word or two?). In 1929 Karcevskij discovered MORPHOLOGICAL ASYMMETRY in Russian inflection: the same ending may mark more than one grammatical function, while any given function may be marked by more than one ending. The inflectional ending *-a* in Russian, for example, marks NomSg-Fem, GenSgMas/Neu, and NomPlNeu. It is therefore multifunctional. On the other side, each of these Case functions, say, NomSg, is marked not by one, but by a set of endings: NomSgFem = *-a*, NomSgMas = \emptyset , NomSgNeu = *-o*. Karcevskij saw a major problem for sign theory in this since such patterns are not found among stem morphemes.

Bazell examined many problems with the structuralist approach to morphology: asymmetry, zero morphology, the bias in favor of form. His

most enlightened criticism identified THE CORRESPONDENCE FALLACY, the presumption that an analysis at one linguistic level isomorphically corresponds to the analysis of the same object at other levels. Examining the problem of morphological asymmetry discovered by Karcevskij, Bazell (1949, 1952) argued that it follows neither that the phonological analysis of a word will isomorphically correspond to the semantic, nor that, because of this, no analysis is possible. Bazell chided attempts to conceive of such morphemes as the English Past Tense marker in *sang* as an ablaut variant of the suffix *-ed*. It does not follow from the fact that these two markers express the same grammatical function, he reasoned, that they are identical at any other level. It is quite possible that each level is defined in its own terms (in which case a set of principles mapping one level to the other will be required of linguistic theory).

Despite the catalogue of problems facing sign-based morphology compiled by Bazell, Saussure, and Karcevskij, neither Structuralism in its decline nor Generativism in its rise addressed the shortcomings of Bloomfield's assumptions. In its first two decades, the Generative Revolution ignored morphology. Aronoff's dissertation on derivational morphology (Aronoff 1976) was published 19 years after Chomsky's *Syntactic Structures*. It is true that the Natural Phonology movement of the late 1970's (Hooper 1976) was a response to the level of abstraction allowed by the allomorphy of Chomsky and Halle (1968). However, initial concern focused primarily on phonological issues of allomorphy rather than the elementary questions of morphology. Recent schools of GB morphology, such as Lexical Morphology and Autosegmental Morphology, started out as Kiparsky's Lexical Phonology and the Autosegmental Phonology of Goldsmith, respectively. Neither of these theories deals with meaning explicitly, though meaning is curiously the basis of the determination of formal units. Both theories assume Bloomfield's three principles on the nature and place of morphemes in grammatical theory (LMH).

The history of morphological studies, in conclusion, teaches us that the critical objects of morphological research are lexical and grammatical categories, sublexical phonological constituents and, crucially, the relation between the two. The course of this history has witnessed a shift from the exclusive study of categories to an exclusive study of formal elements. Only very recently, and only in the work of a handful of contemporary morphologists, has morphological research returned to a balanced study of both form and function (see Carstairs-McCarthy 1992a: chapter 6); however, the question of the relation between categories and exponents remains largely unexplored terrain.

1.2 A SURVEY OF CURRENT AGENDAS

Having surveyed the history of word studies from the Greeks to modern times, the next step is to examine current research programs in morphology

to determine our bearings. To redress the current imbalance in allomorphic and semantic studies of morphology, we need first to understand that imbalance as it presently stands. This section, therefore, will review current research programs in morphology with a view toward assessing their contribution to the core concern of morphology: the relation of linguistic sound and meaning.

Recent work in morphology has, by and large, continued the Structuralist emphasis on allomorphy, though some studies have returned to the issue of grammatical categories. Carstairs-McCarthy (1989) refers to the Structuralist approach as the "bottom-up" approach, because it focuses on phonological issues at the expense of semantic ones. The "top-down" approach focuses on the semantic side of morphology or, more correctly, on the combinations of grammatical categories which grammatical morphemes, inflectional and derivational, mark. Those who approach morphology from either direction seldom deal with the whole morpheme, sound and meaning. "Bottom-up" and "top-down" frameworks usually focus on the phonological or categorial side of the morpheme, respectively, without reference to the other, the most common assumption being that the two are simply directly associated with each other.

Research in morphology associated with the GB school of grammatical studies all share in the common basic assumptions of the LMH mentioned in the discussion of Bloomfield above. Lieber (1981a: 35) claims, for example, that "affixes differ from non-affix morphemes only in that affixes have as part of their lexical entries, frames indicating the category of items to which they attach as well as the category to which they belong". She emphasizes also that "especially important for the theory to be developed below is the fact that lexical entries for affixes are identical to lexical entries for non-affix morphemes, except for the presence of sub-categorization information in the entries of the former" (37).

The appeal of this hypothesis lies in its simplicity: it provides only one basic grammatical element, the morpheme, which is more or less isomorphic with referential terms and predicates. This element is stored in a single component, the lexicon, and is copied into words and phrases by the same simple selection rule that interprets the symbol of a minimal projection and copies an appropriate lexical item onto it from the lexicon. The assumption that affixes belong to the same categories as stems (N, V, A) and are inserted like stems, allows lexical derivation to be conflated with compounding. That is, the copying of a prefix into a derivation is the same process as adding an attribute to a noun to form a compound: *do* → *undo*, *boat* → *houseboat*.

The simplicity of this approach, in fact, is such that Pesetsky (1985), Sproat (1985), and Di Sciullo and Williams have concluded that the lexicon does not contain a rule component. Rather, the lexicon is boring: "The

lexicon is like a prison—it contains only the lawless, and the only thing that its inmates have in common is lawlessness” (Di Sciullo & Williams 1987: 3).² The principles of derivation and inflection, the inheritance of category features, subcategorization frames, and the like, are those of syntax. The lack of research into the nature of grammatical categories in the published accounts of GB morphology is thus justified by the assumption that grammatical categories differ in no way from those of syntax.

1.2.1 Level-Ordered (Stratal) Morphology

Kiparsky (1982), Halle and Mohanan (1985), Booij and Rubach (1987), and Inkelas (1993) have sought to develop morphological and phonological systems void of diacritic features like [\pm Latinate], while explaining the different types of phonological changes that take place at the boundaries of Latinate and native affixes in English. English, for example, has two negative prefixes, the Latinate (*in-*) and the native (*un-*). When attached to stems, the Latinate prefix undergoes assimilation across a broad range of consonants, for example, *immovable*, *incorrect* ([ɪŋkərəɛkt]), *irrelevant*, *illegal*, to which *un-* is not susceptible, as in *unmoved*, *uncompromising*, *unreal*, *unlikable*. Chomsky and Halle (1968) posited two types of boundary, a morpheme boundary “+” and a word boundary “#,” stipulating that the lexical representation of *un-* would be /ən#/ and that for *in-* would be /ɪn +/. Since “#” was a word boundary marker, only postcyclic phonological changes which occur across word boundaries were allowed between *un-* and its stem, while morphophonemic alternations were allowed across the morpheme boundary “+.”

Although Chomsky and Halle distinguished two types of boundaries, they could not account for a major generalization: while word-boundary affixes may be attached to both word-boundary and morpheme-boundary (Latinate) affixes, it is not generally possible to attach morpheme-boundary affixes to word-boundary (Germanic) affixes. For example, the suffix +*ion* motivates morphophonemic changes in the stems to which it attaches: *submit* : *submission*; *deride* : *derision*, so it must be assigned a morpheme boundary. The native suffix #*ing*, on the other hand, does not, so it needs a word boundary: *ride* : *riding*; *roll* : *rolling*. Consequently, while it is possible for #*ing* to occur outside +*ion*: *positioning*, (*air*) *conditioning*, *requisitioning*, +*ion* cannot occur outside #*ing*.

Allen (1978) proposed that rather than distinct boundaries, affixes are attached at different levels of derivation, so that morpheme-boundary affixes simply attach to stems at an earlier stage of derivation than word-boundary affixes. Phonological rules apply cyclically so that all phonological rules relevant to a given affix apply immediately upon attachment, before the next affix is copied. This is accomplished by Kiparsky’s BRACKET ERASURE PRINCIPLE, which erases the brackets around an affix when all P-

rules relevant to it have applied. P-rules continue applying inside brackets until all brackets are erased. Level I affixes require allomorphic operations; they are inserted at a higher level than those affixes which involve only regular phonological alternations and no allomorphic ones. This ordering captures the generalization that the “+” boundary affixes tend to occur closer to the stem and not outside a “#” boundary affix without postulating different types of boundaries. This approach is called STRATAL MORPHOLOGY.

Stratal Morphology raises the question of whether there are different classes of operations on morphemes and whether they affect the order of affixes in lexical and inflectional derivations. Notice that this brand of morphology speaks only to the issue of the order of these CLASSES of affixes or operations, not to the order of specific affixes within those classes. For example, while Stratal Morphology predicts the order of the set of cyclic suffixes like +ion, +ous, +ity vis-à-vis the set of noncyclic suffixes like #er, #ing, #en, it does not predict the order of the affixes within these sets, for example, why we find derivations with +ous +ity (*generosity*) but not *+ous +ion, e.g. **generosion*. The predictions of Stratal Morphology are thus very general and require further specification to be useful.

1.2.2 Word-and-Paradigm Morphology

Matthews (1972, 1991) and S. Anderson (1982, 1992) argue for a separation of inflectional affixation from the “morphological representations” (grammatical feature inventory) of lexical items. These advocates of WORD-AND-PARADIGM (WP) morphology argue for unordered morphosyntactic features in the morphological representation and the application of unordered realization rules which attach affixes or otherwise modify a lexical stem (reduplication, metathesis, and so forth). Affixation is therefore the result of operations on stems, rather than listed items. Although Matthews and Anderson offer theories of mapping of morphological to phonological representations, they say little about the nature of the categories featured in those representations.

Matthews developed the classical WP approach to morphology by refining and elaborating the rules of Priscian’s *Institutiones Grammaticæ*. From this Classical point of departure, he developed a formal model particularly adept at handling the problems encumbering sign-based morphology pointed out by Karcevskij and Bazell: morphological asymmetry, and null and empty morphology. In place of an ordered arrangement of morphological functions for a Latin form like *ferrī*, such as, [FER- + Infinitive + Passive], Matthews proposes a simple statement of unordered morphological features like “the Passive Infinitive of FER0” (Matthews 1972: 106). Independent phonological operations interpret these features. One such realization rule might be: “the terminal ending (or Termination) -i: is

selected if the word is characterized by the elements Ist, Singular, Perfective and Present Indicative'' (Matthews 1972: 107–108).

An interesting claim of WP morphology is that the ordering of inflectional desinences is a matter of language specific morphotactics. Moreover, contra the MIRROR PRINCIPLE of Baker (1985), morphological features are not mapped one-one onto affixes in fusional languages as they sometimes seem to be in agglutinative languages. Rather, inflectional derivations are built up from stems by algorithmic operations, which may map one feature onto two or more affixes or more than one feature onto one affix. Matthews, however, is careful to explain that his WP framework may be valid only for fusional languages; an Item-Arrangement or Item-Process model may be better suited for agglutinative languages. Affix order can be crucial in agglutinative languages like Turkish: *Türk-ler-dir* means 'they are the Turks' while *Türk-tür-ler* means 'they are Turkish.' Here the order of affixes seems to isomorphically follow that of the morphosyntactic features. Hence the cost for Matthews' compelling solution to the problems of fusional morphology may be the universality of his model.

Anderson's A-MORPHOUS MORPHOLOGY is an extension of what was previously called the EXTENDED WP MODEL (Anderson 1982). Anderson (1992) returns to the Aspects model of syntax (Chomsky 1965) in postulating terminal syntactic nodes with complex symbols containing just those category features necessary for inflection: Number, Gender, and Case features for nouns, Person, Number, and Tense features for verbs. This provides a source for the morphosyntactic feature representation that Matthews assumed. Anderson maintains Matthews' claim that the features of a morphosyntactic representation are unordered, but adds that they are LAYERED; that is, they accumulate in ordered layers. This accounts for languages like Turkish, where some affixes are ordered vis-à-vis each other, but others are not. Features within layers trigger those affixes whose order is irrelevant; features ordered with respect to each other trigger ordered affixes. Anderson in particular notes that layering accounts for the ordering of Subject and Object agreement in languages which maintain both. The order of the pronominal affixes more often than not determines whether they are coindexed with the Subject or Object position.

Derivational morphology and compounding are processes altogether different from inflectional processes in the WP model. Because they see differences in productivity and rates of idiomacity radically different among lexical and inflectional derivates, Matthews and Anderson assign lexical derivation exclusively to the lexicon. This was a major issue in the 1960's and 1970's in Europe; Fleischer, Dokulil, Kubriakova, Vinogradov, Zemskaia, and many others have written extensively on it, generally concluding that the two morphologies are distinct but without establishing clear and reliable criteria for distinguishing them. Perlmutter (1988)

dubbed this hypothesis the SPLIT MORPHOLOGY HYPOTHESIS. Since the origin of morphosyntactic features is syntax and word formation processes operate from the lexicon, the WP model with Split Morphology accounts for the distinction of inflection and word formation. It also accounts for the LEXICALIST HYPOTHESIS (= Lexical Integrity Principle), that the operations of syntax have no access to the internal structure of lexical items.

WP morphologies raise at least three fundamental issues. First, is there a universal order of (derivational and) inflectional morphemes and, if so, what determines that order? Matthews denies a universal order of fusional morphemes but leaves the door open for a model of agglutinative morphology that might specify order. Anderson provides layered morphological representations, which can accommodate both strictly ordered and unordered markers. Second, what is the relation between morphological expression and the category it expresses? If the relation is not everywhere homomorphic, there must be more than one derivational level and a set of principles for mapping one level onto the other, principles which account for ordering and scope differences between levels. Matthews was the first to explore the indirect articulation of grammatical categories in inflection and to postulate mechanisms for mapping between the categorial and phonological levels. Finally, is inflection radically distinct from lexical derivation and compounding? Although much has been written on this subject, it remains an unsettled issue.

1.2.3 *The Morphological Structure of Word Syntax*

Word Syntax raises the question of whether lexical rules and morphology exist at all. Rather than special lexical rules constraining derivational and inflectional operations, Word Syntax proposes that the principles of GB syntax constrain them. Baker (1988a, 1988b), Lieber (1981a, 1983, 1992), Roeper and Siegel (1978), Roeper (1987), Scalise (1984), Selkirk (1982), Di Sciullo and Williams (1987), and Halle and Marantz (1993) argue that word formation processes are constrained by argument structure inherited from the stem plus the principles of GB syntax. Selkirk, for example, claims that internal (Object) arguments of verbs in compounds must be satisfied in a compound just as they must be satisfied in a VP. Moreover, just as an external (Subject) argument cannot be satisfied within the VP, it also cannot be satisfied within a compound. Hence **tree-eating of pasta* is ruled out because the Object, *pasta*, must be satisfied within the compound. By the same principle, **girl-swimming* is ruled out because *girl* must serve the function of Subject in the compound. *Pasta-eating in trees* is perfectly acceptable.

To account for the lexical categories of derived words, Williams posited his controversial RIGHT-HAND HEAD RULE, that the rightmost element of derivations and compounds is always the head and categorizes the neolo-

gism, for example, [*re*[*read*_V]]_V, [*house*_N[*boat*]_N]_N, and [*bak*_V[*er*]_N]_N. He takes advantage of the status of affixes as listed objects with its implication that affixes belong to the same lexical classes as do stems. It follows that affixes are the lexical heads of derived words. It also follows that prefixes will not change the category of the stems to which they attach, as suffixes do. By and large, this prediction is realized in English and a few other languages, but not in predominantly prefixing languages like Yoruba or left-branch compounding languages like Vietnamese.

Recent Word Syntax studies have focused on thematic relations (Agent, Patient, Recipient) of argument structures for which verbs subcategorize. They have shown that these relations must be inherited by derivations or compounds from their underlying bases and that such inheritance precludes any further use of them by syntax in the phrase. For example, the Agentive sense of *driver*, by these accounts, derives from the Agent relation in the argument structure of *drive*: [Agent ____ (Theme)]. Once an argument role is linked to an affix by derivation, as [Agent] is linked to *-er* in this case, it is unavailable for further lexical or syntactic service. *Man-driver* should not be interpretable as ‘‘a man who drives’’ since the Agent argument of *drive* has been assigned both to the suffix *-er* and, in the compound attribute, to *man*. The same applies to the syntactic construction *a driver of a man* where *man* and *-er* would also have to be assigned the same Agent argument. *Truck-driver* and *the driver of the truck* are acceptable since *truck* is assigned the unoccupied Theme (Patient) role in either case.³

Some recent Word Syntax literature has gravitated toward proof that word formation and inflection do not exist as discrete components of grammar, that is, do not possess their own rules and categories. Sproat (1985), Baker (1988a), and Lieber (1992) argue explicitly that the principles of morphology are just those of GB syntax applied to lexical structure. Word Syntax is of interest, therefore, because it focuses on the categories of morphology and what determines them. It thereby complements the theoretical work of the allomorphic research of Stratal Morphology also conducted within the GB model, and certainly frames two of the major questions on the agenda of morphology: do words have internal structure? and are the terminal elements in all that structure lexical items?

1.3 SEPARATING THE CENTRAL FROM PERIPHERAL ISSUES

Argument linking and inheritance, on the one hand, and autosegmental representations and level ordering, on the other, raise issues of constraints on the categorial and formal sides of morphology, respectively, and must be dealt with in the chapters to follow. However, these treatments of categories and allomorphy do not get at the central issue of morphology: the

relation between the two. Because morphology bridges the levels of meaning and sound, this issue is paramount to morphological research. How is it that phonological expressions convey meaning when we speak? What are the constraints on the mapping of meaning to sound at the atomic level? This issue is not a trivial one because the widespread occurrence of zero and empty grammatical morphemes brings sign theory itself into question in ways which cannot simply be ignored as they have been in the recent past.

The literature up to now has revealed several types of morphological objects and operations. Lexemes, morphemes, stems, and roots are the fundamental objects of morphology, while the most salient operations are derivation, conversion, transposition, compounding, affixation, revowelling, reduplication, contraction, and metathesis. No complete list of grammatical categories has been compiled and the number seems to be quite large though closed. The list would include such expressive derivational categories as Diminution, Augmentation, Pejorativity, Affection, and functional categories such as Subjective (*baker*), Objective (*employee*), Instrumental (*mixer*), Locational (*bakery*). A workable theory of morphology in any viable model of grammar must not merely account for all these operations, categories, and objects, but also demonstrate how they interact and interrelate.

The fundamental questions of morphology which emerge from the ancient and current research on the structure of words, then, seem to be the following:

1. What are the grammatical atoms, the basic elements of language:
 - a. the morpheme (lexical and grammatical)?
 - b. the lexeme and the grammatical morpheme?
2. How are phonological, grammatical, and semantic representations of the basic grammatical elements related at each of their respective levels:
 - a. directly (biuniquely)?
 - b. indirectly (conditionally and, if so, how)?
 - c. both?
3. How many morphologies are there:
 - a. inflectional and derivational (Split Morphology)?
 - b. only one (Integrated Morphology)?
4. What are the categories of morphology?
 - a. What is the outer limit on their number and what determines it?
 - b. What is the nature of these categories?
 - (1) grammatical or semantic?
 - (2) How are derivational and inflectional categories related?

5. What are morphological rules:
 - a. special morphological operations (WP morphology)?
 - b. lexical insertion + allomorphy (Lexical Morphology)?
 - c. the operations of syntax (Word Syntax)?
6. Finally, what adjustments to syntactic theory are required to accommodate a theory of morphology?

This book will develop a model of lexicology and morphology focused specifically on these issues.

1.4 BASIC PRINCIPLES

In order to develop answers to the questions catalogued in the previous section, we need a base of central truths to draw upon during our investigations that will serve as anchors and a point of departure for the argumentation. Over the history of linguistics few principles have become so axiomatic as to provide such a base; however, the first two principles below seem to me to be axiomatic. They are followed by three theoretical principles of modern linguistics and cognitive science which seem firmly established even though troubled by lingering questions of detail.

I. *The uncontroversial prototypical major class lexical items (nouns, verbs, and adjectives) consist of nonnull, mutually implied (directly articulated) phonological, grammatical, and semantic representations.*

This principle is a specification of the Stoic (and subsequently Saussurian) definition of the classical linguistic sign. Throughout this book, noun, verb, and adjective stems will be referred to as “prototypical major lexical class items”. “Prototype” is used in this context to distinguish these uncontroversial lexical items from other potential types of lexical items, which some morphologists argue must belong to an independent morphological component. That Principle I holds for these three classes of lexical items has been assumed for centuries and is, to my knowledge, uncontroversial. The exact status of adverbs, however, is controversial. Manner adverbs seem to derive rather freely from qualitative adjectives while spatio-temporal adverbs do not seem to do so. It is widely recognized that items referred to as adverbs in the past in fact are several marginally connected classes. This category will be examined in what follows and most of the items composing it will be included under Principle I. All types of bound and free grammatical morphemes are considered controversial and are included among the data investigated here. The central issue of chapter 2 will be whether grammatical morphemes are covered by this principle. Whether the phonological representation may be null is an issue which still emerges from time to time, so it will also be examined in chapter 2.

II. *Prototypical major class lexical items constitute synchronically open classes.*

The lexical stock of the prototypical major lexical classes may be expanded synchronically by lexical derivation and a wide variety of logical, nongrammatical means described as LEXICAL STOCK EXPANSION by Beard (1987b): borrowing, loan translation, onomatopoeia, blending, backformation, clipping, acronymization, and the like. Whether the lexicon also contains some closed classes is an issue at stake in the remainder of this book. The point of Principle II is that the closed status of classes like prepositions and auxiliaries may not be ignored, which brings into question their assignment to the lexicon. In order to mix the two types of classes, one must first prove that nothing of significance motivates the distinction, that is, the differences between grammatical relations and semantic classes.

III. *Prototypical major class items belong to one and only one lexical class (category).*

Principle III means that each uncontroversial major class item belongs to a single, discrete lexical class. A major class item may be a noun, verb, or adjective but not both a noun and verb. Items like *love*, therefore, which have both a verbal and a nominal sense, are either accidental homonyms, or one is a principled derivate of the other. The assumption here is that the lexical categories are distinct and mutually exclusive, overlapping nowhere, but that they are related to each other by rules whose nature is an empirical question. Notice that this principle does not speak to the issue of SQUISHES (Ross 1972), that is, MIXED CATEGORIES (Lefebvre and Muysken 1988). The category to which a major class item belongs may in fact be a mixed category, which derives its properties from two other, pure categories. However, if a major item belongs to a mixed or pure category, it belongs to that one category alone unless it is shifted to another by derivation. The reason that this principle is desirable, aside from the rigor it imparts to the model, is that it motivates derivation rules. Without Principle III there is no explanation of why languages have derivation rules, especially transposition (chapter 8), whose unique purpose is to convert members of one class to another.

IV. *The operations of an autonomous module have no access to operations internal to any other module.*

This is the principle of modularity as presented by Chomsky (1981) and Fodor (1983). If we assume that objects and operations of various grammatical subcomponents are distinct, we assume that they interact in only one way: the output of one set may be the input of another set. The operations of one distinct module or component cannot interact in any way with those of another. Hence, if the evidence shows the conditions on morphological rules to be compatible with those of syntax, the two grammatical components cannot be independent. However, if the conditions on

their operations are incompatible, we must conclude that the two constitute discrete components, either one of which may operate only on the input or output of the other.

An important implication of Principle IV is that the outputs of various modules will reflect the nature of that module. In terms of the lexicon and syntax, this means that should the lexicon and syntax contain similar categories or operations, lexical output will nonetheless differ from syntactic output over the same categories and operations. Moreover, the differences will reflect the different natures of the modules involved: lexical output will always be words, while syntactic output will always be phrases, whatever similarities the two modules might otherwise share.

V. The parameters of morphology are universal.

This is the principle of Universal Grammar (UG), revised by Chomsky (1981) to make clear the claim that the components of grammars of various languages are not necessarily identical but simply share a universal set of parameters. These parameters exhibit a limited range of settings which may vary from language to language. Assuming this claim as axiomatic commits the remainder of this book to a search for a set of categories and operations available to all languages. The possibility that the grammatical categories of English represent a different set of parameters from those of, say, Mohawk, will not be entertained, even though it is an equally reasonable a priori assumption. Principle V is thus little more than a stipulation at this point, an attempt to restrict the enormous range of theoretical possibilities to an addressable set.

1.5 CONCLUSION

This book is a work of lexicology and morphology at the edge of syntax rather than at the edge of phonology. Because work on allomorphy since the Generative Revolution has been conducted at the expense of methodical examination of morphological categories, we have a much clearer picture of the interface of morphology and phonology than we have of the lexicon-morphology and syntax-morphology interfaces. For this reason, the present work will concentrate on categories and the abstract operations of derivation rather than on allomorphy. Within these areas, this book will recommend some rather bold changes in syntactic and lexical theories. The benefit of taking these radical demands seriously is a more complete, more integrated overall theory of language.

NOTES

1. This theoretical consistency demonstrates that the ancients were just as capable of becoming prisoners of their theoretical models as are we.

Apparently Varro, in his fervor to maintain mathematic symmetry, ignored the fact that participles represent an entirely derived class while the other three are fundamentally lexical.

2. Compare this definition with Bloomfield (1933: 274): “The lexicon is really an appendix of grammar, a list of basic irregularities.”

3. The fact that *man-driver* may be interpreted as “a man who drives” is usually explained in terms of a second compound type, that is, [*man*] [*driver*] versus [*truck driv*]er.