The Morpheme: Its Nature and Use

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It is somewhat surprising that many surveys of the field of morphology — even quite comprehensive ones, like Spencer & Zwicky 1997 — devote scant attention to the nature of the morpheme, its ontological and epistemological status. They assume with remarkably little discussion that we know what morphemes are, and where and how to find them, and that the core problems of the field lie elsewhere. My intention here is to suggest that this optimism is misplaced.

Jones's (1962) monograph from which the present chapter draws its title makes an essential point about core theoretical notions in linguistics. An understanding of a term like "phoneme" (in Jones's book) must be grounded in more than just what linguists have written about its definition and place in the ontology of linguistic theory: we must also go to the literature and examine what they *do* with their phonemes, how the concept is actually used. This is at least as true for the 'morpheme', and it is necessary to explore both what people say morphemes are and how they in fact deploy them.

I begin with some history, tracing the origins of the term and its development in theorizing through the structuralist period. Some basic problems with the classical conception are pointed out, problems which were quite familiar (but not substantively resolved) in the structuralist literature. Although this chapter appears in a handbook of *inflection,* I draw my illustrations both from inflectional and from derivational morphology. This seems reasonable, since general discussions of the morpheme have treated it as a concept equally applicable across this distinction. No issue would arise here, of course, for those linguists who deny the existence of a principled distinction between derivation and inflection, and no current proposal for ways to differentiate the two would appear to have the consequence that some of the formal situations to be discussed below in section 1.4 are predicted to arise in the one domain but not the other.

I then consider the role of morphemes in early generative grammar, a context in which discussion of morphology *per se* was marginalized and its traditional domain subjected to a sort of "Partition of Poland" between syntacticians and phonologists. The subsequent re-emergence of interest in morphology as a distinct field soon led to a divergence of theoretical views, much of which can be put down to differences of opinion about the nature and status of morphemes. Close examination of the practice of morphologists, however, suggests that the actual theoretical cleavages in this regard are not always as they might seem.

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1 Some Background

In linguistics, morphology is the study of words, and since the morpheme is at the core of morphology, we begin with the basic notion of a word. Although notoriously subject to differences of sense when seen from different perspectives, a word is fundamentally the unit of mutual association among several sorts of properties. Thus, the word *cat* in English has phonological properties (/kæt/), semantic properties ('*Felis catus*, a small furry domesticated carnivorous mammal that is valued by humans for its companionship and for its ability to hunt vermin and household pests') and syntactic properties (Noun, [+Common, +Count]). The connections among these are irreducible: that is, it is not possible, say, to associate the vowel /æ/ by itself with the 'cute, furry' part, or the final /t/ with its status as a common (not proper) Noun.

1.1 Origins: Signs, Basic and Otherwise

As such, *cat* nicely fits de Saussure's (1916 [1974]) notion of a minimal linguistic sign (even though Saussure did not include syntactic content in his account of individual signs). But Saussure realized that not all words are minimal signs. Even ignoring the problems presented by phonological words that include clitics together with their hosts (for which, see Anderson 2005), a word like *unavoidable* has a rather different character from that of *cat*. The phonology here is something like /ˌʌnəˈvoidəbl̩/; the semantics more or less 'not possible to avoid' and the whole thing an Adjective. In this case, parts of the phonology *are* connected to parts of the meaning, so the initial /ʌn/ represents the 'not' part, the final /əbl̩/ the 'possible to' part, and /əvoid/ the 'avoid' part.

Such a word Saussure called a *partially* or *relatively motivated* sign. We might regard its parts as minimal signs in themselves, and of course these are the objects we teach our students to identify as *morphemes* in Linguistics 1. Considering the facility with which they can carry out that exercise after being given only a few examples, the notion seems to have a good deal of intuitive content. We could thus say that a first approximation to the notion of the morpheme is "a word or part of a word which constitutes an irreducible, minimal sign."

Saussure himself does not use the word *morpheme* (or its French equivalent, *morphème*) to refer to constituent parts of a relatively motivated sign, although the term had been introduced as early as 1880 (as Russian *morfema,* later German *Morphem*) by Jan Baudouin de Courtenay, who defined it as "that part of a word which is endowed with psychological autonomy and is for the very same reason not further divisible. It consequently subsumes such concepts as the *root* (*radix*), all possible *affixes,* (*suffixes, prefixes*), *endings* which are exponents of syntactic relationships, and the like" (Baudouin de Courtenay 1895 [1972]: 153; Stankiewicz's translation).

By the time of the lectures that form the basis of Saussure's *Cours de linguistique générale,* he was quite familiar with Baudouin's work, which he praised on various occasions. It is therefore noteworthy that he did not adopt — or at least mention — Baudouin's designation for meaningful parts of a word. The potential significance of his failure to adopt this (or any other) distinctive terminology for such units is notable, in light of Wells's (1947: 8) observation that "the term *morphème* was current in Saussure's day, but with a specialized significance: the 'formative' elements of a word (affixes, endings, etc.) as opposed to the root."

The usage Wells is referring to here was presumably that of Antoine Meillet, his students and colleagues. In his French translation of Karl Brugmann's 1904 *Kurze vergleichende Grammatik der indogermanischen Sprachen*, Meillet rendered Brugmann's term *Formans* (Brugmann 1908), with the sense indicated by Wells, as *morphème,* and remarked in a letter to Baudouin de Courtenay that he had borrowed Baudouin's "joli mot," as he called it, for this purpose.[1] In Meillet's work, a

[1] See Mugdan 1986 for further discussion of this and other uses of "morpheme" and its cognates in other languages

language's *morphologie* generally refers to its patterns of inflectional (and derivational) marking, and he uses *morphème* in various works to designate the formal reflections of morphological categories. For example, Meillet & Vendryès (1924: 148) say that "the principle of formation of Indo-European words is affixation: that is, to the element expressing the concept of an idea or an object (semanteme) are added the various elements (morphemes) marking the categories of words or their grammatical relations" (my translation).

Baudouin's 1895 definition clearly intended a more general understanding of the notion of the morpheme, and this is the way it has been interpreted subsequently. Baudouin was a great coiner of neologisms, and his innovated word for the smallest indivisible component of a word was clearly based on the word 'phoneme', already in use for a minimal element in the analysis of sound.[2] Saussure, on the other hand, maintained a view of the sign relation on which it holds between whole words[3] and their meanings, and so had less need for a way to refer to such a unit within words (contrary to what is usually suggested, as argued in Anderson 1985 and Carstairs-McCarthy 2005). Saussure would presumably have been familiar with Meillet's usage, as well as Baudouin's, and his failure to designate any sort of meaningful sub-parts of words with such a special term can plausibly be seen to be a consequence of his general failure to recognize such components as important linguistic objects in their own right.

It is possible to see in the difference between Saussure's and Baudouin de Courtenay's usages the beginnings of a basic division in attitudes toward morphological structure that characterizes the field today. For Saussure, the 'relative motivation' of a sign like French *poirier* 'pear tree' resides in its relation to *poire* 'pear', a regular relation in form that is correlated with a regular relation in meaning. This is quite different from the description of *poirier* as composed of two pieces (morphemes), *poire* and *-ier*. *Baked* differs in form from *bake,* and the difference carries the significance 'past tense'; but this is no different from the relation *ran* bears to *run*, which supports the same sense. The meaning of 'past tense' is linked to these (and other) ways of differentiating the related words, and not with a separable piece of one of the forms. Arguably, Saussure's relational notion of morphological composition does not require a special term to designate the pieces of a partially motivated sign, and thus was the first version of what we can think of as a 'rule-based' conception of word structure as opposed to Baudouin de Courtenay's 'morpheme-based' analysis.

1.2 The American Structuralist Morpheme[4]

A useful starting point for the discussion of notions of the morpheme in structuralist theory is the discussion in Bloomfield's (1933) classic book. This is partly because Bloomfield's notion of the morpheme served as the jumping-off point for later theorizing, but the book is also instructive for its occasional divergences between theory and practice. Presenting his views in the context of a thoroughly behaviorist set of rigorous procedures for discovering the elements of a linguistic analysis, Bloomfield often took his morphemes where he found them without requiring them to

by linguists from Baudouin to the present day.

[2]It is worth noting that the word *phoneme* as used at that time had none of the connection with distinctiveness that it acquired in later structuralist usage. As a term for an element of a universal or language-specific sound inventory, *phonème* was first employed by Antoni Dufriche-Desgenettes in the 1860s (see Mugdan 2011). Similar to the usage of others of the time with respect to "sounds," Dufriche's sense of the *phonème* involved a degree of abstractness beyond that of the physical speech sound, but not involving a criterion of distinctiveness. Saussure's own use of the word referred to a historical entity and was rather idiosyncratic, but these matters need not concern us here. See Anderson 1985 for some discussion.

[3]The 'word' is probably not the right unit to employ here, in any of its (diverse) standard senses, since much the same must be said about multi-word expressions whose meaning is not compositional. I ignore that complication here.

[4]The account in this section largely follows that of Anderson 1992: ch. 3.

have emerged from the mandated procedures when those procedures failed to yield the desired answer.

Bloomfield (1933: 161) defines a morpheme as "a linguistic form which bears no partial phonetic-semantic resemblance to any other form" i.e. a form that contains no sub-part that is both phonetically and semantically identical with a part of some other form. Unpacking this slightly in the commoner formulation as "a minimal same of form and meaning," it is the requirement that phonetic and semantic resemblances be correlated, and it yields as 'morphemes' the elements that result when further division would destroy that correlation.

Taken literally, this definition leads to a variety of problems. One of these concerns the presence in a great many languages of "phonaesthemes": sound-symbolic material such as the initial *sl-* of several English words referring to frictionless movement (*slip, slide, slither,* etc.); the initial *gl-* of words like *glow, gleam, glitter, glimmer, glare,* etc. referring to light emitted from a fixed source, or *fl-* in words like *flash, flare, flicker* referring to transitory light sources. Bloomfield (1933: pp. 244ff) enumerates a number of these (without really addressing the issue they pose for his definition of the morpheme), and they have been discussed often (if inconclusively) in the subsequent literature. What is at stake in these partial resemblances is a similarity in (reasonably) concrete semantics, and so it is unlikely that exactly parallel phenomena exist in the domain of purely grammatical inflectional morphology, but their bearing on the general notion of the morpheme remains.

Bergen (2004) shows that these meaningful sub-parts of words are quite real for speakers, but linguists have not really known what to do with them. There is general agreement that they are not to be identified as morphemes, but the basis for excluding them is quite unclear. They have distinctive (if sometimes rather vague) semantics, correlated with distinctive phonological shape. It is not possible to write them off on the basis that the residue once they are subtracted is typically not a recurrent element itself — why is the decomposition of *glimmer* as *gl+immer* (cf. also *shimmer=sh+immer*, from a set also including *shine*) fundamentally more problematic than that of *huckleberry* as *huckle+berry*? Linguists are of one voice, however that there must be a principled difference. Bloomfield calls these resemblances *root-forming morphemes,* thus treating them as a sort of morpheme, but others have generally wanted to find some analysis that does not have that consequence.

Another difficulty is more technical, and served as the basis of subsequent elaboration. Bloomfield's definition seems to assume that morphemes have a determinate phonological content, and as such is closer to the later usage of the term *morph* or *allomorph*. Later papers (e.g. Harris 1942, Bloch 1947, Hockett 1947, Nida 1948) refined the notion along the lines of the developing structuralist understanding of the phoneme. Just as phonemes came to be seen as abstract elements realized by members of a set of phonetic segments (their allophones), so morphemes were interpreted as abstract structural elements realized by members of a set of concrete phonological forms (allomorphs). Bloomfield's actual practice is quite in line with this — he treats *duke* and *duchess* as sharing a morpheme with two *alternants*, even though it is hard to derive this analysis from his definition.

The resulting view involves a commitment to several basic principles:

(1) a. Morphemes are homogeneous, indivisible atomic units of linguistic form linking some component(s) of meaning with a set of mutually exclusive allomorphs that express it.

b. Each morpheme has a determinate semantic content, and each allomorph has a determinate phonological form.

c. Words are composed exhaustively of morphemes.

d. Each morpheme in a word is represented by one and only one allomorph; and each allomorph represents one and only one morpheme.

It was essentially in this form that American structuralists presented their generative successors with the notion of the morpheme, and with it, the field of morphology. Within morphology, this definition implies a clear division of labor, again modeled on practice in phonology. *Allomorphy* is the analysis of the paradigmatic conditions determining the range of possible variants of a single morpheme and the conditions under which each appears. The remainder of the study of morphology falls under *morphotactics*, parallel to phonotactics in being the analysis of the principles governing the syntagmatic distribution of morphemes in relation to one another.

1.3 European Structuralism

My focus here is on theories of the morpheme in American structuralism, because the view that emerged there was the one inherited by later generative approaches to grammar. The linguists who were most influential in developing that picture came primarily from the anthropological tradition, with a focus on field work procedures as the primary path to the study of language, and as a result, their idea of how to define terms like "morpheme" was to specify a set of mechanically applicable procedures that would lead to the discovery of such elements. It is plausible to argue that they thereby fell victim to Bazell's (1952) "correspondence fallacy," one form of which is the assumption that a mechanical procedure identifying some objects that correspond to an intuitive, pre-systematic type will necessarily provide an adequate definition that completely reconstructs the traditional understanding of that type.

In the first half of the twentieth century, when the American notion of the morpheme was being elaborated, the major linguists in Europe came from rather different backgrounds in philosophy or the philological study of various languages. For them, procedural approaches to basic theoretical constructs were less important than more traditional forms of definition that emphasized the direct cashing out of pre-systematic intuitions. In practice, the differences were somewhat limited: proceeding from their understanding of the morpheme as a minimal Saussurean sign, they arrived at much the same units in looking for the "morphemes" of a language as their procedurally oriented colleagues across the Atlantic.

Some differences in the extension of the term 'morpheme' did emerge. Martinet (1960), for example, distinguished *morphèmes* as units of grammatical meaning from *lexèmes*, units of lexical meaning, continuing the usage of Meillet described above in section 1.1. Morphèmes and lexèmes together constituted for Martinet the class of *monèmes*; but while there was a difference in the kind of meaning conveyed by the two types of monème, both were units of association between components of phonological form and components of meaning.

Hjelmslev (1943) limits the use of *morpheme* to a unit of content (not form) corresponding only to inflectional categories, and not other meaningful elements (though it is quite difficult to place Hjelmslev's views on this, as on many other basic notions, in relation to those of other scholars). The restricted uses of the term by Martinet, Hjelmslev and their colleagues, however, did not represent in themselves important differences between European and American understandings of the structure of complex words.

The Swedish linguist Adolf Noreen (1854-1925) also used the word morpheme (or rather, its Swedish counterpart *morfem*) in a somewhat idiosyncratic way. For Noreen, a morpheme was an expression with a unitary associated meaning, defined recursively so that affixes, words, and phrases all count as morphemes: *dog, -s, dogs, big dogs,* etc. are all morphemes on this view, which goes together with a usage of *phoneme* that allows it to apply to arbitrarily long segments of phonetic form, rather than to an individual segment. He was followed in this usage of 'morpheme' by a few linguists in Scandinavia (including Valentin Kiparsky, father of Paul Kiparsky), but the notion did not catch on elsewhere.

A difference in practice between Europe and America concerned the role of meaning. As American structuralism solidified around an essentially behaviorist conception of language, meaning tended to be marginalized or disregarded altogether. Morphemes were supposed to have not only a form but an associated meaning, but a common assumption was that meanings were intrinsically unavailable for study in themselves, and so American linguists tended to be content with the observation that the difference between one morpheme and another corresponded to some difference in meaning without feeling a need to say much about what the actual meanings involved might be.

European linguists of the period were much more interested in descriptive semantics, and this had consequences for their work in morphology. Roman Jakobson, in particular, took the principle that a morpheme has a meaning to the conclusion that this meaning ought to be unitary, even in cases where some apparent diversity appeared to be present. Jakobson's (1936) study of the category of Case accordingly attempted to propose a unitary common meaning ("Gesamtbedeutung") for each of the formally distinct nominal cases of Russian, with results that have been debated ever since. This line of research produced a variety of studies in response, but since the work has formed a part of the research tradition more in semantics than in morphology, it will not be pursued further here. The related industry within morphological analysis of decomposing morphosyntactic features into component values also does not bear directly on our concerns here.

1.4 Termites in the Foundations of the Structuralist Morpheme

The picture structuralist morphology led to is one on which morphemes (construed as sets of allomorphs) have on the one hand a meaning and on the other hand an instantiation in a particular phonological alternant. The principles in (1), then describe the (ideal) relation of meaningful morphemes to the allomorphs composing the phonological representation of the word form. This idealization is rather at odds with the empirical facts, however, and in this section I survey some of the ways in which it is inaccurate. Most of these were recognized already byHockett (1947); somewhat unaccountably (to a later reader), Hockett seemed to feel that giving each of the problematic cases a name sufficed to resolve the difficulties they appear to pose for the theory of the morpheme.

The phenomena of **circumfixation** (e.g. Indonesian *ke*bebis*an* 'freedom' cf. *bebis* 'free'; *ke*datang*an* 'arrival', cf. *datang* 'come': Sneddon 1996: 35ff.) and **infixation** (e.g. Sundanese *ɲ*ar*aian* 'to wet (pl.)', sg. *ɲaian*: Robins 1959; or Koasati *hocíf*n 'smell-2SG', cf. *hófn* 'smell-3SG': Kimball 1991) demonstrate that the phonological expression of a morpheme is not necessarily continuous and indivisible, since (part of) the expression of some other morpheme may interrupt it. Some authors (e.g., Corbin 1987) have attempted to argue that genuine circumfixes do not in fact exist, and that apparent instances can always be decomposed into the combination of an existing prefix and suffix. These arguments are not convincing, however, for languages of the Indonesian type (where the meaning and distribution of a circumfix may be unrelated to properties of any prefix and/or suffix); and in any event, the formal problem is the same for infixation (where the stem into which the infix is inserted becomes in effect a circumfix). Some generalization of the phonological form of allomorphs, perhaps along the lines suggested by McCarthy (1981) is thereby indicated, and such an extension does not appear to compromise the essential content of the traditional notion of the morpheme in fundamental ways.

Closely related is the problem of **multiple exponence**: systems in which the same category is marked in multiple places within the form. An example is provided by negation in Muskogean languages such as Choctaw (Broadwell 2006: 148ff.). In this language the affirmative form *iyalittook* 'I went' corresponds to the negative *akiiyokiittook* 'I didn't go'. There are several separate aspects of this latter form that mark negation: a. one set of subject markers is replaced by another (*-li* is replaced by *a-*); b. *k-* is prefixed to the stem; c. *-o(k)* is suffixed; d. the stem vowel carries an

accentual feature of length; and e. the optional suffix *-kii* has been added. Such multiplication of markers is similar to the circumfix case, but some of the morphemes involved may be linked to other things as well (and may have independent motivation).

Verbal agreement in many languages involves multiple marking of the same content. A simple example (for which see e.g. Aronson 1982) is the Georgian verb *mo<u>v</u>di<u>v</u>ar* 'I come', where both underlined *v*'s indicate first person subject (cf. *modixar* 'you come'). Another example is provided by class marker (gender) agreement in Batsbi[5] (Harris 2009), a Northeast Caucasian language as illustrated in (2).

(2) tiši^{n} c'a daħ d-ox-d-o-d-an-iš
old house PV CM-destroy-CM-TR.PRES-CM-EVIDI-2PL.ERG
You (PL) are evidently tearing down the old house

The verb here contains three separate instances of the marker *d*, all triggered by agreement with the noun class or gender of the object *c'a* 'house'.

Particularly exuberant expression of the same verbal argument in multiple places in the form is characteristic of the Kiranti languages of Nepal, such as Limbu (van Driem 1997). The histories of these languages appear to involve multiple repetitions of the coalescence of an inflected auxiliary with a preceding (independently inflected) main verb, leading to synchronic states of affairs in which two, three, or even more markers refer to the same argument: e.g., Limbu *dza<u>ŋ</u>pət<u>ə</u>* 'I'm going to eat', where both *ŋ* and the final schwa are markers of first person subject agreement. The Papuan language Skou (Donohue 2003) provides another instance in which multiple markers correspond to a single verbal argument, and where the history that has led to this situation can be reasonably established. Such examples demonstrate not only that multiple exponence is possible in agreement systems, but also that historical change is not constrained by a requirement that it not result in systems with this property.

The problems posed by various forms of discontinuous expression of the same content material for the principles in (1) would seem to be largely mechanical, but some authors (e.g. Halle & Marantz 1993, Steele 1995) have asserted, on the basis of a commitment to strictly discrete and local expression of morphosyntactic properties along the lines of (1), that multiple exponence can never occur in the morphological system of a natural language. As discussed in Anderson 2001, such a theoretical position must be rejected or modified in light of the many clear cases of this phenomenon in the languages of the world.

There are other, more fundamental difficulties. Consider first the existence of **empty morphs**, morphological material that does not correspond to any part of the meaning of the form in which it appears. Romance theme vowels, which occur with some combinations of inflectional material and not with others but do not by themselves signal any specific category, are a standard example. See Aronoff (1994: 45–53) for some discussion of this case.

In several Algonquian languages, inflectional person marking prefixes such as Cree *ki-* '1st person', *ni-* '2nd person' and *o-* '3rd person' are followed by an empty element *-t-* when added to a vowel-initial noun or verb (Wolfart 1973; cf. *ospwākan* 'pipe', *o<u>t</u>ōspwākan* 'his pipe'; *astāw* '(he) puts (it)', *ni<u>t</u>astān* 'I put it'). This element is the product of historical rule inversion: in earlier stages of Algonquian, stem-initial /t/ was deleted except when 'protected' by a personal prefix. This led to t/∅ alternations which were later resolved by treating all of the relevant stems as vowel initial, and introducing a /t/ precisely when such a stem (including both original *t*-stems and those originally beginning with a vowel) is preceded by a personal prefix. Since other instances of vowel hiatus are

[5]Also known in the literature as Tsova Tush.

resolved in other ways, the occurrence of this *-t-* is morphological in nature, although the element itself has no independent content.

Derivational examples include the underlined material in English *crime*/*criminal*, *page*/*paginate*; *sense*/*sensuous*, *habit*/*habitual*/*habituate*, Spanish *madre*/*madrecita* (cf. *co-madre*/*co-madrita*) or Russian: *slog* 'syllable', *slogovoj* 'syllabic' (cf. *odno-složnyj* 'monosyllabic'). Similar formations are found in vast numbers of languages, and compromise the notion that morphemes always have semantic content (or else that words are always exhaustively analyzable into morphemes).

A distinct but related problem is posed by **superfluous morphs**. These are elements that can be shown to have content in some of their occurrences, but where that content is inappropriate in others. A widely cited example of this situation is the distinctively feminine stem shape that appears in Romance adverbs like French *doucement* 'sweetly, gently'. Feminine agreement is quite unmotivated in French adverbs, and appears only as the historical reflex of their origin in a construction with an adjective modifying the feminine noun *mēns* (ablative *mente*).

This is by no means an isolated example: consider, for example, the *th* and vowel change in English *lengthen, strengthen*, or the *t* in *heighten*. Note that e.g. *lengthen* means 'to make *long*' and so we should expect **longen, *strongen* (like *shorten, weaken*) and perhaps **highen*. The formation of *strengthen, lengthen, heighten* on the basis of *strength, length, height* rather than the semantically more appropriate *strong, long, high* is motivated not by its apparent morphological composition but rather by a phonological condition discussed by Siegel (1974), to the effect that causatives and inchoatives in *-en* can only be formed from bases ending in an obstruent. In the observed forms, we must say either that the additional 'morpheme' has no meaning, or else that this meaning is somehow disconnected from the meaning of the whole word.

The complementary problem is presented by **zero morphs**, instances where some aspect of a form's content is not reflected at all in its form. The poster child of such formation is the Russian genitive plural of nouns like *dáma* 'lady', GPL *dam*. Treating such cases by positing a morpheme with no phonological content, but only a meaning, is a time-honored form of analysis, but that does not mean it is really consistent with the classical understanding of the morpheme. Jakobson's (1939) eloquent defense of such zeros as the way to analyze cases like that of the Russian genitive plural certainly demonstrates that forms with no overt marker can be opposed to other forms within the same paradigm just as affixed or otherwise marked forms can. That does not, however, show that the appropriate way to do that is to posit a "minimal same of form and meaning" with no overt form. Describing this situation by appeal to a "zero morph" does not provide a solution to the problem, but only a name for it. It seems simply to be a fact that many words have morphological properties that are not reflected in any way in their surface shape.

The presumed separability of morphemes is compromised by the existence of **overlapping morphs**. In Breton, for example (cf. Press 1986), *e dad* 'his father' contrasts with *e zad* 'her father' (cf. *tad* 'father'). Here the possessor is marked by the preceding *e* and the particular mutation of the initial consonant that is associated with it. As a result, the initial segment of the noun is simultaneously part of the exponent of the possessor and that of the stem. The limiting case of this is what Hockett (1947) called **portmanteau** morphs, like French *au=à le* where the two elements are coextensive and coincide completely in a single undecomposable form.

Similar are **cumulative** morphs, such as the suffix *-ō* of Latin *amō* 'I love' which realizes in a single segment the categories of person, number, tense, mood and voice that are parceled out among multiple components of other members of the paradigm such as *amābam* 'I loved, was loving'. Another clear example of such cumulation of categories in a single marker is the Finnish Nominative Plural ending *-t*, as in *talo*/*talot* 'house/houses' (compare Partitive *taloa*/*taloja*, where case and number are expressed separately).

The classical conception of the morpheme suggests that every word can be exhaustively decom-

posed, on the one hand into a sequence of meaning elements, and on the other into a sequence of phonological substrings, such that the relation between the constituent elements of the two sequences is one-to-one (and 'onto' in both directions, for the mathematically inclined). The facts just surveyed, among others, suggest that this does not correspond to the general case, and thus that words cannot be required to be analyzed as sequences of morphemes in this sense. Comparable sorts of problem with the ideal agglutinative picture are just what characterize 'inflectional' languages in the classical typology. When we incorporate the necessary emendations as codicils to the theory of the morpheme, the general picture becomes quite unconstrained as far as the relation between phonological and semantic form and thus loses much of its original appeal.

There is also another, quite different, set of problems for the classical picture of words as made up of morphemes. Because words are presumed to be partitioned into discrete, separable morphemes, the basic form of this theory holds that all of the phonological content relevant to signaling morphological content should be uniquely assignable to concrete segments. Sometimes, though, the aspect of a form's phonological shape that indicates some aspect of its content does not consist of segments (or parts of segments) at all. Trivially, this is true for "zero morphemes," since they have no phonological content, but more fundamental difficulties have long been recognized.

Quite widespread in many languages are various formations that can be subsumed under the general heading of **apophony**, including 'Umlaut', 'Ablaut', 'gradation', 'mutation', and other subcategories. Consider the relations among the forms of English strong verbs, such as *sing, sang, sung* (cf. also *song*), or (American English) *dive, dove*. Their analysis poses a classical problem that was discussed in great detail in a landmark paper by by Hockett (1954). When we ask what the correct analysis of e.g. *sang* is, several possibilities present themselves, none of them entirely satisfactory from the point of view of the traditional morpheme.

We might say that the past tense morpheme here has a zero allomorph, and that *sang* is a predictable allomorph of *sing* that appears before this past tense zero. This sort of analysis was deplored early on by Nida (1948): it involves saying that the thing we cannot see, the zero, is what signals that the verb is past tense, while the thing we can see, the vowel change, is analyzed as a mechanical concomitant of this. The result does not correspond to any plausible intuition about how form and content are related.

Alternatively, we might treat the vowel /æ/ as the past tense marker, but then we are forced to say that verbs like *sing*/*sang* have a Semitic-like consonantal stem (/s—ŋ/) and unlike others, a distinctive present tense marker /ɪ/. Apart from its basic implausibility, this account has trouble with verbs like *dive* that show (for many North American speakers) two alternative past forms, weak (*dived*) and strong (*dove*). The analysis in question has the consequence here that the two past tense variants are related to identical present tense forms that nonetheless represent totally different structures, or else that *dived* involves a superfluous 'present' marker /-aj-/ in addition to the past parker /-d/.

Another possibility is to say that the past tense marker in *sang* is a 'replacive' morph (/ɪ/→/æ/), not a piece of phonological content in itself but an operation on the content of the stem to change its vowel. It is quite difficult to see how the procedures of segmentation and classification appealed to in structuralist theories could ever discover an element of this sort. More importantly, perhaps, it is difficult to see how such an operation of replacement is consistent with the notion that a morpheme is an association of meaning and form, with some concrete piece of the phonological form signaling the corresponding meaning of past tense. Here what we really want to say is not that some aspect of the shape of *sang* indicates past in itself, but rather that past is indicated by the *relation* between *sing* and *sang*.

Examples abound in language where it is such a relationship between forms that indicates their respective morphological content, and not some discrete affix added to one or the other. Apart from

tense in strong verbs and a few nouns with residual Umlaut plurals (*mouse*/*mice*, *(wo)man*/*(wo)men*, etc.), English is not often thought to offer many instances. In fact, though, they are easy to find if one includes relations other than inflectional ones: consider pairs such as *sell*/*sale*, *blood*/*bleed*, *food*/*feed*, etc., where vowel differences serve morphological functions, and *believe*/*belief*, *prove*/*proof*, *speak*/*speech*, *bath*/*bathe*, *breath*/*breathe*, *glass*/*glaze* (provide with glass), *use* ([jus], noun)/*use* ([juz], verb), in which consonant changes operate in the same way.

Consonantal alternations marking inflectional categories are found in some languages. For example, Uralic languages often show a system of consonant gradation which in some instances (and originally) is phonologically conditioned by syllable structure: thus, in Finnish at the beginning of a short, closed syllable geminate stops become single, and single stops become (the reflexes of original) voiced segments. In the Saami languages, though, final nasals have been lost, and as a result there is no longer an overt suffix to mark the genitive (typically homophonous with the accusative). The gradation alternations originally associated with the addition of a final nasal in these cases remain, however, as the only marker in some paradigms. Thus, North Saami (Sammallahti 1998) has alternations such as *guolli* 'fish', GEN/ACC *guoli*; *giehta* 'hand', GEN/ACC *gieđa*, etc.

Fula (West Atlantic) has a system in which every stem potentially occurs in three distinct shapes that differ in the category of their initial consonant. These form three grades, a "continuant" grade, a "stop" grade and a "nasal" grade. Without going into the complex phonological details of this system (see Arnott 1970 and Anderson 1976 for discussion), the choice of one grade or another constitutes part of the agreement system both for nouns and adjectives and for verbs. Each of the more than two dozen noun classes of the language is associated with a specific grade, and "the stem-form appropriate to each class is as much a grammatical feature of the class as the concord-marking suffixes" (Arnott 1970: 93). Similarly, the choice of a nasal-grade form of the verb stem marks a plural or post-posed subject as opposed to a different grade appearing with a preposed singular subject.

Particularly difficult for the notion that morphological markers are always to be identified with some distinct substring within a word are cases where the marking instead is by **subtraction**. A class of nominals in Icelandic (e.g., *hamr* 'hammering' from *hamra* 'to hammer') have been widely cited in this regard. In these forms, we can show from the distribution of vowel length and other phonological properties that the noun is formed from the infinitive by deleting the final /–a/ that marks infinitives (see Orešnik & Pétursson 1977 for discussion).

In the structuralist literature, the most widely cited example of subtractive morphology was the supposed formation of masculine adjectives in French by deleting a final consonant from the feminine. This is almost certainly not the right analysis of this case, however; the feminine is instead formed from the masculine by adding a final schwa, preserving a final consonant that would otherwise be lost, as suggested by the orthography (and supported by other considerations: see Anderson 1982 and much other literature on the phonology and morphology of French). Although this example is probably not valid, other instances of subtractive morphology surely do exist.

In such cases, there is no requirement that the deleted material be a 'morpheme' in its own right. In the Icelandic nominals referred to above, the deleted *-a* is in fact the infinitive suffix, but since all infinitives (the bases for the formation) end in this element, it is not possible to distinguish the phonological and morphological characterizations of the deleted material (although the subtractive nature of the formation is clear from the presence of phonological properties that can only be accounted for on the basis of the presence of the final *-a* in the base from which it is built). In other cases, however, the deleted material clearly does not have any distinctive morphological value. In the Muskogean language Alabama, for instance, plural forms of verbs are made by deleting the rhyme (nucleus plus coda) of the final syllable of the stem: *balaa-ka* 'lie down (SG)'; *bal-ka* 'lie down (PL)'; *batat-li* '(I) hit once'; *bat-li* '(I) hit repeatedly'; *kolof-li* '(I) cut once'; *kol-li* '(I) cut repeatedly' (Broadwell 1993). In Huichol (Uto-Aztecan; cf. Elson & Pickett 1965: 48f.), perfective

verbs are formed from imperfectives by subtracting the final syllable, which is not itself a distinct marker of any category: *nepizeiya* 'I saw him (and may see him again)' *nepizei* 'id. (for the last time)'; *pïtiuneika* 'he danced (and may start again)', *pïtiunei* 'id. (and will not again)'. In all of these cases, a category is marked precisely by the *absence* of some phonological material we would otherwise expect, and not by the presence of some marker.

Another way to mark morphological categories formally (but without adding material to the form) is by **metathesis**. The best known proposed example of this is from the Salish language Klallam, where a sort of imperfective form of the verb is made by inverting the order of the stressed vowel and a preceding consonant: *čkʷú–t* 'shoot', *čúkʷ–t* 'shooting.' Comparable formations appear in a number of related languages of the family. In some instances, there is controversy about the correct analysis, but there is good reason to believe that in at least some of the languages involved, morphologically conditioned metathesis is definitely present (see Anderson 2004 for discussion and references). At least in Saanich, the incompletive category in question clearly involves a morphologically conditioned rule, and the relation between completive and incompletive is marked precisely by the relation between CCV and CVC.

Another apparent example of morphologically significant metathesis, from outside Salish, is suggested by (Mel'čuk 1997: 297): in the Kartvelian language Svan, transitive causative verbs are related to intransitives by means of a similar CCV↔CVC difference (cf. *li-deg* 'go out', *li-dge* 'put out'; *li-k'wes'* 'break, intr.', *li-k'ws'e* 'break, trans.') Such signaling of morphological content by means of the *re-arrangement* of existing material, rather than by the addition of a distinct marker, is especially difficult to reconcile with the traditional notion of the morpheme.

Similar difficulties are presented by marking based on **exchange relations** as in Diegueño (Yuman; Langdon 1970) *ɬʸap* 'burn (sg.)', *ɬʸa:p* 'burn (pl.)'; *sa:w* 'eat (sg.)', *saw* 'eat (pl.)'. Here the singular/plural relation is signaled by an interchange in the value of vowel length. Also problematic for the classical morpheme are relations based on **chain shifts**: e.g. Saami ("Lappish"), where as already noted above, the genitive is related to the nominative base in many nouns as geminate stop to simple voiceless stop, or simple voiceless stop to voiced (/pp/→/p/, /p/→/b/) and a variety of similar shifts. What is important in such examples is that the shifted value in some forms is identical with the unshifted values in others. As a consequence, there is no constant content to the formal expression of the category (here, genitive).

If we wish to maintain that words are exhaustively composed of morphemes, and that morphemes in their turn are discrete units representing the association of a part of the word's sound with a part of its sense, all of these types of morphological marking pose problems. From their examination, it becomes clear that not all components of a complex word's content are indicated by distinct affixes in the way this picture would suggest.

In fact, problems of this type are not limited to the domain of phonological expression. Consider: if every morpheme is an association between some form and some meaning, it ought to be the case that adding a morpheme involves adding some form, and as we have seen, that is not always the case. But it ought also to be the case that adding a morpheme entails adding some meaning, and that is not uniformly the case either. Again, there are zero cases: the empty morphs, where an added piece of form corresponds to no added meaning. There are also the superfluous morphs, where the morpheme has a meaning, but this meaning does not contribute to the sense of the form in which it appears.

More interestingly, there are also semantic analogs of subtractive morphs, where the addition of a formal 'morpheme' is actually correlated with the removal of some of the semantic content of the base form. Consider some pairs of Icelandic verbs distinguished by the presence of the ending *-st*, such as *gleðjast* 'rejoice', *gleðja* 'gladden (tr.)'; *kveljast* 'suffer', *kvelja* 'torture (tr.)'; *týnast* 'be, get lost', *týna* 'lose', and many others (see Anderson 1990, Ottósson 1992 for discussion). Here the *-st*

marker has the effect of detransitivizing the basic verb, removing from its meaning the components characterizing a causative relation between an agent and some state of affairs.

We could represent the semantics of the transitive bases here as something like (CAUSE x, (BECOME (P y))) (e.g., 'SBJ causes OBJ to become happy, to suffer, to be lost, etc.). The addition of the ending *-st* has the effect of removing the highest predicate (CAUSE x,y) from this structure (and also deleting the corresponding argument position and/or θ-role from the syntax). Phonological and morphological arguments show that *-st* is added to the base; syntactic and semantic ones show that the form with *-st* has less semantic content than the related transitive (i.e., what is involved is not simply something like the binding of the agent variable with an impersonal operator, or the like). The conclusion is that the addition of the *-st* 'morpheme' here has a subtractive effect on the meaning of the resulting form, parallel to the phonologically subtractive effect seen in other examples above.

Similar examples can be found in many languages, where intransitive verbs are morphologically more complex than corresponding causative transitives. This fact is typically concealed in analyses by glossing the additional marker as something like 'DETRANS' so that it appears to add something to the meaning, but when we ask what that something might be, it turns out that the effect of the marker is actually to eliminate some of the semantic content of the base. Semantically subtractive markers are just as problematic for the notion of words as uniformly composed of traditional morphemes as phonologically subtractive ones. As in the case of phonaesthemes, the fact that such examples rely on the lexical semantics of the items in question suggests that corresponding cases will not be found in the domain of inflection, but they nevertheless bear on the general tenability of the classical conception of the morpheme.

If we take seriously the evidentiary value of the morphological types surveyed in this section, it is evident that the most we can say in general about the analysis of words is approximately as in (3).

(3) A linguistic sign relates a word's content and its form. The content can be divided into its syntactic properties and its meaning; each of these can be further analyzed. The form can be analyzed into phonological segments (organized into syllables, feet, etc.). The relation between content and form may be partially systematic.

This is more or less equivalent to Saussure's original recognition of the existence of partially or relatively motivated signs, and offers no particular privileged status for a unit like the morpheme as traditionally construed. Nonetheless, linguists continue with disconcerting regularity to regard analyses such as the decomposition of *unavoidable* into *un+avoid+able* as if it provided a perfectly general model of word structure.

1.5 The Fate of the Morpheme in Post-Structuralist Grammar

Many of the difficulties noted in section 1.4 for the concept of morpheme were quite familiar to structuralists, and formed the basis for a somewhat contentious literature devoted to their resolution. Nonetheless, the basic idea that words were to be regarded as exhaustively composed of morphemes, where these were elementary units linking phonological form with meaning in a discrete and localizable fashion, was not really challenged. This was felt to be secure on the basis of the wide range of cases for which it provided a perfectly satisfactory basis for analysis. The difficult cases would have to be resolved somehow, perhaps by tinkering in various ways with definitions, but were not taken to pose fundamental difficulties for a notion that generally worked well in daily life. Of course, the view that the earth is flat is also consistent with a wide range of observations, provides a satisfactory basis for most of our projects, and generally works well in daily life.

The rise of generative theories of language in the 1950s and 1960s involved a rejection of many of the tenets of structuralism, but nonetheless built on structuralist notions in many other areas.

As a student of Zellig Harris, Chomsky inherited some of the conceptual apparatus of American structuralism, and as a student of Roman Jakobson, Halle brought the perspective of that particular version of European structuralism.

The innovative character of the new approach to language resided in its insights in the areas of syntax and phonology, and these were the domains that occupied scholars' interests. Morphology in itself was not something that generative theory was much concerned with. Besides, the concrete domain of morphology seemed vanishingly small. Recall that the nature of the classical morpheme suggests a division of morphological description between two subfields: allomorphy, and morphotactics. But once generative phonology had abandoned the notion of a phoneme based on surface contrast, and with it the distinction between phonemics and morphophonemics, it appeared that the vast majority of variation in the shape of morphological units would be subsumed under phonology, leaving nothing in this area for morphologists to do but list the unpredictable (suppletive) forms.

And from at least as early as Chomsky's (1957) analysis of 'Affix Hopping' in English it was assumed that the syntax could manipulate internal constituents of words, leaving little in the way of a distinctive 'morphotactics' as residue. This last move bears a mild irony, since in structuralist times it was assumed that syntax itself was nothing but the morphotactics of larger and larger domains: generativists and structuralists were thus agreed on the unity of syntax and morphotactics, though they differed on where the action was in describing this set of phenomena. In any event, from the generative point of view there did not seem to be much independent substance to the study of morphology. With only minimal interest as a focus of independent attention, the morpheme's appeal as a basic descriptive unit was not subjected to close examination, and so the structuralist conception was imported more or less unmodified into generative theories.

2 The Morpheme in Current Theories

Beginning with work in the 1970's, generative linguists gradually came to see that the abandonment of morphology as a distinguishable aspect of the structure of language was probably ill-advised. Regularities of variation in shape that are sensitive to morphological content appeared to follow principles that fell outside those of phonology, and the internal organization of words seemed to have quite different grounds from the organization of words into phrases and sentences. As the reductionist waters of the initial results of generative inquiry receded, a lost continent of morphology came back into view. The most natural assumption for most linguists was that this was a land populated primarily by morphemes of the traditional sort, and that interpretation has persisted at least in the rhetoric of adherents of several distinct theoretical positions.

2.1 The Rediscovery of Morphology

The retention of the structuralist ontology is clear in the papers that provided the early charter for the investigation of morphology within generative grammar. Halle (1973: 3f.) notes that "the assumption has been made quite generally that a grammar must include a list of morphemes as well as rules of word formation or morphology" and that "the list must include not only verbal, nominal, and adjectival roots but also affixes of various sorts." Halle's paper does not challenge the assumption that the items on this list are essentially associations between phonological and semantic content, though he does add, in accord with the much greater importance attributed to syntax at the time than in structuralist work, that "[i]t is all but self-evident that in the list of morphemes the different items [...] must be provided also with some grammatical information. For example, the entry for the English morpheme *write* must contain the information that it is a verbal root, that it

is a member of the "non-Latinate" portion of the list (it is by virtue of this fact that it is allowed by the rules of word formation to combine with certain affixes and not with others), that it is among the small class of verb stems that undergo the so-called "strong" conjugation, etc."

Halle's account of morphology in this paper is primarily a treatment of the ways in which the morphemes on this list can be combined into larger structures to make words. He does depart from previous assumptions in assuming that some of the information associated with words is linked to them as wholes, and not contributed directly by any of their constituent morphemes. This necessitates a list of the words of the language, its "dictionary," which is separate from the list of morphemes and serves as a filter on the output of word formation, sanctioning some combinations and disallowing others while adding word-specific information, such as the idiosyncratic sense of *recital* as referring to a concert by a soloist (and not simply an act of reciting), whether a particular word is or is not subject to certain phonological processes such as tri-syllabic shortening, whether the existence of a given word does or does not block other comparable formations, etc.

Halle's (1973) architecture for morphology seems to involve a non-trivial amount of duplication between the effects of rules of word formation and the content of the "dictionary," and was not widely pursued. His attention to words (and not simply morphemes) as the locus of significant properties was, however, taken up and expanded in another of the foundational works on morphology of the period, Aronoff 1976. The influential theory presented in that book was based on the notion that word formation rules, rather than simply organizing elements from a list of morphemes into larger structures, operated on entire words as basic elements, relating them to other words.

Aronoff's word-based morphology comes closer to being based on what I have described above in section 1.1 as Saussure's view of the sign, but does not in the process dispense with a reliance on morphemes. He does point out yet another class of problems for the traditional morpheme: prefix-stem combinations in English like *prefer*/*confer*/*presume*/*consume* etc., where there is apparently internal morphological structure but where neither the prefix nor the stem can be assigned a semantic interpretation on its own. Nonetheless, the words in a language's lexicon that serve as the inputs and outputs of word formation rules are assumed to be structured concatenations of rather traditional morphemes, once provision is made for such cases.

These morphemes are presumed to be identifiable by the rules of the morphology, and to be accessible in the structural descriptions and structural changes of those rules. For example, Aronoff invokes a set of rules of *truncation*, one of which serves to suppress the *-ate* of *navigate* in the formation of *navigable*. He proposes that such rules have a quite specific form: they always have the function of deleting a specified morpheme (here, /-At/) in the environment of members of a list of other morphemes (here including /-əbl̩/). The validity of this analysis[6] is not at stake here: what matters to the present account is the reliance it places on the conception of words as composed of rather traditional morphemes, even though the word formation rules themselves operate on words as wholes.

Other work in the ensuing development of a generative approach to morphology was quite explicitly based on classical morphemes as the basic structural unit. Selkirk (1982) for example treats the analysis of word structure as the extension of syntactic principles (such as "$\overline{\text{X}}$-theory") to word internal domains, where they would serve to organize morphemes in hierarchical structures entirely comparable to the syntactic organization of phrases. Another important paper of the time, Williams

[6]In fact, following the insightful observations of Corbin (1987) concerning truncation in French, Anderson (1992) proposes that what is truncated in such a case is precisely *not* (or only incidentally) a morpheme in the classical sense. On that account, truncation is a component of word formation processes (such as the one that forms adjectives in *-able* from verbs) that serves to accommodate material in words borrowed from another language that has morphological significance in that language, but where the morphology involved is opaque in the borrowing language. This issue is not directly relevant here, but it should be noted that the existence of truncation phenomena, on this account, does not furnish evidence for the significance of morphemes.

1981, is explicit in suggesting that morphological relatedness is to be reconstructed as the sharing of morphemes, where these are organized into structures that derive their overall properties through a notion of 'head' deriving from syntactic theory. Williams (1989) argues that these structures are grounded in the same notions of 'head' and 'projection' that operate in syntax, though the actual substantive parallels he cites seem rather inconsequential. Lieber (1980, 1992) pursues a very similar line, construing morphology as the "syntax of words" in a manner that recalls, with allowances for differences in the overall theoretical context, the structuralist account of syntax as essentially the "morphotactics of phrases."

All of this work is fundamentally based, explicitly or implicitly, on the assumption that words are to be seen as structured organizations of morphemes, where these basic elements are discrete units associating phonological, semantic and syntactic information in essential accord with the structuralist principles in (1). Problems with this notion of the sort discussed above in section 1.4 are not generally discussed. Where examples are considered in which morphological information is indicated by some aspect of a form other than a segmentable stem or affix, this is attributed to mechanical manipulation of the word's phonological shape by members of a vaguely specified class of "readjustment rules" or "morphologically conditioned phonological rules," whose operation is triggered by the presence of significant zero elements, perhaps in conjunction with 'grammatical' features of individual words or morphemes. Nida's (1948) objection noted above to the procrustean nature of such analyses is not generally addressed, or acknowledged.

2.2 Distributed Morphology and the Morpheme

Halle (1990) introduces a shift in the notion of the morpheme that serves as a bridge to later theories, in particular that of Distributed Morphology. In this paper, Halle assumes that morphemes are of two sorts, distinguished by their phonological nature. One type, *concrete* morphemes, are characterized by "a single fixed underlying phonological representation." These are to be distinguished from *abstract* morphemes, which "do not have a fixed phonological shape" and thus "lack a phonological U[nderlying] R[epresentation] in the vocabulary entries."

Both types of morpheme are represented in the terminal strings of syntactic representations, but differ in that while concrete morphemes have a phonological shape, abstract morphemes are simply bundles of features ([Plural], etc.). They are then provided with a phonological interpretation through a set of *spell-out* rules: for instance, the English morpheme [Plural] is spelled out as /∅/ following one set of nouns (*sheep, man, moose,* etc.); as /i/ after another set ending in /us/ (which is deleted in the plural), etc., and as /z/ by default elsewhere.

While the examples of abstract morphemes that he considers are inflectional in nature, Halle resists the suggestion that the distinction between concrete and abstract morphemes is equivalent to that between stem and derivation, on the one hand, and inflection on the other. This is because some inflectional elements (e.g., Spanish *-mos* '1PL verbal ending') have a constant shape. On the other hand, some variation in shape does occur in concrete morphemes (e.g. *man*/*men*), but in that case it is described by the operation of 'readjustment rules'.

Halle's distinction between concrete and abstract morphemes is problematic on various grounds, but what is significant about it is the proposal that at least some morphemes constitute the basic components of words from the point of view of the syntax, and are only supplied with phonological form at a late point in the derivation through the operation of the 'spell-out' process. This conception is extended to all morphemes (stems and affixes) in Halle & Marantz's (1993) presentation of the theory of Distributed Morphology. That theory implements the view that only the morphosyntactic properties of an element, and not its specific semantics or phonology, are relevant and visible to the syntax. "The terminal elements of the tree consist of complexes of grammatical

features. These terminal elements are supplied with phonological features only after Vocabulary insertion [...] Although nothing hinges on this terminology in what follows, we have chosen to call the terminal elements "morphemes" both before and after Vocabulary insertion, that is, both before and after they are supplied with phonological features." (Halle & Marantz 1993: 114).

Within this theory, the traditional analysis of morphemes is partitioned among several parts of the grammar. Allomorphy, or the variation in shape of morphemes, is separated into three components. Phonologically conditioned variation, such as the variation in the shape of the English regular plural among the forms [-s], [-z] and [-əz], is governed by the normal phonology of the language. Unpredictable, suppletive variation (e.g., the fact that the plural of *ox* is formed with the ending [-ən]) is described by context sensitive rules of Vocabulary insertion. Finally, some variation such as stem vowel Ablaut in English strong verbs (e.g. *sing*/*sang*/*sung*) is described by morphologically conditioned ("Readjustment") rules manipulating the phonological form introduced by Vocabulary insertion.

Morphotactics, in contrast, is said to be described by the syntax. Morphemes (in the abstract sense noted above) are distributed, both within and across words, by syntactic rule, and then phonologically realized by Vocabulary insertion. This picture would appear to predict that phonological units (introduced through Vocabulary insertion) would bear a straightforward, one-to-one relation to grammatical units arranged by the independently motivated rules of the syntax. If that were the case, we would expect the relation of form to content to be essentially the same as that envisioned by structuralist views based on morphemes conforming to the assumptions in (1).

This is not, however, the case, as a result of the presence of additional structure in the model. Halle & Marantz assume a level of representation ('M[orphological] S[tructure]') which intervenes between the output of the syntax and the process of Vocabulary insertion. A variety of operations can result in differences between the syntactically motivated structure and MS: these include insertion, deletion, or movement of morphemes; combination (of two types, 'Fusion' and 'Merger') of two or more morphemes into a single unit, or 'Fission' of one morpheme into two; and copying of features from one morpheme node to another.

Despite the claim (Halle & Marantz 1993: 121) that the manipulation of syntactic structure to produce MS occurs "only in highly constrained and fairly well understood ways," the result is that the two can in principle be arbitrarily different from one another. As a result, if we take the output of the syntax to correspond to the representation of content, and MS to the (schematic) representation of form, the relation imposed between the two is no narrower than the formulation in (3): partially systematic, but not discretely localized as required by (1). This does not in itself, of course, argue that the theory is incorrect or misguided, but it does show that it does not result in analytic units that correspond to the traditional notion of a morpheme.

The term 'morpheme' is used within this theory in two quite different senses: one for the abstract, phonologically uninterpreted objects that serve as terminal nodes in the syntax, a usage quite similar (apart from its apparent inclusion of root elements) to that of Hjelmslev (1943), and the other for the result of phonological interpretation of the elements of MS(a notion more commonly expressed by the term "formative"). Neither of these, however, articulates the same understanding as any of the more traditional uses of the word.

2.3 Morphology without Morphemes

If the rather loose connection between form and content expressed by (3) is an accurate characterization of the structure of language in general, the presumption of a tight link between the two domains that is implicit in the classical notion of the morpheme is misguided, and morphological analysis should proceed on some other basis. A useful classification due to Stump (2001) separates

contemporary morphological theories on the basis of differences that can be seen as hinging on their attitudes toward the traditional morpheme.

Lexical theories, on Stump's analysis, are those where associations between (morphosyntactic) content and (phonological) form are listed in a lexicon. Each such association is discrete and local with respect to the rest of the lexicon, and constitutes a morpheme of the classical sort. In contrast, *Inferential* theories treat "the associations between a word's morphosyntactic properties and its morphology" as "expressed by rules or formulas" (Stump 2001: 1). This allows the systematicities foreseen in (3) to be expressed, while not requiring the exhaustive one-to-one matching of form and content presumed by (1).

This distinction functions in combination with another to provide a substantive typology of theories. Orthogonal to the difference between lexical and inferential theories is that between *incremental* theories, on which a word bears a given content property exclusively as a concomitant of a specific formal realization; and *realizational* theories, on which the presence of a given element of content licenses a specific realization, but does not depend on it.

In these terms, the view which is most congenial to the traditional morpheme as the locus of form and content in close association is a lexical incremental one, like that of Lieber (1992). Distributed Morphology is characterized by Stump as lexical, in that it assumes a listed set of form-content associations, but realizational, in that the relation between overall content and overall form is looser than that presumed by a strictly morphemic analysis. Inferential-realizational theories include those of Matthews (1972), Zwicky (1985), Anderson (1992) and Stump (2001) himself. The fourth possibility, that of an inferential but incremental theory, is illustrated for Stump by the views of Steele (1995).

Inferential-realizational theories represent, in effect, the essential abandonment of the traditional concept of the morpheme. In such a picture, a grammar includes a lexicon of basic forms linking semantic and morphosyntactic content with phonological form: these correspond to the 'semèmes' of Meillet & Vendryès (1924) or Martinet's (1960) 'lexèmes'. The formal exponents of grammatical content, however, the 'morphèmes' of these writers, are not elements taken from a lexical list, but rather the consequence of the application of modifications in form induced as the effect of a system of rules or relational formulas.

3 Conclusion

Several fundamental distinctions in linguistic analysis are thus seen to be bound up in the usage by linguists of the basic term 'morpheme'. One of these corresponds to the basic nature of the sign relation as this was introduced into the study of language by de Saussure (1916 [1974]). Although virtually undiscussed in the literature over the past century, the question of whether this relation holds between the form and content of whole words on the one hand, or more locally of minimal internal constituents of words, is a basic one. If the interpretation offered above is correct, this differentiated the views of Saussure from those of Baudouin de Courtenay and many who came after them, and persists today in the difference between lexical and inferential-realizational theories. Across time, an overt indication of positions in this regard has been the attitude taken toward the role of the morpheme as represented by the role such a term plays in a theory's ontology.

A second, related difference can be traced back to that between Baudouin de Courtenay's (1895 [1972]) use of 'morpheme' to include roots as well as affixes, *vs.* that of Meillet or Martinet for whom the word referred only to the markers of grammatical information, and not to basic lexical elements. Today that distinction corresponds to the difference between lexical theories of morphology, which assume that the lexicon contains all such elements of either sort, and inferential theories, which treat grammatical information as marked by grammatical mechanisms distinct from the insertion

of lexical material.

The word 'morpheme' is one of the most basic terms in linguistics, one which students are expected to control almost from the beginning of their study of the field. Linguists of many persuasions use the word freely, if only as a descriptive convenience, even when their theoretical commitments are not consistent with the idealized picture of word structure inherited from our structuralist forebears. We commonly assume that both the intension and the extension of the term are virtually self-evident, but it turns out on closer examination to hold the keys to some of the deep questions we can ask about the nature of language. One of these, indeed, is whether or not there is any such thing as a 'morpheme'.

References

Anderson, Stephen R. 1976. On the description of consonant gradation in Fula. *Studies in African Linguistics* 7. 93–136.

Anderson, Stephen R. 1982. The analysis of French shwa, or how to get something for nothing. *Language* 58. 534–573.

Anderson, Stephen R. 1985. *Phonology in the twentieth century*. Chicago: University of Chicago Press.

Anderson, Stephen R. 1990. The grammar of Icelandic verbs in *–st*. In Joan Maling & Annie Zaenen (eds.), *Icelandic syntax*, vol. 24, Syntax & Semantics, 235–273. New York: Academic Press.

Anderson, Stephen R. 1992. *A–Morphous morphology*. Cambridge: Cambridge University Press.

Anderson, Stephen R. 2001. On some issues of morphological exponence. *Yearbook of Morphology* 2001. 1–18.

Anderson, Stephen R. 2004. Morphological universals and diachrony. *Yearbook of Morphology* 2004. 1–17.

Anderson, Stephen R. 2005. *Aspects of the theory of clitics*. Oxford: Oxford University Press.

Arnott, D. W. 1970. *The nominal and verbal systems of Fula*. Oxford: Clarendon Press.

Aronoff, Mark. 1976. *Word formation in generative grammar*. Cambridge, MA: MIT Press.

Aronoff, Mark. 1994. *Morphology by itself*. Cambridge, MA: MIT Press.

Aronson, Howard I. 1982. *Georgian: A reading grammar*. Columbus, OH: Slavica.

Baudouin de Courtenay, Jan. 1895 [1972]. An attempt at a theory of phonetic alternations. In Edward Stankiewicz (ed.), *A Baudouin de Courtenay anthology*, 144–212. Bloomington, IN: Indiana University Press.

Bazell, C. E. 1952. The correspondence fallacy in structural linguistics. *Studies by Members of the English Department, Istanbul University* 3. 1–41.

Bergen, Benjamin K. 2004. The psychological reality of phonaesthemes. *Language* 80. 290–311.

Bloch, Bernard. 1947. English verb inflection. *Language* 23. 399–418.

Bloomfield, Leonard. 1933. *Language*. New York: Holt.

Broadwell, George Aaron. 1993. Subtractive morphology in southern Muskogean. *International Journal of American Linguistics* 59. 416–429.

Broadwell, George Aaron. 2006. *A Choctaw reference grammar*. Lincoln and London: University of Nebraska Press.

Brugmann, Karl. 1908. Formans oder Formativum? *Anzeiger für indogermanische Sprach- und Altertumskunde* 22. 69–72.

Carstairs-McCarthy, Andrew. 2005. Basic terminology. In Pavel Štekauer & Rochelle Lieber (eds.), *Handbook of word formation*, 5–23. Springer.

Chomsky, Noam. 1957. *Syntactic structures*. The Hague: Mouton & Co.

Corbin, Danielle. 1987. *Morphologie dérivationelle et structuration du lexique*, vol. 193, 194, Linguistische Arbeiten. Tübingen: Max Niemeyer Verlag. [two volumes].

Donohue, Mark. 2003. Agreement in the Skou language: A historical account. *Oceanic Linguistics* 42. 479–498.

van Driem, George. 1997. A new analysis of the Limbu verb. In David Bradley (ed.), *Tibeto-burman languages of the Himalayas*, vol. 14, Papers in Southeast Asian Linguistics, 157–173. Canberra: Pacific Linguistics.

Elson, Benjamin & Velma Pickett. 1965. *An introduction to morphology and syntax*. Santa Ana, CA: Summer Institute of Linguistics, 4th edn.

Halle, Morris. 1973. Prolegomena to a theory of word formation. *Linguistic Inquiry* 4. 3–16.

Halle, Morris. 1990. An approach to morphology. *Proceedings of the North Eastern Linguistic Society*

20. 150–184.
Halle, Morris & Alec Marantz. 1993. Distributed morphology and the pieces of inflection. In Kenneth Hale & Samuel Jay Keyser (eds.), *The view from building 20*, 111–176. Cambridge, MA: MIT Pres.
Harris, Alice C. 2009. Exuberant exponence in Batsbi. *Natural Language and Linguistic Theory* 27. 267–303.
Harris, Zellig. 1942. Morpheme alternants in linguistic analysis. *Language* 18. 169–180.
Hjelmslev, Louis. 1943. *Omkring sprogteoriens grundlæggelse*. Copenhagen: Ejnar Munksgaard. Translated 1953 by Francis Whitfield as *Prolegomena to a Theory of Language*.
Hockett, Charles F. 1947. Problems of morphemic analysis. *Language* 23. 321–43.
Hockett, Charles F. 1954. Two models of grammatical description. *Word* 10. 210–34.
Jakobson, Roman. 1936. Beitrag zur allgemeinen Kasuslehre. *Travaux du cercle linguistique de Prague* 6. 240–288.
Jakobson, Roman. 1939. Signe zéro. In *Mélanges de linguistique offerts à Charles Bally*, 143–152. Geneva: Georg.
Jones, Daniel. 1962. *The phoneme: Its nature and use*. Cambridge: W. Heffer & Sons, 3rd edn.
Kimball, Geoffrey D. 1991. *Koasati grammar*. Lincoln and London: University of Nebraska Press.
Langdon, Margaret. 1970. *A grammar of Diegueño: The Mesa Grande dialect*. Berkeley: University of California Press.
Lieber, Rochelle. 1980. *On the organization of the lexicon*. Ph.D. thesis, M.I.T. Published by Indiana University Linguistics Club, 1981.
Lieber, Rochelle. 1992. *Deconstructing morphology*. Chicago: University of Chicago Press.
Martinet, André. 1960. *Éléments de linguistique générale*. Paris: Armand Colin.
Matthews, Peter H. 1972. *Inflectional morphology*. Cambridge: Cambridge University Press.
McCarthy, John J. 1981. A prosodic theory of non-concatenative morphology. *Linguistic Inquiry* 12. 373–418.
Meillet, Antoine & Joseph Vendryès. 1924. *Traité de grammaire comparée des langues classiques*. Paris: Édouard Champion.
Mel'čuk, Igor. 1997. *Cours de morphologie générale*, vol. 4, Cinquième partie: Signes morphologiques. Montréal: Les Presses de l'Université de Montréal.
Mugdan, Joachim. 1986. Was ist eigentlich ein Morphem? *Zeitschrift für Phonetik, Sprachwissenschaft und Kommunikationsforschung* 39. 29–43.
Mugdan, Joachim. 2011. On the origins of the term *phoneme*. *Historiographia Linguistica* 38. 85–110.
Nida, Eugene. 1948. The identification of morphemes. *Language* 24. 414–441.
Orešnik, Janez & Magnus Pétursson. 1977. Quantity in modern Icelandic. *Arkiv för Nordisk Filologi* 92. 155–171.
Ottósson, Kjartan G. 1992. *The Icelandic middle voice: The morphological and phonological development*. Ph.D. thesis, Lund University.
Press, Ian. 1986. *A grammar of modern Breton*. Berlin: Mouton de Gruyter.
Robins, R. H. 1959. Nominal and verbal derivation in Sundanese. *Lingua* 8. 337–369.
Sammallahti, Pekka. 1998. Saamic. In Daniel Abondolo (ed.), *The Uralic languages*, 43–95. London and New York: Routledge.
de Saussure, Ferdinand. 1916 [1974]. *Cours de linguistique générale*. Paris: Payot, critical edn. [prepared by Tullio de Mauro].
Selkirk, Elizabeth. 1982. *The syntax of words*. Cambridge MA: M.I.T. Press.
Siegel, Dorothy L. 1974. *Topics in english morphology*. Ph.D. thesis, M.I.T.
Sneddon, James Neil. 1996. *Indonesian: A comprehensive grammar*. London and New York: Routledge.

Spencer, Andrew & Arnold Zwicky (eds.). 1997. *Handbook of morphology*. London: Basil Blackwell.
Steele, Susan. 1995. Towards a theory of morphological information. *Language* 71. 260–309.
Stump, Gregory T. 2001. *Inflectional morphology: A theory of paradigm structure*. Cambridge: Cambridge University Press.
Wells, Rulon S. 1947. De Saussure's system of linguistics. *Word* 3. 1–31.
Williams, Edwin S. 1981. On the notions 'lexically related' and 'head of a word'. *Linguistic Inquiry* 12. 245–74.
Williams, Edwin S. 1989. Maximal projections in words and phrases. In Mark R. Baltin & Anthony S. Kroch (eds.), *Alternative conceptions of phrase structure*, 280–291. Chicago: University of Chicago Press.
Wolfart, H. Christoph. 1973. Plains Cree: A grammatical study. *Transactions of the American Philosophical Society* 63(5). 1–90.
Zwicky, Arnold M. 1985. How to describe inflection. *Proceedings of the Annual Meeting of the Berkeley Linguistics Society* 11. 372–86.