

Morphology (8)

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1 Course organization

Teacher: John Goldsmith

Office hours Tuesday, Thursday 10-11 in Walker 201. I will be relatively available throughout those two days; just email ahead of time.

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1.1 Calendar

The readings given below should be read *before* you come to the class indicated.

1. Week 1: Monday, January 7.

Overview of the course.

2. Wednesday, January 9.

Practicum. Reading: Bauer, Chapters 1 and 2, pages 3-23. Yimas: parsing words into morphemes. Homework: Sierra Popoluca problem, due Friday Jan. 18.

3. Friday, January 11– Week 2: Monday January 14.

Expressing generalizations in morphology. Reading: For Jan 11: Bauer, Chapter 3, pages 24-53. For Jan 14: Bloch and Trager (see below). Terminology, some of which you have seen before: Roots, stems, and affixes. Morphs and morphemes and allomorphs. The major *functions* of morphology:

- (a) Inflectional morphology. Inherent features versus context features (agreement and government). Difference between agreement and government. The concept of a lexeme, and of a paradigm.
- (b) Derivational morphology
 - i. Word-formation
 - A. From a single stem
 - B. From multiple stems (compound formation)
 - ii. Cryptical morphology (not a standard term!): language games (Pig Latin, etc.), nicknames, clippings (advertisement > ad), acronyms. (By the definition above, this could fall under inflectional morphology—but that is a sign that the definition isn't quite right.)

Formal methods for realizing the functions of morphology:

- (a) affixation (prefix, suffix, infix, superfix)
 - (b) truncation (deletion)
 - (c) conversion: doing nothing (no affix, no truncation, no nothing)
 - (d) reduplication
 - (e) skeletal (autosegmental)
4. Week 2: Wednesday January 16 – Friday January 18.
Segmentation and economy of description: The data from Yimas. Spanish verbs. The reading is from course notes online.

(Week 3: Monday, January 21 is a holiday.)

5. Week 3: Wednesday January 23
Wordhood Reading: Chapters 4 and 5; we will primarily discuss Chapter 4 in class.
6. Week 3: Friday January 25 **Derivational and inflectional morphology.** Reading: Chapter 6.
 - (a) We always make some assumptions about the relationship between these components when we work on them. Inflectional morphology is at work when we believe that the (external) distribution of a word is independent of the inflectional choice. This is a characterization of what the syntax is and isn't responsible for. To put it another way: any changes in the (internal) morphology of a word that you do not expect to cause a difference in shape of the syntactic tree are changes in the inflectional morphology.
 - (b) Separating inflectional and derivational morphology. How to treat compounding and cryptical morphology .
 - (c) The lexicalist hypothesis. Examples and discussion. What is the chunk size at which we expect semantic regularity to appear? Is that question related to the definition of syntax? Inflectional stem; but what of verb + particle pairs, and verb + prepositions?
 - (d) Prenominal phrases in English: what is *a come-hither look*, or a *stay-at-home dad*?
7. Week 4: Monday, January 28. Discuss Stephen Anderson "Inflectional morphology." Wednesday, January 30. Discuss Chapter 7, The morpheme. Friday, Feb 1. Discuss Zellig Harris 1942.
8. Week 5: **Clitics.** Monday, February 4, discuss Chapter 8. Wednesday, February 6, Discuss Zwicky-Pullum.
9. Week 6: February 11. Discuss Chapter 9. Hand in short description of your problem set. February 13: discuss Hockett 1954.
10. Week 7: Monday February 18. Finish discussion of Hockett 1954. Wednesday, February 20: Word-and-paradigm; discuss Chapter 11. Friday, February 22: Discuss the chapter by Gregory Stump.
11. Week 8: Monday, February 25: Stratally organized morphology. Read Chapter 8. Wednesday, February 27: Arabic templatic morphology. Read Chapter 12. Friday March 1: English creates new words.
 - (a) verb-particle
 - (b) radar, gaydar, etc;
 - (c) -nik suffix
 - (d) -holic suffix
 - (e) Blends
 - (f) Acronyms
12. Week 9: Monday, March 4: More processes in productive English morphology. Wednesday March 6: Bantu noun classes. Friday, March 8: Morphophonology.
13. Week 10: Monday: Basque morphology. Wednesday: Morphophonology.

1.2 Homework

Homework policy: Deadlines for homeworks are a must both for the student and for the grader. However, I recognize that life often gets in the way of getting things done on time as well as one hopes for. Therefore I am very lenient on giving extensions, under two conditions: you have to ask for the extension before the assignment is due, and you have to give an honest reason (I'm not in the judgment business, so I recognize that an honest reason may include oversleeping or undersleeping, or issues that superficially have nothing to do with this course).

The required work for the course includes the homeworks below, plus the creation of a problem set by each of you. You can take one of the problems below as a model, but make it from other data, and provide an answer. There should be at least 40 words in the data (there's no upper limit). If you possibly can, do it in latex.

- Due January 18 (Week 2) Sierra Popaluca 1.
- Due January 25 (Week 3) Part 1: Inuktitut problem. Part 2: Compute the complexity of the Yimas analysis that we have discussed in class.
- Due February 1 (Week 4) Michoacan Aztec.
- Due February 8 (Week 5) Sierra Popoluca Part 2.
- Due February 11 (Week 6): Short description of the problem you will design and create.
- Due February 15 (Week 6) Futa Fula, maybe.
- Due February 22 (Week 7) Finnish noun inflectional classes. Basque non-finite verb forms.
- Due March 1 (Week 8) German verbs. -ize.
- Due March 8 (Week 9) Basque auxiliary.

1.3 Readings

We will use *Introducing Linguistic Morphology* by Laurie Bauer as a text. I think it is a very good book, at an introductory level, and it does not in any way insult the intelligence of the reader. We will also read and discuss some papers: two great classics, by Zellig Harris and Charles Hockett, and a couple of more recent papers.

Additional readings:

1. Bloch and Trager: *Outline of Linguistic Analysis* pages 61-70 (Chapter 4, Morphology). A clear statement of the Bloomfieldian view of morphology.
2. Zellig Harris 1942: "Morpheme alternants in linguistic analysis." One of the first post-Bloomfieldian statements of morphological analysis.
3. Stephen R. Anderson, "Inflectional morphology."
4. Zwicky and Pullum
5. Gregory Stump, Chapter 1.
6. Charles Hockett 1954:

7. Goldsmith 1990 Chapter 5
8. Recommended: Hockett 1947: "Problems of morphemic analysis." A response to Harris.
9. Recommended: Nida 1948: a response in *Language* to both Harris and Hockett.
10. Recommended: P. H. Matthews, *The inflectional component of a Word-and-Paradigm Grammar*.
11. Recommended: Arnold Zwicky. Clitics and particles. *Language* 61:283-305. 1985.

Graduate reading? Syncretism (Topic 3): G.T.Stump, On rules of referral, *Language* 59 1993 449-479.
 Paradigm Economy Principle: Topic 3 Andrew Carstairs, Paradigm economy, in *J of L*, 19 1983, 115-128.
 English argument linking: Topic 7 Rochelle Lieber, Argument linking and compounds in English, *LI* 14 251-286. 1983.

2 Basics

[Monday, January 14] Morphology is the study of the structure of words and of the lexicon, which is the set of words of a language.

2.0.0.1 The relation of morphology to syntax and phonology Morphology is a deceptively complex area to study, for two reasons. The first is that we think we know a lot about what words are in the languages that we speak and use in the Western world, but when we press those beliefs, we find that we have many assumptions that are difficult to justify (and justification is a big part of what we are here to be concerned with). The second is that there are very important interactions between the theory of syntax and the theory of morphology, and what works well as an assumption in one of those domains may work very badly in the other. To be a linguist, and to deal with both components, means taking both sets of concerns equally seriously, but this can be an extremely challenging task, from a purely intellectual (or scientific) point of view. And worse yet: the very same thing is true about the relationship of the theory of phonology and the theory of morphology. Assumptions about one can have serious and often unexpected consequences for the other. In short, to do morphology well, we have to take the theory of phonology into consideration as well.

2.0.0.2 Analysis and synthesis; induction and deduction There are two different ways of thinking about what linguistics is, and what linguists do, one which takes linguistics to be a project that takes a lot of utterances as its domain (its *input*, we might say today), and which creates an analysis, a simpler way to describe and therefore understand the large, the potentially infinite, thing that is a language. Linguistics, in this sense, goes from data to analysis.

If that is the analytic or inductive side of linguistics, its synthetic or deductive side is the view that what lies at the heart of a language is the grammar of that language; that grammar has an elegance and a beauty and it can in some fashion generate a vast range of utterances. The architecture of the grammar is not found in any obvious way in the data, the utterances, but the architecture brings organization to the data.

Both of these ways of thinking of linguistics are essential to a healthy and whole understanding of the field. American structuralists focused on the first; generative grammarians focus on the second. We will try to focus equally on both. That will mean often taking a single question and asking what each perspective has to say about it.

[An example] Here is an example of a case where the inductive perspective can be handy and helpful, and it involves the simple question: what do we study when we study morphology?¹ Let us take a good

¹We are going to assume for a while that we know what a word is in a language that we study. This is sometimes a dangerous assumption, but it usually is not, and it is not unreasonable. It is like starting the study of syntax with the assumption that we can recognize complete sentences.

sample of a language divided up into words, and then sort the list (so that we can focus on word properties and ignore syntax!)— the sorting is just a kind of mental warm-up exercise; for present purposes, it doesn't matter what principles we use to sort the words.

[Definition: patterns, redundancies] Now we can define morphology as the discovery of patterns (or redundancies) in that list of words.²

Let me explain a bit why I say that, before trying to defend it against criticisms or concerns.³

Here is the beginning of a real list of words from a real text:

a	aah	aahed	aahing
aahs	aardvark	aardvarks	aardwolf
ab	abaci	aback	abacus
abacuses	abaft	abalone	abalones
abandon	abandoned	abandonedly	abandonee
abandoner	abandoners	abandoning	abandonment
abandonments	abandons		

Even if you didn't know the language, you would see that there is a significant redundancy or pattern right there: there are nine words that begin with the seven letters *abandon*. That cannot be a coincidence, almost surely. Less interesting, but still pretty suggestive, is the four appearances of *aah*; and the pattern is deeper still, because *aah* appears with exactly these continuations: *ed*, *ing*, *s*, and those appear after *abandon*, too. These are patterns which appear over and over again in the words that follow on this list. Morphology is charged with capturing all patterns, and these are in-your-face patterns, ready for our capture.

2.0.0.3 Dynamic and static metaphors of morphology (like syntax?) Much of our study of morphology concerns how pairs (or more generally, sets) of words are related to each other (e.g.), and sometimes we think of this in a dynamic way – we say that *books* is derived from *book* by adding an *s*. On some occasions we might prefer not to use such a dynamic metaphor, and we say simply that *books* is analyzed into the stem *book* and the suffix *s*. But in some cases, it is extremely tempting to insist on a dynamic vocabulary, allowing us to say that one word is derived from another. Perhaps the clearest case is that of Pig Latin, or other language games. We turn *game* into *ame-gay*, don't we? And the same can be said for reduction processes, often called *clippings*. Some frameworks attempt to avoid any dynamic metaphors. I have no problem with dynamic metaphors, but we should know what we are committed to when we use one.

2.0.0.4 Morphemes Morphemes are (in a sense) the flip-side of dynamic views of how two words are related morphologically: in the sense that sometimes the morpheme-based view and the dynamic-view are alternative ways of analyzing the same data. But it is very difficult, I think, to dismiss the idea of the morpheme, which is this: that in most languages, most words are morphologically composed of more than one piece (we call the pieces morphemes), and the words are formed by concatenating these morphemes. The details may change, but that's the basic idea.

What is a morpheme? There are several different definitions, which means that there are several traditions of thinking about this. The traditional American structuralist way was based on first defining a *morph*, and

²That is defining morphology as an activity; you can define it more passively if you like as a kind of knowledge.

³By sorting the words, we have removed any patterning in the utterance that is the responsibility, so to speak, of the domain of syntax, but we have not really eliminated patterns that are the responsibility of phonology. Distinguishing phonology and morphology is a bit trickier, in part because some aspects of phonology do not want to be separated from morphology. As a first approximation, we can say that in looking for morphological patterns or redundancy, we are not interested in any patterns that could just as well have been defined on the original corpus with the word boundaries removed.

then defining *morpheme* in terms of morphs. The intent was to make these concepts be as parallel as possible to *phone* and *phoneme*. A morph was the smallest unit of sound which had a consistent pairing with meaning. A morpheme was a collection of morphs all of which were associated with the same meaning, and all of which were used in complementary distribution.

This works very well in a lot of cases (I almost wrote, “simple cases”). Let’s look at a case where it seems to work fine, and then raise some questions. Consider the words *walk*, *walks*, *walked* *walking*. If we compare them in a pairwise fashion (there are six pairs of words in their—do you see that?), we see that they all share *walk* at the beginning, and the remainders at the end involve the sequences *s*, *ed*, *ing*, and nothing at all, which we will write sometimes as ϵ and sometimes as NULL, depending on what is convenient. It seems very reasonable to say that the sequence *walk* is associated with the same meaning in all four cases, and it is reasonable to say that *s*, *ed*, *ing* each are associated with a consistent meaning, but this is because we implicitly are drawing other comparisons in which we find the same suffix when we look at other sets of words, like *jump*, *jumps*, *jumped*, *jumping*. There is already something a bit funny about saying that NULL is associated with a consistent meaning, because NULL isn’t something that appears anywhere in particular in the word *walk*—it is really just the linguist’s way of saying that when we compare *walk* with *walking*, there is nothing in *walk* that corresponds to the *ing*.

The same could be said for analyzing words like *book*, *books*, *card*, *cards*, *table*, *tables*, and so on. Of course, we have the same concern here, because we are saying that NULL is associated with a consistent meaning. In addition, we have to take note of the fact that in these two cases we have identified two distinct morphemes whose phonological form is the same (*s*), and we do not mean that the meaning is the same in these two cases. So when we say that a morpheme is a consistent pairing of meaning and phonological form, we do not mean that two morphemes may not share the same phonological form (or meaning, for that matter.)

[Again, what is a word?] It would be great if we could propose some clear ideas as to what a word is, from a morphological point of view, before we got too far into our investigation. Unfortunately, we are not able to. There will be time to admit that there are some corners of many languages (all languages, I think) where it is not at all obvious how an utterance ought to be divided up if we choose to find the words that are there. I will offer a few examples from English in a moment. At the same time, speakers of English and most other languages are also aware of subparts of words (larger than the sounds), and this decomposition of words into morphs (and morphemes and perhaps other units) is a big part of what we are concerned with in developing a theory of morphology. It is not hard to find observations by linguistically observant people that validate the notion that people are sensitive to words and sub-word units. Here is an example from a recent best-seller:

Bref, moi je pense que le chat est un totem moderne. On a beau dire, on a beau faire des grands discours sur l’évolution, la civilisation et tout un tas d’autres mots en “tion”, l’homme n’a pas beaucoup progressé depuis ses débuts. From: *L’élégance du hérisson*, Muriel Barbery.

2.0.0.5 Concatenative morphology : we will spend a good deal of time looking at concatenative morphology, largely because most morphology is concatenative, and it is the easiest to analyze, all other things being equal. The word *concatenative* is related to *concatenation*, which involves joining two strings together. Concatenative analysis involves analyzing words into two or more pieces which are concatenated. When these pieces are morphemes—in the sense that there is a consistent pattern associating form with meaning—the analysis is morphological. (Can you imagine some way which was not concatenative? We will see many examples of alternatives to concatenation.)

2.0.0.6 Affixes and roots We divide morphemes into two large classes: affixes and roots. The distinction is usually easy to make, though not always. A word must contain a root, but it need not contain an affix. A root has a meaning independent of the grammatical structure of the language, and typically has a direct translation in another language, something not true of affixes. Typically roots are of lower frequency than affixes, and typically roots are longer than affixes.

[January 18 II/3]

2.0.0.7 Stems We can't define what we mean by a stem until we draw a distinction between inflectional and derivational morphology. Once we have explained that, we will say that the stem is the string composed of a root (and possibly some affixes) to which inflectional affixes are concatenated (prefixed or suffixed).

2.0.0.8 Three major functional components of morphology I would like to suggest that we can divide the analysis of words into three categories: Inflection, derivation, and cryptional. "Cryptional" is a word I just invented, but I will explain why I think it is useful here. Other linguists might set up three different categories: inflection, derivation, and compounding. I will include compounding in derivation, but I have no strong objection to making it a separate bloc.

2.0.0.9 Inflectional morphology The essence of inflectional morphology is this: a language will organize a particular major part of speech according to a relatively small number of relatively independent dimensions; these different dimensions are assigned a role in the larger grammar, either in connection with government or concord, or more directly in terms of meaning. This has the consequence that there will be entire families of words that correspond to each other among these various dimensions, and we refer to that whole family as a single **lexeme**. In French, *veux*, *veut*, *voulons*, *vouloir*, and quite a few more forms of the word that means *want* in English all belong to the same *lexeme* in French. Some linguists use ALL CAPS to mark a lexeme, like this: CLIMB.

So to study inflectional morphology means doing two things: (i) establishing a multi-dimensional structure where an individual dimension will bear a label such as number (= singular/plural), or person (1st/2nd/3rd), or tense (past/present or past/present/future), or voice (active/passive), etc.; and (ii) providing an account of how a word is constructed once we have specified each of these dimensions. If we have a French verb *marcher* (to walk), how do we form the future 1st person plural indicative? That is the second question.

When we think about an inflectional paradigm, we should be visualizing a large cube (or really a hypercube, because there are almost always more than three dimensions involved) or something much like a cube, almost like a Rubik's cube; the big hypercube is divided up into small hypercube based on the morphosyntactic features used by that lexeme's part of speech. So each small cube is assigned a specific and unique set of values for each of the morphosyntactic features. It is important to be able to visualize this—

So from a practical point of view, inflectional morphology is closely related to the *features* (in this case, *morphosyntactic* features) of a particular word—an instance of a lexeme. We will have more to say about features, and how they are to be represented. But we can say this: all of the information associated with a morpheme is closely related to a choice of morphosyntactic features. This will not be true for derivational morphology.

Inflectional morphology is distinct from derivational morphology, which is concerned with the morphological principles that relate two distinct lexemes.⁴

⁴Stump 1998 observes: 'The notion of inflection rests on the more basic notion of lexeme... Once the existence of lexemes is assumed... morphological devices can be used to deduce the words constituting a lexeme's paradigm from that lexeme's root(s)... Morphology put to ... paradigm-deducing use is *inflectional*.' (13ff).

<i>aller to go</i>				
Present tense		past imperfect		
person	singular	plural	singular	plural
1st	vais	allons	allais	allions
2nd	vas	allez	allais	alliez
3rd	va	vont	allait	allaient

Table 1: Part of an inflectional paradigm: French

derivation and inflection are not kinds of morphology but rather uses of morphology: inflection is the morphological realization of syntax, while derivation is the morphological realization of lexeme formation. (1994:126, cited in Stump 1998 p. 19)

It is a fact that there are a handful of features (or dimensions) that are used over and over in inflectional systems around the world: for nouns (or noun phrases), number (singular, plural) are often used, as is case (and languages may differ regarding how many cases they use). For verbs, person (1st, 2nd, 3rd) and number are important, in some languages for both subject and object; for others, just the subject; for still others, it is some combination of those two (I'm thinking of what are called ergative systems).

We often say that **inflectional affixes** indicate *grammatical information* (tense, number, person...) but don't change category. What does that *mean*?

When we linguists say that, we mean that our statements about syntax will remain the same regardless of which particular choice of the inflectional paradigms is used in a sentence. We find the verb in the same place in a French sentence regardless of what person, number, or aspect it is in; this is what we mean when we say that inflectional morphology does not change part of speech.

This means essentially this: if you have a syntactic analysis (a tree), and you change the inflectional features of one of the words, you may need to change inflectional features elsewhere in the tree, but no other changes (especially placement) should be entailed. Counter-examples??

You often hear it said, "inflectional morphology is that which is relevant to the syntax," which almost seems the opposite of what I just said, but it's not. The part of inflectional morphology that is relevant for the syntax is the "transmission" of (morphosyntactic) features via **agreement and government**.

Inflectional features are generally divided into those that are **inherent**, and those that are involved in syntactic phenomena of agreement or government, which have been called **contextual**.

English has pretty anemic inflectional morphology:

Remember: when we say we are investigating inflectional morphology, that is a statement about the system of features (you might say: information) that is being encoded; it does not say how that information is spelled out. The spelling out is typically with prefixes and suffixes, but those are not the only ways possible.

There are also other ways to mark inflectional contrast:

- **ablaut** (quasi-predictable vowel change)
- **suppletion** (substituting one form for another)

When a rule of syntax (grammar) involves agreement between two words in a sentence for some grammatical feature, the realization of that feature by each of the words is part of inflectional morphology.

Examples: subject-verb agreement; noun-adjective agreement.

2.1 Evidence of word-hood

Based on Bauer's Chapter 4.

1. When we know how to read and write a language, we may overestimate the consistency of our intuitions about what a word is. Bauer: *nonetheless, all right, insofar as*. German has a different problem of consistency: *aufhören* to stop but *ich höre auf* | stop. *Hör doch endlich auf!* Stop it!
2. We can try to develop criteria based on phonology; on syntax; and on meaning.
3. Phonology: There do not appear to be language-independent phonological criteria. In a language-particular way, we find many languages with stress facts that are relevant; also, vowel harmony.
 - Stress: in many languages, there is a (word-)positional stress system: stress on the first, penultimate, antepenultimate syllable. Swahili is a good example of a penultimate stress language: *watóto wadógo waíne háwa* these four small children. lit., children small four these. Czech, Finnish, Icelandic: stress on first syllable.

- Vowel harmony:

ott-a	s/he takes	pitä-ä	s/he likes
otta-vat	they take	pitä-vät	they like
otta-vat-ko	do they take	pitä-vät-kö	do they like

- Different phonology inside a word versus across different words. English flapping of *t* appears to be an example (though if we scratch the surface, what we find is that the difference derives from different patterns of syllabification inside a word and across different words).

Inside a word, flapping is sensitive to stress on either side, while flapping of initial *t* never occurs (except with the morpheme *to*), and flapping of word-final *t* occurs independent of stress when the next word begins with a vowel.⁵

⁵One of the most striking characteristics of American English is the widespread appearance of the coronal flap [ɾ] as a realization of /t/ as well as /d/, and the principles that lie behind the distributional generalizations of the flap have led linguists to view the conditioning to be based on syllable affiliation: a coronal stop /t,d/ is realized as a flap if it is simultaneously a member of the coda of one syllable and the onset of the next syllable.

It is not hard to find phonological descriptions of American flapping which state a generalization along these lines: A coronal stop is realized as a flap when it is immediately preceded by a stressed vowel, and immediately followed by an unstressed vowel, in *Italy*. While this is true, it is only a small part of the story. In the real description of American flapping, it is first of all necessary to distinguish the conditions under which word-internal /t/s are flaps from the conditions under which word-initial /t/s and word-final /t/s are. Consider first the case of strictly intervocalic, word-internal /t/s, where the facts roughly follow the description just given. The context *ɪ-ʏ* mentioned there is, in fact, a position in which flap obligatorily appears: for example, *Italy* [ɪrəlɪ]. There are three other strictly intervocalic contexts to consider: *ɪ-ʏ*, *ʏ-ɪ*, and *ʏ-ʏ*. In the first two, we do not get a flap at all; it is not possible in words such as *bótɔx*, *détàil*, *rétàil*, *látèx*, *Útàh*; or *Ítálian*, *áttáin*, etc. In the third case, where the /t/ is surrounded by unstressed vowels, as in *sanity* or *opacity*, both flapped and unflapped variants are possible (they are equally acceptable to this writer). The generalization does not change (here as elsewhere) when we extend the context to include a preceding *r*; *parting* and *potting* have flaps just the same. The same is not true of other sonorants: a /t/ will not flap after /l/; we have *faulty* with no flap possible, for example. (There is a complication when a syllabic *n* follows the /t/, as in *Latin*, which we will ignore here.)

Word-final /t/ may always be pronounced [t̚], a glottalized and unreleased [t], associated with at least a weak phrasal boundary immediately following, but in connected speech, when the following word begins with a vowel, regardless of whether the vowel is stressed or unstressed, a flap is found—and this is true whether the vowel preceding the /t/ is stressed or unstressed. Examples of the four cases, where the [ɾ] realizes a /t/: *Gè[r] ūs out of here!* *Gè[r] out of here!* *A lockč[r] ōf hair.* *The rabbī[r] áte the carrot.* In these cases, an empty onset attracts a preceding consonant, even if the consonant is ‘already’ syllabified. The result of this is that the /t/ is ambisyllabic, and ambisyllabic /t/s are flapped. This is not a case of maximizing onsets; a /t/ does not resyllabify before an *rV* sequence, for example (*the ha[t̚] ripped*, with no possibility of the /t/ being part of an onset-cluster).

The third case, that of the word-initial /t/, depends, curiously enough, on the particular word in which it is found. If the

- Word-final devoicing

Singular		Plural		
Bad	[ba:t]	Bäder	[bɛ:də]	bath
Raub	[rawp]	Raube	[rawbə]	robbery
Zug	[tsu:k]	Züge	[tsy:gə]	train

- The distinct parts (stems) of a compound, however, typically show the behavior of separate words: e.g., English *nitrate* versus *nightrate*.

4. Bloomfield: “minimum free form.” We take utterances, and look to see what subparts could be uttered as independent utterances. Such minimal units are words.

- positional mobility, i.e., syntactic movement, i.e., distinct sentences related transformationally: *We must see this This we must see. I know I put my mug on the shelf, but yours I can't find.* This is another way of saying that non-local syntax does not analyze constituents (units) smaller than a word.
- uninterruptability: Bauer says, “extraneous material cannot be introduced into the middle of the word-form” (63).
- Order of morphemes within the word⁶ is fixed, and by principles different from those of syntax. Usually non-contrastive; but there is a lot of discussion of the possibility in *some* languages that scope differences of causative and reflexive (for example) can be determined by morpheme order, i.e., order is contrastive. They made each other eat vs.

Morphemes in English: NULL - s - ed - ing - es- er - 's - e - ly - y - al - ers - in - ic - tion - ation - en - ies - ion - able - ity - ness - ous - ate - ent - ment - t (*burnt*) - ism - man - est - ant - ence - ated - ical - ance - tive - ating - less - d (*agreed*) - ted - men - a (*Americana, formul-a/-ate*) - n (*blow/blown*) - ful - or - ive - on - ian - age - ial - o (*command-o, concert-o*) ...

3 Segmentation

Consider the present tense conjugation of the Hungarian verb to remain:

word is *to, today, tonight, tomorrow, or together*, then we find one behavior, which I will temporarily refer to as *to*-behavior; if the word is any other (for example, *tomato, tuba, Topeka, topology, Thomas, taste*), we find a different behavior. Furthermore, the realization is largely independent of whether the preceding vowel is stressed or not, and largely independent of whether the following syllable is stressed or not. There is no flap in *the tomato, a tenacious opponent, or a topology*, where the /t/ is in an unstressed syllable, nor in *the total or the toast*, where /t/ is in a stressed syllable. Thus this case is entirely different from either the word-internal or the word-final case.

However, in the case of the handful of words based historically on the preposition *to* (*to, today, tonight, tomorrow, and together*), the facts are different. In each case, flapping is possible (indeed, preferred) when the preceding word is vowel-final: *Go [r]o sleep! How'd it go [r]oday?*, etc.

A natural way to interpret this data involves two passes of syllabification. The first applies word-internally, syllabifying a segment to an immediately following vowel, regardless of stress, and a rule that adds a syllable link between any open syllable and an immediately following consonant in the word (optionally if the syllable is unstressed, and obligatorily if the syllable is stressed). This results in an ambisyllabic consonant. At the phrase level, only one rule is operative: a word-final consonant adds an affiliation to a following syllable if it begins with a vowel in the same phonological phrase. That rule also results in an ambisyllabic consonant. Given these two rules, we may say that any, and only, ambisyllabic /t,d/ is realized as a flap [ɾ]. The *t* – initial words that we noted above are all cliticized to the word that precedes, in the sense that it is treated as a single phonological word with what precedes it.

⁶if we accept the notion that there are morphemes

- maradok maradunk
 (1) maradsz maradtok
 marad maradnak

It is not hard to see that a natural way to segment these words is:

- marad-ok marad-unk
 (2) marad-sz marad-tok
 marad marad-nak

We often write this this way, which emphasizes that there are six morphemes, each of which is an alternative to the others, and the linear order is as indicated—the affixes follow the root *marad*.

$$\left(\begin{array}{c} \text{ok} \\ \text{sz} \\ \text{unk} \\ \text{tok} \\ \text{nak} \end{array} \right)$$

On this analysis, the stem is consistently *marad*, and we have six different suffixes (if we count the 3rd person singular null suffix as a suffix).

Now consider this data, which illustrate the present tense forms of two similar verbs in Spanish:

(3)

	sing	call
1st Sg	canto	llamo
2nd Sg	cantas (cantás)	llamas (llamás)
3rd Sg	canta	llamo
1st Pl	cantamos	llamamos
2nd Pl	cantáis	llamáis
3rd Pl	cantan	llaman

One way in which we could segment these words into morphs in the following :

	Sg.	Pl.
1st Sg	cant-o	llam-o
2nd Sg	cant-as	llam-as
3rd Sg	cant-a	llam-a
1st Pl	cant-amos	llam-amos
2nd Pl	cant-áis	llam-áis
3rd Pl	cant-an	llam-an

And we can abstract a pattern of suffixes, and a list of stems, given that segmentation:

Stems	Suffixes	
cant	1st Sg -o	cant $\left\{ \begin{array}{l} o \\ as \\ a \\ amos \\ ais \\ an \end{array} \right\}$ llam
llam	2nd Sg -as	
	3rd Sg -a	
	1st Pl -amos	
	2nd Pl -áis	
	3rd Pl -an	

These are the simplest kind of morphological patterns that we can find — and all linguistic analysis is the discovery of patterns—i.e., regularities, generalizations, redundancies. If we totally ignore syntax, we just consider a text to be a sequence of words—in fact, we can go one better, and just consider the alphabetized list of words given to us. Then we look for patterns of this sort that make explicit the redundancies that are inherent in the data.

Of course, that discovery is just the beginning: we also want to know why we have these different affixes, and what their role is in the language, from the point of view of meaning or function.⁷

3.1 Calculating the complexity of an analysis

Theories should be as simple as possible, but no simpler. Albert Einstein, maybe.

Theories should be as complex as necessary, but not more. Someone else.

[Covered this material January 16 Wednesday of Week 2]

The task of defining a complexity of a morphological model is a way of making a theoretical claim about natural language morphology. There are multiple ways of analyzing a set of words: the two worst ways are to treat each word as a single (unanalyzed) morpheme, and to treat each phoneme (or letter) as a separate morpheme. The right analysis is somewhere in-between. We aim to find a way of specifying complexity which is less complex than either of these. Ideally, we would develop a complexity measure with this property: the most linguistically reasonable analysis turns out to be the one with the smallest complexity, every time.

We will use the word *cost* as a short synonym for *complexity*.

We will frequently talk about t : lists of morphemes, or lists of patterns (which means: lists of lists). The cost of a *list*, we will assume, is equal to the number of items in the list, plus the cost of each of the individual items in the list. If the list has only one member, we do not charge 1 bit for that.⁸

When an item in a list includes an individual morph, the cost of the morph is equal to times the number of letters in the morph. (If a morph is phonologically null, we will assume that counts as a single phoneme/letter.) We will assume that equals 5. The cost of a single grammatical features we denote as , and we will assume = 1.

If one or more entry in the list is another list, then apply the cost definition recursively.

3.1.1 A list of words, no analysis:

1. Let's begin by defining the letter cost of a list of words, and assume *no morphological analysis*. Take, for example, the list of the six present tense forms of the Spanish verb *sing* (*canto*, etc.)

⁷“function” here means how it fits into the grammar of the language.

⁸If the list of the length is n , in a better world the cost of the structure of a list should really be $nl - 2n$, but we will not do that in this course so you don't have to look up logarithms to do the analysis. But that's why a list with only one member costs nothing.

(4)

1st Sg	canto
2nd Sg	cantas
3rd Sg	canta
1st Pl	cantamos
2nd Pl	cantáis
3rd Pl	cantan
$6 + 37$	$+ 12F = 6 + 185 + 12 = 203.$

There are 37 letters in the list of 6 words. We will assign a cost to each letter, and in general use the symbol λ for that cost; we will simply accept it as 5 bits.⁹ So our first definition of the cost of a list of words is (a) the number of *words* it contains (here, 6) plus (b) the number of letters it contains, times λ , and in this case that is 6, plus 37 times 5, or 191 bits, plus the number of grammatical features that are specified (times F). That makes a total of 203 bits, or just over 33 bits per word..

3.1.2 A simple analysis: Spanish verb

	Suffixes
Stems	1st Sg -o
cant	2nd Sg -as
llam	3rd Sg -a
42	1st Pl -amos
	2nd Pl -ais
	3rd Pl -an
	$6 + 13 + 12F = 83$
	Total: $2 + 42 + 83 = 127$

This is a list of two lists, so the total cost is equal to 2 plus the cost of each list. We calculate the cost of each in pretty much the same way we just did with the list of words. The cost of the list of stems is $2 + 8 \lambda = 42$ bits, and the cost of the second list, the affixes, is $6 + 13 \lambda + 12 = 6 + 65 + 12 = 83$ bits. The cost of the two together is the sum of these, or $2 + 42 + 83 = 127$ bits, or 10.6 bits per word (down from 33).

Implicit in this model is the notion that the words generated are formed from a choice of a particular stem, followed by one of the suffixes. This is a valid assumption only for a part of the data, so we have only begun to specify how words are built up. As our model becomes more articulated, we are capable of describing more data (and more complex data), but at the price of a slightly higher cost. In the next case, we consider how to measure the cost of describing multiple patterns in a language.

* * *

3.1.3 Latin noun

Let's consider another example that is similar to the one we just considered. Consider a single Latin noun:

⁹Because 2 is 32, which is approximately the size number of phonemes in the languages we are looking at.

	Meaning	friend
	Gender	masc.
Sg.	Nominative	amic̄us
	Genitive	amic̄i
	Dative	amic̄ō
	Accusative	amic̄um
	Ablative	amic̄ō
Pl.	Nominative	amic̄i
	Genitive	amic̄ōrum
	Dative	amic̄is
	Accusative	amic̄ōs
	Ablative	amic̄is

If we assume the stem is *amic̄*, then the suffixes are:

Sg.	Nominative	us
	Genitive	i
	Dative	ō
	Accusative	um
	Ablative	ō
Pl.	amic̄i	i
	Genitive	ōrum
	Dative	is
	Accusative	ōs
	Ablative	is

A natural model to consider is one in which there is a stem (and we have only one: *amic̄*) followed by one of the suffixes. Each suffix is associated with two features.

The complexity of the stem pattern is $4 = 20$.

The complexity of the suffix pattern is $10 + 18 + 20 = 10 + 90 + 20 = 120$ ¹⁰

The total pattern consists of a list with two members, each of which have complexity 20 and 120. The total is therefore $2 + 20 + 120 = 142$ bits, or 14.2 bits per word.

* * *

3.1.4 Worked exercise: Latin complexity

What is the complexity of the Latin data for ‘friend’ if we assume that there is no morphological analysis: just 10 different words in a paradigm:

Answer: $10 + (6 + 5 + 5 + 6 + 5 + 8 + 6 + 6 + 6) + 20 = 10 + 53 + 20 = 10 + 265 + 20 = 295$ or 29.5 bits per word. This is more than twice the complexity of the correct analysis that we identified above – hardly surprisingly.

¹⁰You see why it’s 20F, right? 10 entries, each marked for two syntactic features.

[End of January 16: II/2]

3.2 Spanish verb: More details

* * *

We elaborate the model a bit more, and consider data in which there is more than one pattern. In addition to the Spanish verbal data above, we add two additional verbs:

	eat	fear
1st sg.	como	temo
2nd sg.	comes	temes
3rd sg.	come	teme
1st pl.	comemos	tememos
2nd pl.	comeis	temeis
3rd pl.	comen	temen

With an analysis for the Spanish data seen so far:

	Suffixes	
Stems	1st Sg	-o
cant	2nd Sg	-as
llam	3rd Sg	-a
42	1st Pl	-amos
	2nd Pl	-ais
	3rd Pl	-an
	83	
	Total = 2 + 42 + 83 = 127	
	Suffixes	
Stems	1st Sg	-o
com	2nd Sg	-es
tem	3rd Sg	-e
32	1st Pl	-emos
	2nd Pl	-eis
	3rd Pl	-en
	83	
	Total = 2 + 32 + 83 = 117	

This analysis is itself a list of two patterns. So its total cost is 2 plus the cost of each individual pattern (first and second conjugations, respectively, with two stems in each).

The total complexity of this analysis is measured:

1. Number of patterns: 2

2. Cost of first pattern: $2 + [2 + (4 + 4)] + [6 + 13 + 12F] = 2 + [2 + 40] + [6 + 65 + 12] = 127$
3. Cost of second pattern: $2 + [2 + (3 + 3)] + [6 + 13 + 12F] = 2 + [2 + 30] + [6 + 65 + 12] = 117$
4. Total: $2 + 127 + 117 = 246$

* * *

3.2.1 Stem allomorphy

We elaborate the model one more step, as we consider the following additional data:

Sg.	
1st	empiezo
2nd	empiezas
3rd	empieza
1st pl.	empezamos
2nd pl.	empezais
3rd pl.	empiezan

We analyze the same set of suffixes, but there is not a consistent (single) stem:

Sg.	
1st	empiez-o
2nd	empiez-as
3rd	empiez-a
1st pl.	empez-amos
2nd pl.	empez-ais
3rd pl.	empiez-an

At the moment, we do not have a better way to formulate the analysis than this:

	Suffixes
Stems	1st Sg -o
empiez	2nd Sg -as
	3rd Sg -a
	3rd Pl -an
	Suffixes
Stems	1st Pl -emos
empez	2nd Pl -eis

(Exercise: calculate the complexity of this analysis of six words. It will be 2 plus the sum of two separate patterns.)

It is clear that we are paying for more complexity than we should be, given the amount of patterning, or redundancy, we find here. The most important thing is that as far as the suffixal pattern goes, this is not a new pattern; we need to re-use the old one, and find a way to talk about the fact that there are two different stems involved.

The list of stems now contains some stems which are specifically marked for person and number, which they were not before. The cost of such entries will be measured just as we have done up to now: we include the cost of the features, as we did with the suffixes.

Sg. or (3rd pl.)	empiez
Pl. (1st or 2nd)	empez

What is the complexity of the entire 1st conjugation (-ar) set of verbs? This is what we have so far:

Stems	Suffixes
cant	1st Sg -o
llam	2nd Sg -as
empiez Sg. or 3rd.pl.	3rd Sg -a
empez Pl. (1st or 2nd)	1st Pl -amos
100	2nd Pl -áis
	3rd Pl -an
	83 Total: $2 + 100 + 83 = 185$.

The stem part of the pattern costs: $4 + 18 + 6F = 100$.

The suffix part of the pattern costs: $6 + 13 + 12F = 83$.

The entire pattern is therefore: $2 + 100 + 83 = 185$.

3.2.2 Present tense of three types

T:1	sing	call
infinitive	cantar	llamar
1st Sg	canto	llamo
2nd Sg	cantas	llamas
3rd Sg	canta	llamo
1st Pl	cantamos	llamamos
2nd Pl	cantáis	llamáis
3rd Pl	cantan	llaman

T:2	eat	fear
infinitive	comer	temer
1st sg.	como	temo
2nd sg.	comes	temes
3rd sg.	come	teme
1st pl.	comemos	tememos
2nd pl.	coméis	teméis
3rd pl.	comen	temen

T:3	open	write	live
infinitive	abrir	escribir	vivir
1st Sg	abro	escribo	vivo
2nd Sg	abres	escribes	vives
3rd Sg	abre	escribe	vive
1st Pl	abrimos	escribimos	vivimos
2nd Pl	abris	escribís	vivís
3rd Pl	abren	escriben	viven

$$oot \left\{ \begin{array}{c} \textit{theme-vowel} \\ a \\ e \\ i \end{array} \right\} t$$

root	morpheme1 (theme vowel)	aspect	suffix
a	T:1 and (infinitive or (present and (plural or 1st or 2nd)))	b past and imperfect present or perfect	o 1st sg s 2nd sg 3rd sg
e	(T:2 and infinitive) or ((T:1 or T:2) and present and (plural or 1st or 2nd))		mos 1st pl. in (T:1 or T:2) and 2nd pl.
i	T:3 and infinitive (1st and sg) and infinitive		n T:1 and 2nd pl. n 3rd pl.
4 + 4 + 19F		2 + 2 + 4F	6 + 9 + 17F

Total cost: $3 + 43 + 16 + 78 = 140$.

Looking at the template above, it is hard to resist the wish that we could invoke a simple phonological rule to account for the absence of the theme vowel in some places: we could save quite a few morphosyntactic features (10, at the least). If we could say that the theme vowel is null when immediately before the 1st sg subject marker, then we could write this:

root	morpheme1 (theme vowel)	aspect	suffix	
	a T:1	b imperfect	o	1st sg
	e T:2	present or perfect	s	2nd sg
	i T:3			3rd sg
			mos	1st pl.
			in	(T:1 or T:2) and 2nd pl.
			n	T:3 and 2nd pl.
			n	3rd pl.
3 + 3 + 3F		2 + 2 + 4F	6 + 9 + 17 F	

Total cost: $3 + 21 + 16 + 78 = 118$. $\frac{118}{140} \approx 0.84$.

But because our purposes are pedagogical, we will continue to do all our analysis in a morphological way—in part, so we can appreciate how much better the world is (and how much better morphology is) when it is aided by phonology.

3.2.3 Two past tenses: perfect, imperfect

3.2.3.1 First conjugation: cantar Let's first look at the first conjugation (cantar) in the present and the two past tenses.

T:1	sing		
	present	imperfect	perfect
1st Sg	canto	cantaba	canté
2nd Sg	cantas	cantabas	cantaste
3rd Sg	canta	cantaba	cantó
1st Pl	cantamos	cantábamos	cantamos
2nd Pl	cantais	cantabais	cantasteis
3rd Pl	cantan	cantaban	cantaron

The imperfect form here is an example of what the Item and arrangement view takes to be the right form of morphology: there is a single phoneme *-b-* which appears after the stem and the theme vowel, and before the person-number suffix. The perfect shows a theme vowel in 4 of the 6 forms, followed by a suffix which is specified by the features of person, number, tense, and aspect. There is no particularly appealing way to express the (morphophonological) generalization that the theme vowel appears in the past forms, except that in the past perfect, it does not appear in the 1st and 3rd sg.

$$oot \left\{ \begin{array}{c} \textit{theme-vowel} \\ a \\ e \\ i \end{array} \right\} \quad t \quad t$$

The subject agreement suffixes are different from what we saw in the present tense:

TENSE: PAST		
ASPECT: PERFECT		
	Sg	Pl
1	é	mos
2	ste	steis
3	ó	ron

If we express together the person number suffixes for the three tense/aspect patterns we have seen for the first conjugation, this is what we find:

Subject-marker						
TENSE:	PRESENT		PAST		PAST	
ASPECT:			IMPERFECT		PERFECT	
	Sg	Pl	Sg	Pl	Sg	Pl
1	o	mos	a	mos	é	mos
2	s	is	as	is	ste	steis
3		n	a	an	ó	ron

What is the cost of this? There are three patterns; each has six forms. Each of the 18 forms is associated with 2 person number features; the present is marked for tense, and the other two are marked for both tense and aspect. The total cost is $3 + [6 + 18F + 9] + [6 + 18F + 11] + [6 + 18F + 16] = 3 + 69 + 79 + 104 = 255$.

We could organize this with less complexity in this way:

o	Person:1st sg and Tense:Present
a	Person:1st sg and Tense:Past and Aspect:Imperfect
e	Person:1st sg and Tense:Past and Aspect:Perfect
s	Person:2nd sg and Tense:Present
as	Person:2nd sg and Tense:Past and Aspect:Imperfect
ste	Person:2nd sg and Tense:Past and Aspect:Perfect
	Person:3rd sg and Tense:Present
a	Person:3rd sg and Tense:Past and Aspect:Imperfect
o	Person:3rd sg. and Tense:Past and Aspect:Perfect
mos	Person:1st pl.
is	Person:2nd pl and (Tense:Present or Aspect:Imperfect)
steis	Person:2nd pl and Tense:Past and Aspect:Perfect
n	Person:3rd pl.
an	Person:3rd pl and Tense:Past and Aspect:Imperfect
ron	Person:3rd pl and Tense:Past and Aspect:Perfect

$$15 + 28 + 51F = 206.$$

We could make this just a slight bit simpler if we set up an aspect marker -st-. Here is a summary of what we need to say about 1st conjugation (-ar) verbs, in the three cases we have looked at.

root	theme vowel	aspect	subject-agreement
a	T:1 and (infinitive or (present and (plural or 1st or 2nd)))	present or perfect	o Person:1st sg and Tense:Present
		b Aspect:Imperfect	a Person:1st sg and Tense:Past and Aspect:Imperf
		st Person:2nd sg and Aspect:Perfect	e Person:1st sg and Tense:Past and Aspect:Perfect
			s Person:2nd sg and Tense:Present
			as Person:2nd sg and Tense:Past and Aspect:Imperf
			ste Person:2nd sg and Tense:Past and Aspect:Perfect
			Person:3rd sg and Tense:Present
			a Person:3rd sg and Tense:Past and Aspect:Imperf
			o Person:3rd sg. and Tense:Past and Aspect:Perfect
			mos Person:1st pl.
			is Person:2nd pl and (Tense:Present or Aspect:Imperf
			steis Person:2nd pl and Tense:Past and Aspect:Perfect
			n Person:3rd pl.
			an Person:3rd pl and Tense:Past and Aspect:Imperf
			ron Person:3rd pl and Tense:Past and Aspect:Perfect
+ 6F		3 + 4 + 6F	256 (see above)

Total = 4 + 11 + 29 + 256 = 300.

3.2.4 New section

* * *

We can combine the analyses of the two types of Spanish stems by introducing a feature which will take on different values for the two conjugation types. We will use an arbitrary name, and our convention for arbitrary names will be plus a number: in this case, 1, since it is the first feature that we need to introduce that does not have an obvious name. This feature will take on two values, which we will call (again, arbitrarily) “1” and “2”.

We (linguists) are sometimes sloppy, and fail to make clear the distinction between a feature and a feature-value. I don’t mind being sloppy in this way as long as we know what we are doing, and if something is made unclear because of this, we will need to be careful and clear.

If we wanted to write it in a way that was clearer for human beings, then we could write *first-conjugation* or *ar-verb* instead of *F1:1*, and *second-conjugation* instead of *F1:2*. The part before the colon is the name of the features, and the part after the colon is the value that the feature takes on.

Stems		Suffixes		
cant	F1:1	1st Sg	-o	
llam	F1:1	2nd Sg	F1:1	-as
empiez	F1:1 Sg. or 3rd.pl.	2nd Sg	F1:22	-es
empez	F1:1 Pl. (1st or 2nd)	3rd Sg	F1:1	-a
com	F1:2	3rd Sg	F1:2	-e
tem	F1:2	1st Pl	F1:1	-amos
		1st Pl	F1:2	-emos
		2nd Pl	F1:1	-ais
		2nd Pl	F1:2	-eis
		3rd Pl	F1:1	-an
		3rd Pl	F1:2	-en
143		168 Total: 2 + 143 + 168 = 313		

Stem pattern costs: $6 + 25 + 12F = 143$.

Suffix pattern costs: $11 + 25 + 32F = 168$.

Total cost: $2 + 143 + 168 = 313$.

How does this compare to the total cost of the prior analysis?

3.2.5 Theme vowel analysis

Now we may consider an analysis with three morphemes in most of the verbs:

Stems		Suffixes	
cant	F1	1st Sg	o
llam	F1	2nd Sg	s
empiez	F1 Sg. or 3rd.pl.	3rd Sg	
empez	F1 Pl. (1st or 2nd)	1st Pl	mos
com	F2	2nd Pl	is
tem	F2	3rd Pl	n
143		27	
		Total: 3 + 143 + 19 + 27 = 192	

Total = $3 + 143$ [stems] + $19 + 27$ [suffix] = 192.

Q1: How much of an improvement does this give us?

Q2: Where does the improvement come from?

Q3: Are the analyses for just the -ar verbs better if the theme vowel is analyzed as a separate morpheme?

Stems	Theme vowel	Suffixes	Total	
42		83	125	-ar verbs, regular
32		83	117	-er verbs, regular
100		83	185	-ar verbs, both reg. and irreg.
			246	only regular stems, -ar and -er
143		168	313	all three groups
143	19	27	192	theme vowel analysis

3.3 Worked problem: Tetelcingo Aztec

From Merrifield, page 2. Consider the following data with glosses.

nkwika	I sing	tčuka	you cry
tkwika	You sing	tčukataya	you were crying
tikonik	You drank	tikonitka	you are drinking
nkonitka	I am drinking	nkwikataya	I was singing
tkwikas	You will sing	nkonis	I will drink
nčukatka	I am crying	nčukak	I cried

We rewrite the data in a clearer fashion:

	sing	cry	drink
1st sg present	nkwika		
2nd sg present	tkwika	tčuka	
1st sg present continuous		nčukatka	nkonitka
2nd sg present continuous			tikonitka
1st sg past		nčukak	
2nd sg past			tikonik
1st sg past continuous	nkwikataya		
2nd sg past continuous		tčukataya	
1st sg future			nkonis
2nd sg future	tkwikas		

It is now easy to divide the words into morphemes:

	sing	cry	drink
1st sg present	n-kwika		
2nd sg present	t-kwika	t-tčuka	
1st sg present continuous		n-čuka-tka	n-koni-tka
2nd sg present continuous			t-koni-tka
1st sg past		n-čuka-k	
2nd sg past			t-koni-k
1st sg past continuous	n-kwika-taya		
2nd sg past continuous		t-tčuka-taya	
1st sg future			n-koni-s
2nd sg future	t-kwika-s		

And we can come up with the following pattern:

subject		root	tense/aspect
nt	1st sg.	kwika	-tika present continuous
ti	2nd sg.	čuka	-k past
		koni	-taya past continuous
			-s future

$$2 + 4 + 4 = 2 + 20 + 4 = 26 \quad 3 + 13 = 3 + 65 = 68.$$

The complexity of the subject marker pattern is $2 + 4 + 4 = 2 + 20 + 4 = 26$.

The complexity of the root pattern is $3 + 13 = 3 + 65 = 68$.

The complexity of the tense/aspect pattern = $4 + 10 + 6 = 4 + 50 + 6 = 60$

The complexity of this entire pattern equals $3 + 26 + 68 + 60 = 157$.

3.4 Issues in segmentation

There are many clear cases of words that we analyze into stems and affixes. Here are some examples.

1. Null or zero morphemes in inflectional paradigms. Singular suffix in English, verbal suffix in English.
2. Conversion: for example, when a noun is used as a verb: to skype someone.
3. *-ment*: a suffix in *nt nt*, and probably in *o n nt*. Is it a suffix in *nt*, *nt*, or *t t nt*? Cases when we know we have a certain affix, but we are not sure if it is present in a particular word.
4. Cases where we are sure there is an affix, but we are not sure where to make the cut between stem and suffix. *n*, *n*. Maybe this is phonology?
5. ‘Ablaut’ cases, or a generalization of that. *Stand/stood*; *begin/began/begun*; *sing/sang/sung*. There are two (or more) strings where the difference is not at the edge of the string.
6. Cases where we would define the stem of a word in two different ways, if we considered different parts of the words ‘paradigm.’
7. Cases where there are too few examples, even though the semantics seems plausible:

	clitic	prosodically strong	poss (sg)	poss (pl.)	strong poss.
m-	me [mə]	moi	mon	mes	le mien
t-	te [tə]	toi	ton	tes	le tien
s-	se [sə]	soi	son	ses	le sien
n-	nous [nu]	nous	notre	nos	le nôtre
v-	vous [vu]	vous	votre	vos	le vôtre

8. Cases where we have two morphemes, but we are not sure if one is an affix. Perhaps both are stems—in which case we have a *compound*.

(a) -like, -ful(l). They were really a handful. A handful of pennies.

9. Tonal affixes.

10. Stress differences in related words. English noun/verb pairs.
11. productivity: Interesting French example: Le commissariat bourdonne comme un lundi, c'est-à-dire en sourdine. Les plantons plantonnent, les gardiens gardiennent, et les enquêteurs trieront leurs dossiers une fois le journal lu. In *French Tabloïds*, by Jean-Hugues Oppel.

4 Some terms in morphology

1. Exponence: we speak of ‘exponence’ when we want to say that a certain morphosyntactic feature is realized by a particular morpheme (or in some phonologically overt way).
2. Humboldt’s classic division of systems into **agglutinative**, **inflectional**, **isolating**, and **incorporating**.

Agglutinative: The term *agglutinative* is used to describe a morphological system in which there is little or no (morpho)phonology at morpheme boundaries (and it is therefore easy to identify affixes), and in which each morpheme corresponds to a single morphosyntactic feature specification. If we also expect a morpheme to have a single allomorph (as we typically do in agglutinative systems), then we may have to abstract away from effects of vowel harmony. The term *fusional* has been used to describe cases where morphophonological processes are active at morpheme boundaries, hence the location of morpheme boundary is not at all obvious.

4.1 Syncretism

Syncretism is the name we give to instances where there is a strong connection between two cells of an inflectional paradigm.

Example 1, from Andrew Spencer: Russian noun ‘lampa’ Nominative plural and accusative plural are consistently identical, across all the different affixes we might find in a noun’s inflectional morphology.

Case	Singular	Plural
nominative	lamp a	lamp y
accusative	lamp u	lamp y
genitive	lamp y	lamp
dative	lamp e	lamp am
instrumental	lamp oj	lamp ami
prepositional	lamp e	lamp ax

More data, from Gereon Müller “A Distributed morphology approach to syncretism in Russian Noun inflection”

Inflection Class I, Singular and masculine						
	zavod	factory	student	student	zitel	week
nom sg	zavod-		student-		nedel-ja	mužčin-a
acc sg	zavod-		student-u		nedel-ju	mužčin-u
dat sg	zavod-e		učitel’nic-e		student	mužčin-e
gen sg	zavod-y		učitel’nic-y		student	mužčin-y
instr sg	zavod-oj(u)		učitel’nic-ej(u)		nedel-ej(j)	mužčin-oj(u)
loc sg	zavod-e		učitel’nic-e		nedel-e	mužčin-e

Inflection Class II, Singular and [feminine or masculine]				
	komnat room	učitel'nic teacher	nedel' week	mužčin man
nom sg	komnat-a	učitel'nic-a	nedel-ja	mužčin-a
acc sg	komnat-u	učitel'nic-u	nedel-ju	mužčin-u
dat sg	komnat-e	učitel'nic-e	nedel-e	mužčin-e
gen sg	komnat-y	učitel'nic-y	nedel-i	mužčin-y
instr sg	komnat-oj(u)	učitel'nic-ej(u)	nedel-ej(j)	mužčin-oj(u)
loc sg	komnat-e	učitel'nic-e	nedel-e	mužčin-e

Inflection Class III, Singular and feminine			
	tetrad' notebook	myf' mouse	doč' daughter
nom sg	tetrad'-	myf'-	doč'-
acc sg	tetrad'-	myf'-	doč'-
dat sg	tetrad-i	myf-i	doč-er-i
gen sg	tetrad-i	myf-i	doč-er-i
instr sg	tetrad'-ju	myf'-j(u)	doč-er'-ju
loc sg	tetrad-i	myf-i	doč-er-i

	mest 'place'	jablok 'apple'	sufčestv creature	pol' field
nom/sg	mest-o	jablok-o	sufčestv-o	pol-e
acc/sg	mest-o	jablok-o	sufčestv-o	pol-e
dat/sg	mest-u	jablok-u	sufčestv-u	pol-ju
gen/sg	mest-a	jablok-a	sufčestv-a	pol-ja
inst/sg	mest-om	jablok-om	sufčestv-om	pol-em
loc/sg	mest-e	jablok-e	sufčestv-e	pol-e

Singular					Plural				
	I masc	II fem, masc	III fem	IV neuter	I masc	II fem, masc	III fem	IV neuter	
nom		a		o	nom	y	y	i	a
acc	/a	u		o	acc	y	y	i	a
dat	u	e	i	u	dat	am	am	jam	am
gen	a	i	i	a	gen	ov		ej	
inst	om	oj	ju	om	inst	ami	ami	jami	ami
loc	e	e	i	e	loc	ax	ax	jax	ax

4.2 Distinguishing inflectional and derivational morphology

1.

Two main areas of inflectional morphology: agreement and government. Also: *n nt* properties (Anderson 1985 the source of the term?). Good example: tense in English.

Subject verb agreement.

Object verb agreement (e.g., Bantu?)

Hungarian: verbs agree with direct object for definiteness.

Gender and number on nouns and adjectives in French.

More complex case: agreement of the past participle in French when its direct object is wh-moved or cliticized:

la remarque que j'ai fait-e

There are rough and ready generalizations about which features play a role in agreement across languages.

Government of NP case by verbs and prepositions. Example: German: dative, accusative, and an occasional odd archaic genitive.

Subcase: Nominative/accusative versus ergative/absolutive case marking.

Government of clausal mood by verb or adverb: French subjunctive.

4.3 French adjectives

French adjectives illustrate subtractive morphology: the masculine form is often realized by a deletion of the final consonant of the stem. See the table below (Table 6).

4.4 Latin nouns

From Tore Jansen A Natural History of Latin. I've added vowel length, dropped stress marking.

Third declension nouns show other patterns in the nominative singular:

Declension	3	3	3
Meaning	orator	nation	city
Gender	masc.	masc.	fem.
Nominative	ōrātōr	nātio	urbs
Genitive	ōrātōris	nātiōnis	urbis
Dative	ōrātōri	nātiōnī	urbī
Accusative	ōrātōrem	nātiōnem	urbem
Ablative	ōrātōre	nātiōne	urbe
Nominative	ōrātōrēs	nātiōnēs	urbēs
Genitive	ōrātōrum	nātiōnum	urbium
Dative	ōrātōribus	nātiōnibus	urbibus
Accusative	ōrātōrēs	nātiōnēs	urbēs
Ablative	ōrātōribus	nātiōnibus	urbibus
Declension	2	3	4
Meaning	temple	sea	horn
Gender	neuter	neuter	neuter
Nominative	templum	mare	cornu
Genitive	templi	maris	cornus
Dative	templo	mari	córnuī
Accusative	templo	mari	cornu
Ablative	templo	mari	cornu
Nominative	templa	máre	córnuā
Genitive	templórum	márium	córnuum
Dative	templum	máre	córniibus
Accusative	templum	máre	córnuā
Ablative	templum	máre	córniibus

	femina	feminae	feminae	feminam	femina
femina		\bar{e}	\bar{e}	\bar{m}	
feminae	\underline{e}			\underline{m}	\underline{e}
feminae	\underline{e}			\underline{m}	\underline{e}
feminam	\underline{m}	\underline{m}	\underline{m}		\underline{m}
femina		\bar{e}	\bar{e}	\bar{m}	

1st declension singular: first differences

2nd declension singular: first differences

	amicus	amici	amico	amicum	amico
amicus		\underline{us}	\underline{us}	\underline{s}	\underline{us}
amici	\underline{i}	\underline{o}	\underline{i}	\underline{m}	\underline{o}
amico	\underline{o}	\underline{i}	\underline{o}	\underline{um}	\underline{o}
amicum	\underline{m}	\underline{um}	\underline{um}		\underline{um}
amico	\underline{s}	\underline{o}	\underline{o}	\underline{um}	\underline{o}
amico	\underline{us}	\underline{i}		\underline{um}	

4.5 Latin adjectives

Case	Singular			Plural		
	Masculine	Feminine	Neuter	Masculine	Feminine	Neuter
nominative	clārus	clāra	clārum	clārī	clārae	clāra
genitive	clārī	clārae	clārī	clārōrum	clārārum	clārōrum
dative	clārō	clārae	clārō	clārīs	clārīs	clārīs
accusative	clārum	clāram	clārum	clārōs	clārās	clāra
ablative	clārō	clārā	clārō	clārīs	clārīs	clārīs
vocative	clāre	clāra	clārum	clārī	clārae	clāra

4.6 Latin verbs

Matthews 1972. Mark Aronoff, Morphology by itself. 1994.

Theme vowels in Latin: these are neither derivational nor inflectional, in the way we normally use those terms; but they are unquestionably part of the inflectional system of the verb.

Conjugation	theme vowel	present active infinitive	gloss
1st	\bar{a}	amāre	love
2nd	\bar{e}	dēlēre	destroy
3rd	e	legere	pick
	i	capere	take
		ferre	carry
4th	\bar{i}	audīre	hear

The perfect participle is formed by the suffix -t- added to the theme vowel. In some cases, a different consonant is used (-s-, for example); in others, a different stem is used.

The future active participle is based on the (perfect) passive participle: it itself is marked by the suffix -ūr-, and even if the perfect passive participle is not produced simply from the root plus theme vowel, the future active participle uses the form of the perfect passive participle. Aronoff says that Matthews uses the

term *t* to refer to the way in which the *o*, but not the *n n*, of the future active participle relates to that of the perfect participle.

This table from Aronoff:

Present act. inf	Perfect part.	Future part.	Gloss
laudāre	laudāt-	laudātūr	praise
monēre	monit-	monitūr	warn
ducere	duct-	ductūr	lead
audire	audit-	auditūr	hear
capere	capt	captūr-	take
vehere	vect	vectūr-	carry
haerere	haes-	haesūr-	stick
premere	press-	pressūr -	press
ferre	lat	latūr-	bear
loqui	locut	locutūr -	speak
experiri	expert	expertūr	try
mori	mortu	moritūr	die
seeā	section	secāt	cut

Aronoff notes that there are some verbs with a future participle, but no perfect participle (since they are intransitive):

caleō	calitūr-	burn, be hot
doleō	dolitūr-	suffer pain
iaceō	iactūr-	lie
recidō	racāsūr-	fall back
ēsuriō	ēsurituūr-	be hungry

How can this be?

4.7 Latvian

Two genders.

Syncretism: instrumental is linked to accusative in singular, and to the dative in the plural. [check source on this] Masculine declensions

	1st decl.		2nd decl.		3rd decl.	
	man, husband		shelf		market, bazaar	
	Sing.	Plur.	Sing.	Plur.	Sing.	Plur.
Nom.	vīrs	vīri	skapis	skapji	tirgus	tirgi
Gen.	vīra	vīru	skapja	skapju	tirgus	tirgu
Dat.	vīram	vīriem	skapim	skapjiem	tirgum	tirgiem
Acc.	vīru	vīrus	skapi	skapjus	tirgu	tirgus
Ins.	vīru	vīriem	skapi	skapjiem	tirgu	tirgiem
Loc.	vīrā	vīros	skapī	skapjos	tirgū	tirgos
Voc.	vīr	vīri	skapi	skapji	tirgu	tirgi

Note palatalization with second declension; there are important details here. Some second declension masculines have -s, like the nominative, in the genitive.

	4th decl.		5th decl.		6th decl.	
	woman, wife		river		night	
	Sing.	Plur.	Sing.	Plur.	Sing.	Plur.
Nom.	sieva	sievas	upe	upes	nakts	naktis
Gen.	sievas	sievu	upes	upju	nakts	nakŕu
Dat.	sievai	sievām	upei	upēm	naktij	naktīm
Acc.	sievu	sievas	upi	upes	nakti	naktis
Ins.	sievu	sievām	upi	upēm	nakti	naktīm
Loc.	sievā	sievās	upē	upēs	nakti	naktis
Voc.	siev	sievas	upe	upes	nakts	naktis

Palatalization here also has exceptions, including among borrowings. 4th and 5th declension includes some masculines, which exceptionally have a different dative singular: -am in the 4th, -em in the 5th.

4.8 Zulu: noun class system

Zulu has a system of about 14 noun classes — I say ‘about’ because there are several natural ways to count the number, and we arrive at different numbers depending on how we count.

The take-home point is that behind a lot of Zulu syntax and morphology is a category (or a variable, one might say) that takes on a certain value for most words in a Zulu sentence, though exactly how a given feature is realized (phonologically) can vary quite a bit across the different lexical categories: there are, in fact, seven different ways that a noun class will be realized, as we will see. In Table 1, we see a few nouns that have both a singular and plural, and some nouns that do not have a plural. What we *call* plural, though, is not a natural category in Zulu grammar: there is nothing that all of the singulars on the left side of the table share, nor something that all the nouns on the right share, except in terms of meaning (and it is a meaning that plays no role in Zulu grammar).

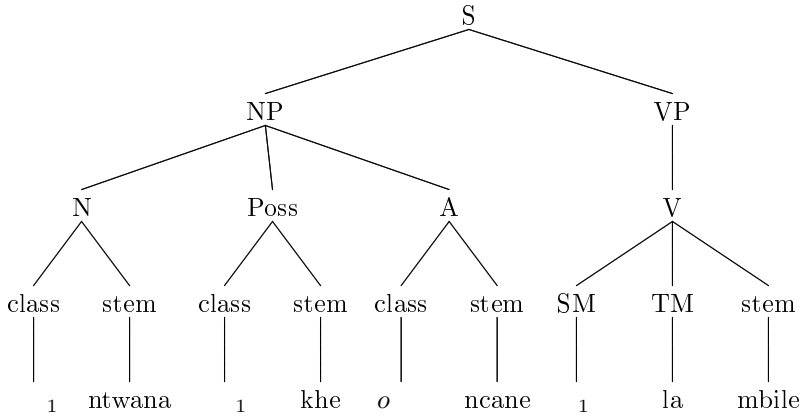
As a first approximation, we may say that all nouns obligatorily bear a noun class marker, and each stem (if it is a stem that has both a singular and a plural form) is associated with one of five pairs of noun classes — the first five rows of Table 2. Some nouns do not have a pair of classes, corresponding to a singular and a plural; abstractions and liquids are the central cases. These stems are associated with a single noun class, often class 5 or class 11. Infinitives are all in class 15, and are built from verb stems.

In Table 3, we see a set of typical stems belonging to the pair of classes (class 1, class 2). We see several things: these words all refer to humans, and class 1 is realized either as *umu-* (if the stem is monosyllabic) or as *um-* (if the stem is polysyllabic). Class 2 is realized as a prefix *aba-*. There is a subgroup of them (at the end) that have a class 2 prefix of *abe* rather than *aba*.

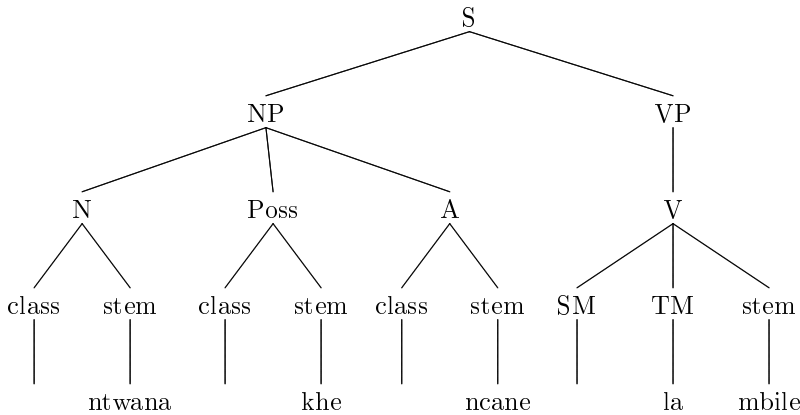
There is also a class of deverbal agentive nouns, illustrated in Table 4. You will see that their final vowel is - in all cases.

In addition to being marked as a noun prefix, the case of a noun is realized on words that modify it: for example, possessives and adjectives are marked with a prefix that reflects the noun class of the noun that

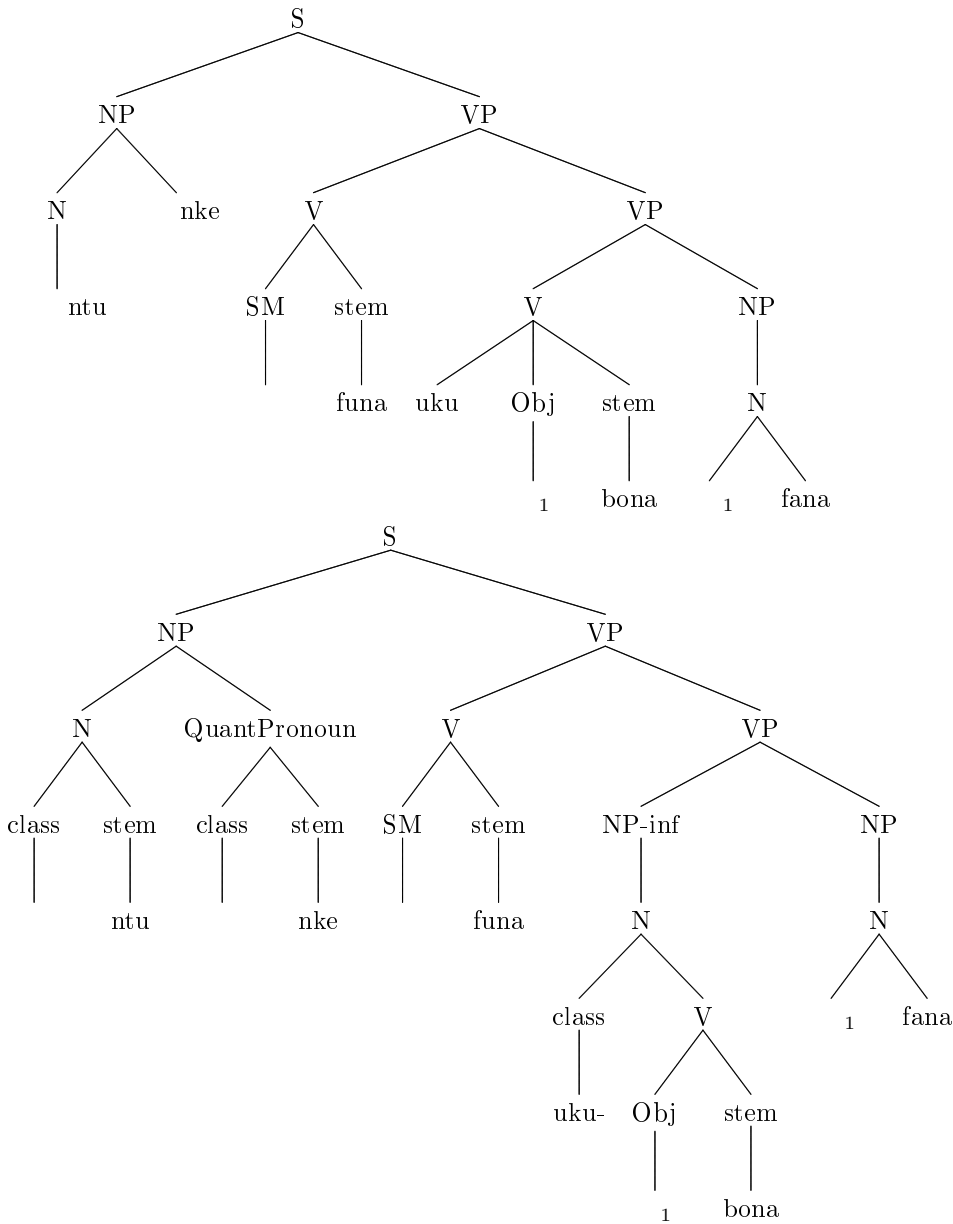
they modify. This is illustrated in examples (1) through (5). The difference between *Um-ntwana wa-khe om-ncane* (1-child 1-his 1-small) and *Aba-ntwana ba-khe aba-ncane* (2-child 2-his 2-small) is the same as the difference between his small child and his small children: the difference in the number of children is reflected in the difference between class 1 and class 2, and this difference is marked on all three words that form the noun phrase.



- (5) *Um-ntwana wa-khe om-ncane u-la-mbile*
 1-child t_1 -his t_1 -small t_1 -hungers
 His small child is hungry.



- (6) *Aba-ntwana ba-khe aba-ncane ba-la-mbile*
 2-child t -his t -small t -hunger
 His small children are hungry.



(7) *Aba-ntu bo-nke ba-funa uku-m-bona um-fana.*
 2-People *t* -all *t* -want to- 1-see 1-boy.

All the people want to see the boy.

(8) *Um-fundisi we-thu o-hlakaniphile u-ya-ba-fundisa aba-ntwana aba-ningi.*
 1-teacher 1-our he-wise 1-focus-*t* -teach 2-children 2-many

Our wise teacher teaches the many children.

(9) *um-khuhlane wa-khe omu-bi u-philile manje*
 3-fever *t* -his *t* -bad *t* -finished now.

His bad fever is finished now.

- (10) *ili-tshe la-mi eli-hle eli-mhlophe li-ya-m-siza u-makhi o-hlakaniphile*
 5-stone 5-my 5-nice 5-white 5-is-him-helping builder he-skillful
 My nice white stone is helping the skillful builder.
- (11) *isi-thsa sa-mi esi-hle esi-mhlophe si-ya-ko-ndla uku-dla oku-mnandi*
 7-dish 7-my 7-nice 7-white 7-is-15-keeping 15-food 15-pleasant.
 My nice white dish is keeping the pleasant food.
- (12) *im-buzi ya-mi en-hle em-hlophe i-ya-yi-funa imi-fino eluhlaza*
 9-goat 9-my 9-nice 9-white 9-is-4-wanting 4-vegetables 4-green
 My nice white goat is wanting the green vegetables.
- (13) *uku-dla kwa-mi oku-hle oku-mtoti ku-ya-si-siza thi-na so-nke*
 15-food 15-my 15-nice 15-sweet 15-is-us-helping us all
 My nice sweet food is helping us all

4.8.1 Zulu nominal information

Class	Noun prefix	Subject prefix	Object marker	Adjectival concord:	= a + Noun Prefix	Relative	= a + Subject Marker	Enumerative	Pre-Nguni: no 1a/2a; no -n- in class 9/10.
1 2	mu	ba	u	ba	mu	ba	omu	aba	o
1a 2a	u	o	u	ba	mu	ba	omu	aba	o
3 4	mu	mi	u	i	wu	yi	omu	emi	o
5 6	(l)i	ma	li	a	li	wa	eli	ama	eli
7 8	si	zi	si	zi	si	zi	esi	ezin	esi
9 10	in	izin	i	zi	yi	zi	en	ezin	e
11	(lu)	lu	lu	olu	olu	lu			
14	bu	bu	bu	obu	obu	bu			
15	ku	ku	ku	oku	oku	ku			

4.9 French verbs

All except two verbs in French are assigned an inflectional class. There are three large families among which the verbs are assigned; these are widely known by the suffix that appears on the infinitive: the -er verbs, the -ir verbs, and the -re verbs. (The two verbs which are entirely defective are *voici* and *voilà*.)

There is a set of features, or dimensions, that organizes this verbal whole: the feature of person (1st, 2nd, 3rd), number (sg, pl), mood (indicative, subjunctive, imperative), tense (present, past, future) and aspect (perfect, imperfect).

Tense	Mood	Voice	Subject person	Subject number
Present	Indicative	active	1st	singular
Past	Subjunctive	passive participle	2nd	plural
Future			3rd	

Indicative mood	
Present tense	
Singular subject	Plural subject
chante	chantons
chantes	chantez
cante	chantent

4.10 Hungarian

http://wiki.langwiki.info/Hungarian:Noun_Declension

singular				
	ember	dög	h'az	állat
my	emberem	dögöm	h'azam	állatom
your (sg)	embered	dögöd	h'azad	állatod
his/her	embere	döge	h'aza	állata
our	emberünk	dögünk	h'azunk	állatunk
your (pl)	emberetek	dögötek	h'azatok	állatotok
their	emberük	dögük	h'azuk	állatuk
plural				
	ember	dög	h'az	állat
my	embereim	dögeim	h'azaim	állataim
your (sg)	embereid	dögeid	h'azaid	állataid
his/her	emberei	dögei	h'azai	állatai
our	embereink	dögeink	h'azaink	állataink
your (pl)	embereitek	dögeitek	h'azaitok	állataitok
their	embereik	dögeik	h'azaik	állataik

5 Derivational morphology

Derivational morphology deals primarily with the relationship between separate lexemes, typically in different parts of speech, and typically in a way that is both semantically irregular, and limited in its range of application.

There is a significant portion of (what is typically viewed as) derivational morphology that does not fall naturally under that description – these are cases where words are modified in their outward form with no change in their grammatical function. The clearest case of this is the case of “clippings”, where words are shortened — advertisement becomes ad, omnibus becomes bus, and so on. The creation of nicknames is similar, as is the case of language games.

Russian, Spanish, English nicknames. Many similarities in these processes, despite many similarities.

As a consequence, a derivationally derived form can always be replaced by a non-derived form – something that is rarely the case for inflectionally complex forms.

How many derivational affixes does English have? ...

6 Inflectional versus Derivational morphology

1. Stump 1998, p.15:

Two expressions related by principles of derivation may differ in their lexical meaning, their part-of-speech membership, or both; but two expressions belonging to the same inflectional paradigm will share both their lexical meaning and their part of speech—that is, any differences in their grammatical behavior will stem purely from the morphosyntactic properties that distinguish the cells of a paradigm.

This raises the question: what are the parts of speech of a language that this refers to? How fine-grained is it? In particular, can the members of this paradigm be of distinct parts of speech?

Problem: Stump: ‘a verbal lexeme’s past participle is traditionally seen as an integral part of its paradigm, yet past participles are, in many languages, unmistakably adjectival in character.’ (15).

2. (Stump 1998 p. 15; this is not his wording) Syntax may allow for governing of choice of items in a paradigm, but syntax never governs or requires a particular kind of derivational morphology.

S. Anderson: ‘Inflectional morphology is what is relevant to the syntax.’ (Stump 1998 cites Anderson 1982 p. 587).

Problem: The difference between (at least some) adjectives and (their corresponding) adverbs certainly could be analyzed as *t* an example of what this principle rules out (see for example Emonds’ treatment of adverbs in his thesis, I think).

3. (Stump 1998 p. 16, not his wording) Inflectional morphology is maximally productive; derivational morphology may be very productive, but it typically is sporadic and only modestly productive.

Problems: Defective inflectional paradigms.

Difficulty of defining productivity.

4. Stump 1998 p. 17: Inflection is semantically more regular than derivation.

Examples

(a)

5. Derivational morphology is realized closer to the root than inflectional morphology is. (e.g., Stump 1998, p. 18¹¹)

Problems: Stump gives Russian example, p. 18.

Interesting problem cases:

1. *prefix* in English
2. The men inside the suits looked capable. Like NCOs. Wise to the way of the world, proud of their ability to get the job done. They were certainly ex-military, or ex-law enforcement, or ex-both. *Gone Tomorrow*, Lee Child, Chapter 10.

¹¹Stump notes the relation of this to the *Split Morphology Hypothesis* citing Perlmutter 1988, and Anderson 1982 and Thomas-Flinders ed 1981)

6.1 Idiosyncrasy in the derivational lexicon

See Table 6.1

-ist, -ism, and -ize:

moral- terror-

-ist only:

musical instruments, scientific disciplines (*pianist, biologist*)

-ist one sense, -ize a different sense, -ism a third sense:

organ-

-ist, -ism, -ize, 3 senses:

material-

-ize only:

winter-, woman-

How many combinations are there, and how many exist?

Are the following affixes inflectional or derivational?

soften (*Heating the cheese will soften it.*)

pollution (*The pollution of the forest was tragic.*)

reading (*I am reading a book.*)

reading (*The reading of the poem was beautifully done.*)

kingdom (*The knight rode across the kingdom.*)

happier (*My friend is happier than I am.*)

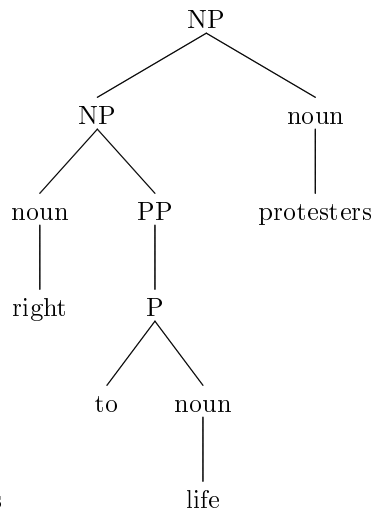
7 Compounds

Exocentric compounds:

Michael Connelly, *The Fifth Witness*, “I didn’t want to complicate things for you. You had the case to worry about. I was handling the two dirtbags who messed you up.” The referent of *t* is not a bag, nor dirt.

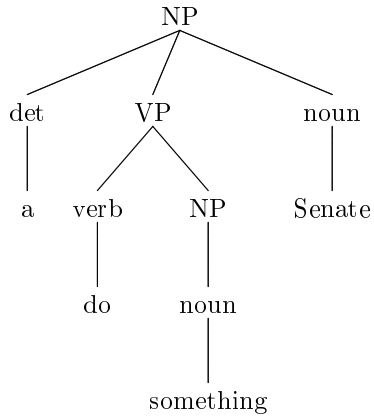
sans-papiers. “Courcaillet n’emploie que des sans-papiers corvéables à merci quand il a besoin de renforts. French Tabloids, Jean-Hugues Opperl.

Interesting cases:

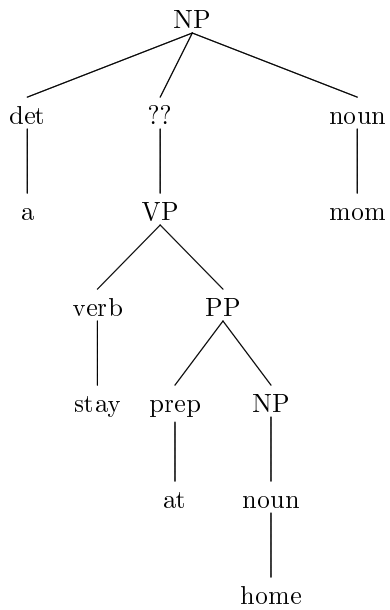


right to life protesters
has-been, an also-ran.

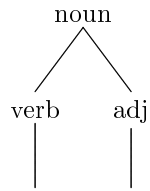
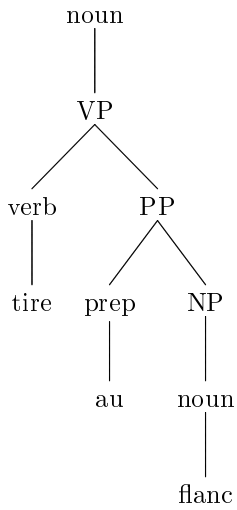
New York Time: "... becoming a do-something Senate." (Headline)



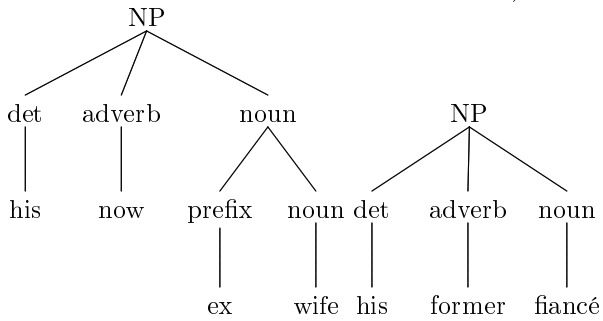
stay-at-home mom. stay-at-home husband, dad, pets, artist, health care. Stay at home working mothers. the stay at home lifestyle. opposite: working moms. The Chicago Stay at Home Moms meetup group. Stay at home senior care. Stay at home calculator. SaH jobs. Stay at work moms.



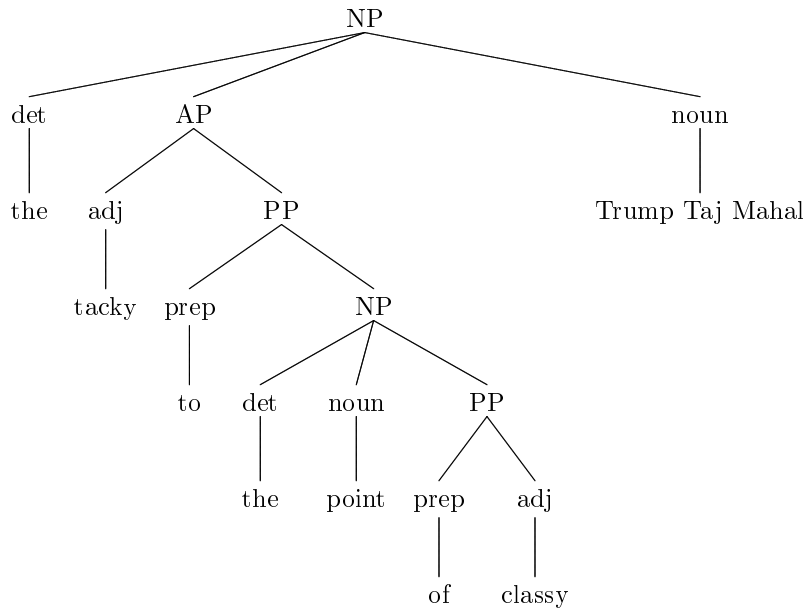
French
 repose-pied 'foot stool'
 les pas-bien-rasés (La belle de Fontanay)
 tire-au-flanc (someone who tries to get out of his chores)



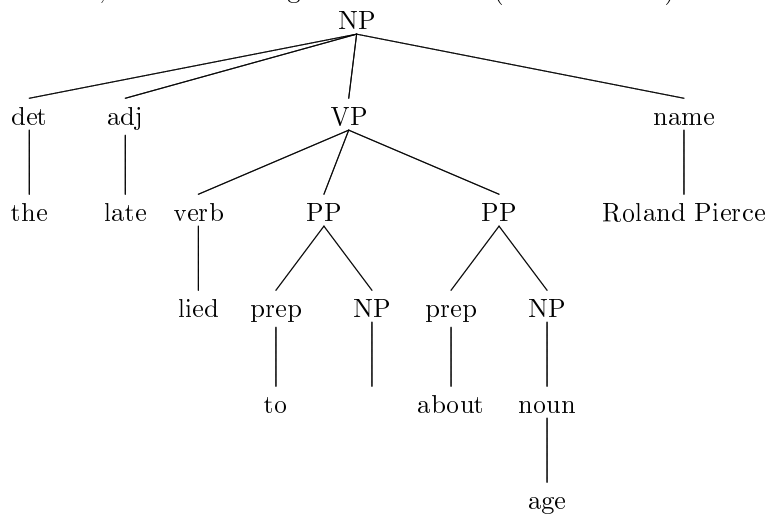
pense-bête '(gentle) reminder' pense bête
 his now ex-wife (not a compound issue, a semantic scope issue – goes counter to the ‘*he speaks Russian, even though he’s never been there’ observation). Like this: the future victim.



phrasal compounds
 the tacky-to-the-point-of-classy Trump Taj Mahal (Harlen Coben)

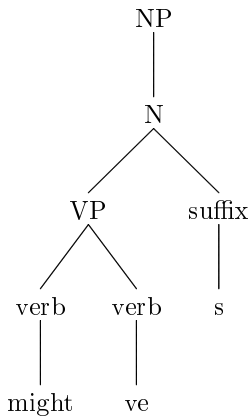


the late, lied-to-about-age Roland Pierce (Harlen Coben)



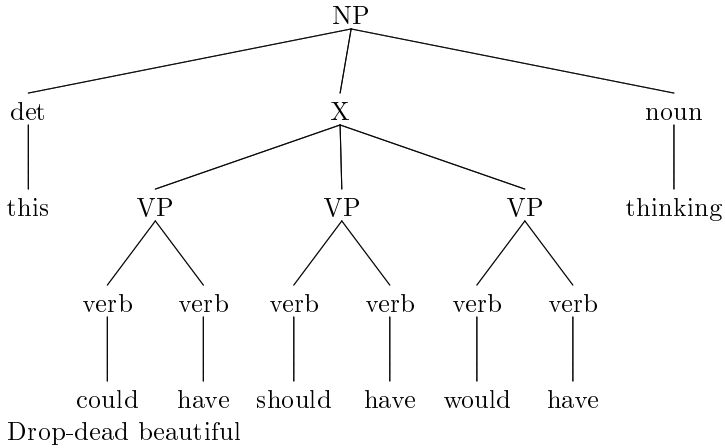
Michael Connelly, *The Fifth Witness*: That doesn't matter. The trial is about the state's evidence against Trammel. It's not about who else might have committed the crime. Might've's don't count.

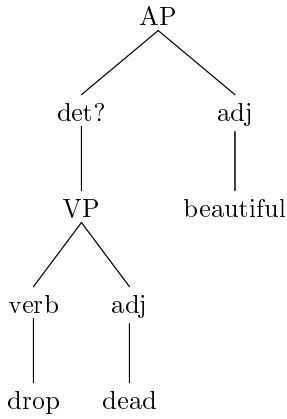
Also: <http://www.memoriesofmystical.com/lyrics/arthur.html> I am tired of excuses All these might've's and/or should've's. (Many more examples of this sort on the internet, notably using as a noun in this context.)



Woulda-Coulda-Shoulda, by Shel Silverstein
 All the Woulda-Coulda-Shouldas
 Layin' in the sun,
 Talkin' bout the things
 They woulda-coulda-shoulda done...
 But those Woulda-Coulda-Shouldas
 All ran away and hid
 From one little did.

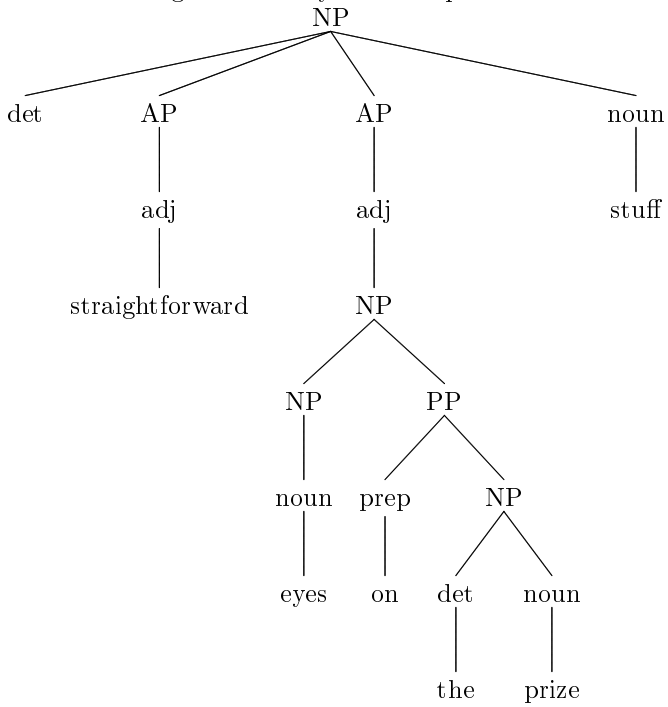
This coulda, shoulda, woulda thinking is dangerous and debilitating (source: <http://www.live-happier.com/2012/02/coulda-shoulda-woulda-will-kill-ya.html>)



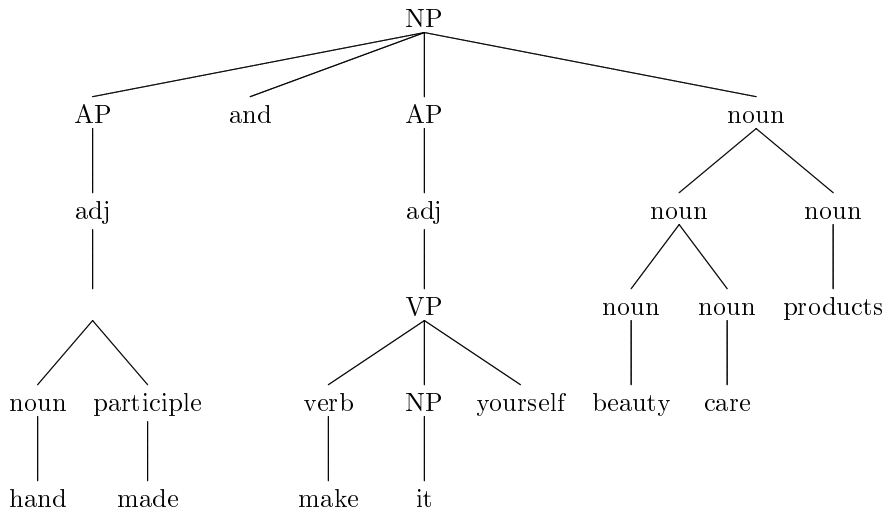


(Compare with French: *belle à couper le souffle*, *belle à (en) mourir*.)

From Michael Connelly, *The Fifth Witness*: Freeman spoke clearly and eloquently. No histrionics, no flash. It was straightforward eyes-on-the-prize stuff.



Cranberry Lane's natural product line of [AP [adj hand-made] and [make-it-yourself] beauty care products and Kits



French: Jean est un organisateur-né. Is this an adjective or a compound of some sort? c'est un homme d'affaires né. He's a born musician.

French: décrochez-moi-ça: From Mémoires d'un linguiste (Martinet), p. 51: ma femme d'alors qui avait accepté d'être vendeuse à la librairie allemande . . . puis un décrochez-moi-ça. (Can also mean: second-hand clothes).

un laissé-pour-compte: an outcast, someone society pays no attention to.

sa stratégie de j'y-suis-j'y-reste (referring to Copé's strategy vis-a-vis Fillon, November 2012)

car je me méfie du qu'en-dira-t'on, bref, des autres.

Celui-là, j'ai pensé, avec ses airs de moi-je-ne-veux-rien-dire-tous-des flics, il parlait beaucoup. Idem.

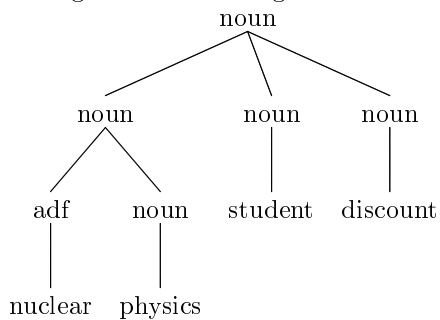
Les élèves faisaient du troc, de la braderie, du décrochez-moi-ça.

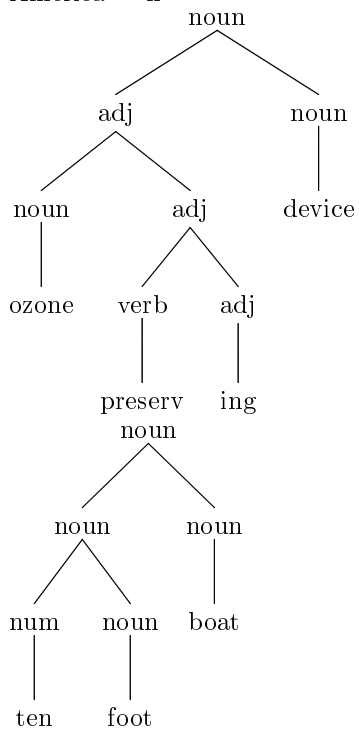
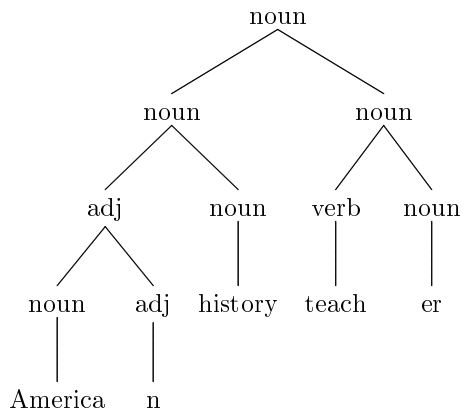
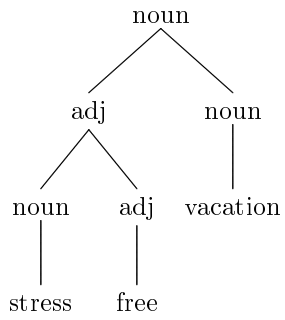
Casimir a encore fait quelques va-et-vient. . .

La belle de Fonetenay, Jean-Bernard Pouy.

7.1 Phrases in your compounds?

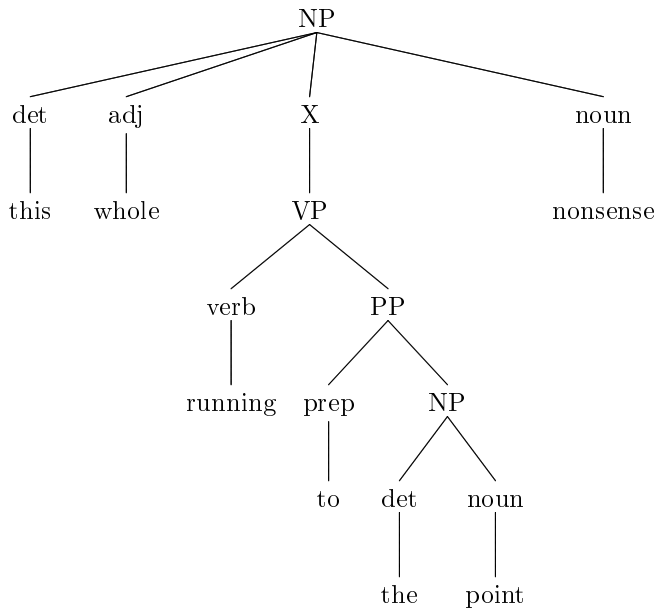
Emonds, A Common Basis for Syntax and Morphology. p. 237: No phrase ¹ occurs within an ⁰ (word). Emonds gives the following structures and examples:



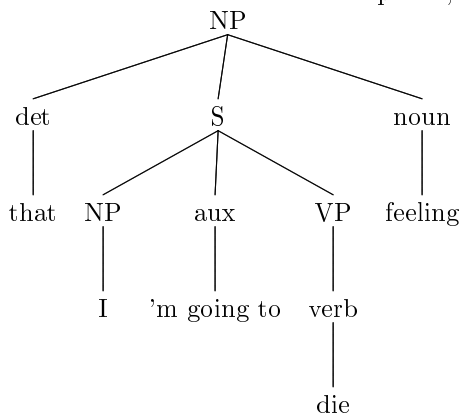


Julia GP's facebook page, June 2012

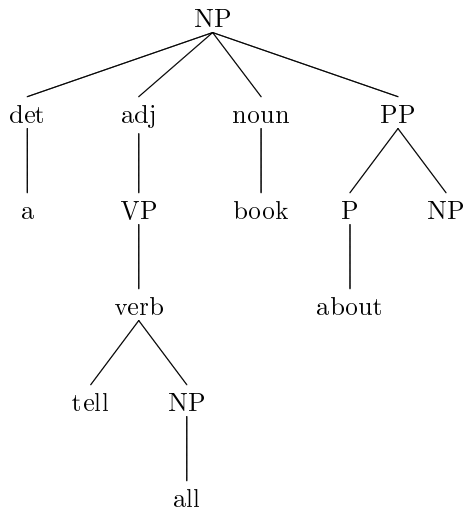
Reggie and I tried out this whole runningtothepoint nonsense. He was mildly enthused.



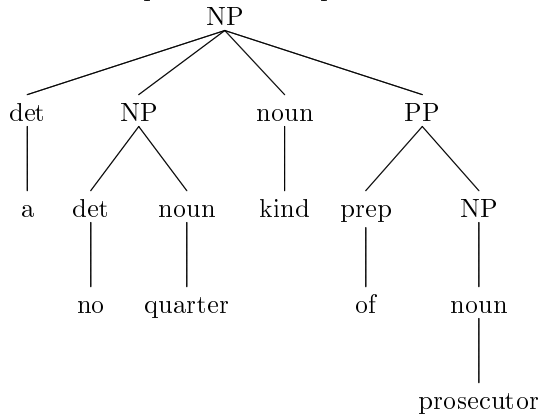
At least when when I don't sleep well, exercising gets rid of that "I'm going to die" feeling.



A tell-all book about what it's really like to work as a black maid... (from dustjacket of *The Help*)



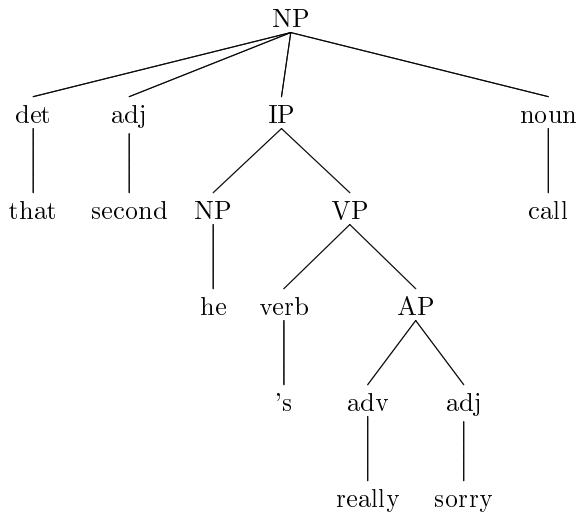
She's a no quarter kind of prosecutor. *The Fifth Witness*, Michael Connelly.



Il a haussé un peu les épaules, méfiant, genre ça ne te regarde pas. *La belle de Fontanay*, p. 193.
Emonds notes (footnote 5):

Some pedagogical grammars of English refer to “quotational compounds,” ranging from fixed phrases such as *“do it yourself” store* to nonce formations such as *a “gosh I don’t want trouble” type of guy*. The point of quotes in punctuation is that they indicate awareness that a generally non-embeddable construction is being used for effect in performance or even in the permanent lexicon. Thus **Mary murmured oh how cruel Bill is to herself* vs. *Mary murmured, “oh, how cruel Bill is” to herself*. Whenever compounds contain phrases as in [the examples I have just given] they are only acceptable as quotational in this sense. That is, they are grammatically ill-formed in embedded positions.

He gives some ungrammatical examples:
A large the boy next door doll was delivered
We didn’t expect that second he’s really sorry call.



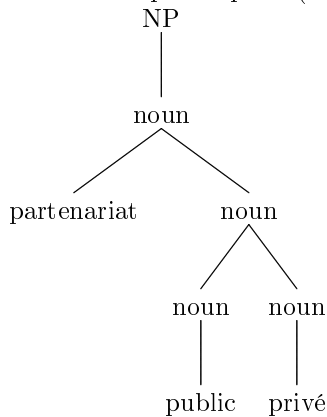
The city (*right) outside toilets are a disgrace.

The Paris (*very) red belt had many Communist mayors.

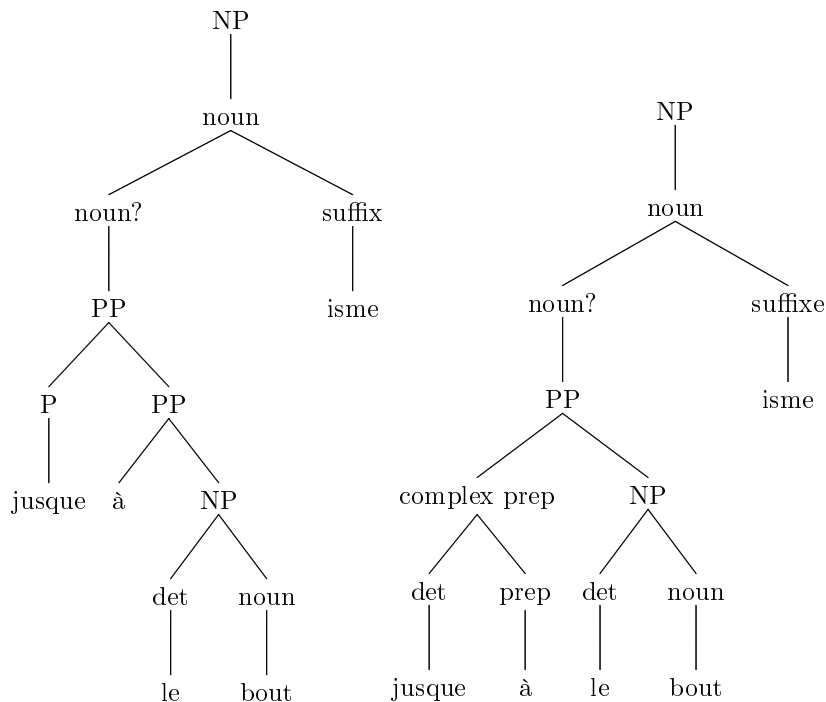
We do not know yet whether the *stay at home* kind of example is a case of a phrase within a word; it might still be (and probably is) a phrase within a phrase (an S within an NP, in this case).

French

Partenariat public-privé (PPP) (note that ‘public-privé’ is a coordinate compound).



Lucienne et Thérèse, atteintes de maladies incurables, peuvent rester chez elles grâce au réseau de soins palliatifs à domicile du sud-Essonne. Les soignants se relaient à leurs chevet, sans jusqu’au-boutisme. Le Monde, 3 novembre 2012.



7.2 Synthetic compounds

8 Clitics

Zwicky 1977 (IULC) has had a major defining impact on discussions of clitics in the years since it was circulated. As Anderson 2005 (Clitics) makes abundantly clear, the discussions of clitics (and their attendant behavior) ought to be carefully separated into those that focus on prosodic characteristics of clitics and those properties that relate to syntactic distribution. To spell this out a bit more: prosodic characteristics of clitics typically concern their lack of stress, and their forming some kind of phonological word with some other phonological material – typically a word – which appears to its right or left, on the basis of general syntactic structure of the language. The other kind of characteristic of a clitic that draws our attention is syntactic: in many cases, clitics do not occur where non-clitic words playing the same grammatical role do occur, and in many cases, the clitics appear where non-clitic words (again, playing the same grammatical role) cannot. Both of these suggestions are actually quite difficult to make precise. Let us consider several examples of each, and see if some examples will help clarify what we should be looking at.

1. Possessive ' in English:
 1. the book's author
 2. the king of England's crown
 3. the guy next door's bicycle
 4. the guy you met's best friend
 5. What made the guy you talked to's answer implausible?

The possessive ' follows a noun phrase functioning as a determiner in a larger noun phrase, and its placement is not conditioned in any way by what word happens to immediately precede it. That is a syntactic statement, and it allows us to describe simply where this morpheme appears. Still, it is unusual in that there is no other formative that can appear in the same position – and hence there is no free-standing word that shows (so to speak) that there is a syntactically definable position at the end of the NP's determiner. (Compare Japanese *no*).

From a prosodic point of view, it seems to be deficient, though: there is no way for it to be pronounced even as a free-standing syllable: it always forms a syllable with whatever precedes it.

Conclusion: Possessive is a clitic from a prosodic point of view, but not from a syntactic point of view. Syntactic characteristics of clitics.

8.1 Zwicky Pullum criteria

Zwicky and Pullum 1983 (English n't) give six diagnostics for distinguishing simple clitics and affixed words. They take typical examples of inflectional affixes to be as in English plural -s, verbal -ed, and adjectival -est.

1. Criteria A Clitics exhibit a low degree of selection with respect to their hosts while affixes exhibit a high degree of selection with respect to their stems. The person I was talking to's going to be angry with me. Z and P suggest that there is a conclusion that can be drawn from the pair: "I don't TRY not to pay attention; I just can't help it", *I don't tryn't to pay attention. . . . They suggest this is due to a restriction on what n't can attach to.

They also point out that when the *have* is not finite, a following *not* cannot contract onto it: Google reports 238 million hits to "to have not seen": "movies you're embarrassed to have not seen" (internet); "child reported to have not seen a doctor in the last 12 months"; "he claims to have not seen the texts." All of these are terrible with contracted *n't*.

2. Criteria B Arbitrary gaps in the set of combinations are more characteristic of affixed words than of clitic groups. Zwicky's intent here is to rule out cases where a lexical item idiosyncratically rejects a clitic combination.
3. Criteria C Morphophonological idiosyncrasies are more characteristic of affixed words than of clitic groups. The intent is to distinguish cases where morpheme-specific morphophonology can be associated with a suffix (prefix) but not with a clitic.
4. Criteria D Semantic idiosyncrasies are more characteristic of affixed words than of clitic groups.
5. Criteria E Syntactic rules can affect words, but cannot affect clitic groups.
6. Criteria F Clitics can attach to material already containing clitics, but affixes cannot. Cf. English I'd, I'd've (ZP example). And n't acts oddly here. We have "I wouldn't be doing this if it weren't necessary;"; and "I'd be in New York if I had my way;" but we don't have "*I'd'n't be doing this if it weren't necessary". Is this because n't isn't a clitic, but is an affix? That is Z and P's suggestion.

Zwicky and Pullum emphasize that the behavior of the "cliticized" n't is not like the contracted "ve": *Could've you done it? but fine: Could you've done it? Unlike: Couldn't he do it? And not: ?Could he not do it? They suggest that "I'd not be doing this if it were not necessary," but I think that is British, not my dialect.

Stump gives a nice example (p. 20) from Breton. There is more I haven't put here.

to me			
din	to me	deom	to us
dit	to thee	deoc'h	to you
dezañ	to him	dezo	to them
dezi	to her		

dam zad	to my father
dam gweloud	to see me
daz tad	to they father
daz kweloud	to see thee

8.2 Simple clitics

Simple clitics (in Zwicky's proposed terminology) just show up where the syntax would put them normally. These are phonological reductions, typically:

(14) You have seen a lot of movies.
You've

(15) He has seen a lot of movies.
He's

There are positions where this reduction is not permitted, related no doubt to the stress that is obligatory:

(16) Maybe you haven't seen a lot of movies, but I have
*I've .

(17) This book is longer than that one is
*one's .

Some English auxiliary verbs have weak forms; others don't. Those that do: *is*, *are*, *am*, *has*, *have*, *had*, *would*, *will*; but *may*, *might* do not. Nor does *were*: why is that? The possessive *have* does not have a reduced form.

Claim: Clitics do not trigger irregular morphophonology. The plural *-z* in English can trigger stem allomorphy, but the possessive clitic does not.

Claim: Clitics do not participate in semantic non-compositionality (i.e., semantic irregularity).

8.3 English *not* and *n't*

The case of the English clitic spelled *n't* is a bit different. It appears most of the time in a position where the word *not* appears:

(18) Lee is not always careful.
isn't

but not always; because (in some sense) it seems to form a word with the host that precedes it, it can be part of the inverted auxiliary in the following examples, unlike *not*.

(19) John is not hungry.
isn't

(20) Lee should not drink so much.
 shouldn't

- (21) (a) Isn't John hungry?
 (b) ?Is John not hungry?
 (c) *Is not John hungry?

- (22) (a) Shouldn't Lee be drinking more?
 (b) ?Should Lee not be drinking more?
 (c) *Should not Lee be drinking more?

But the same type of behavior is not found with auxiliary verb contract, ZP note; this is a very striking and clear fact:

- (23) (a) You could have done it.
 (b) You could've done it.
 (c) Could you have done it?
 (d) *Could've you done it.

So in the case of *n't*, what we see is that its strong coupling with its host somehow allows it to undergo syntactic shifting as a hitchhiker.

Zwicky and Pullum point out regarding their Criterion F: We have:

I wouldn't be doing this unless I had to.

and they say they also have :

I'd not be doing this unless I had to.

But neither of those leads to the possibility of

*I'd n' t be doing this unless I had to.

8.4 English possessive 's clitic

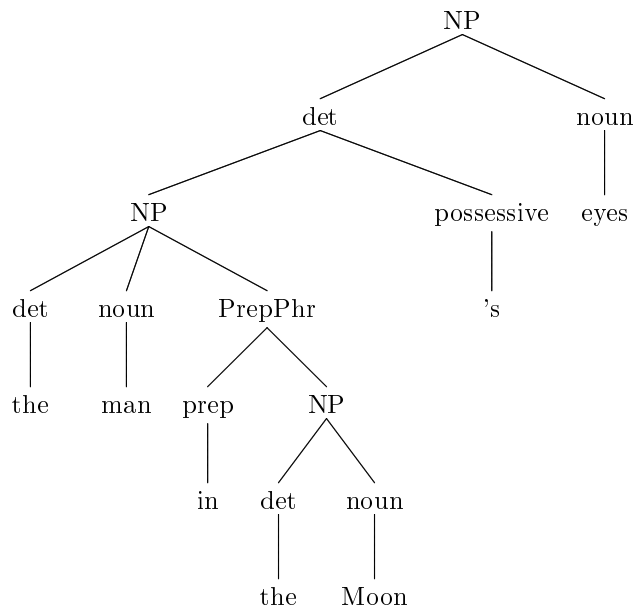
The English possessive 's is stranger than you may think, because from a syntactic point of view, it is an independent syntactic item, whose placement in a sentence is determined entirely by the syntax. It is not a marking on the preceding noun, which is what you might think (and which was once the case), if you only thought about examples like:

(24) The child's toys

The possessive 's appears *not* after the principal noun of the subject noun phrase, but at the end of an entire noun phrase (which in most circumstances, but certainly not all, is just a single noun).

Consider:

- (25) (a) the king of England's crown
 (b) the man in the Moon's eyes
 (c) someone else's problem
 (d) the guy who lives upstairs's girlfriend
 (e) the doctor I spoke to's recommendation was to have some more tests run.



8.5 Que, quoi...

1. Tu vois Marie. 'You see Marie.'
2. Qui vois-tu? 'Who do you see?'
3. Qui Jean voit-il? Who does John see?
4. Qui Jean a-t-il vu? Who has John seen?
5. Jean va à Paris. Jean goes to Paris.
6. Où Jean va-t-il? Where does Jean go?
7. Où va Jean? Where does Jean go?
8. Où est-il allé? Where did he go?
9. *Où est Jean allé? Where did John go?
10. Où est allé Jean? Where did Jean go?
11. Où Jean est-il allé? Where did Jean go?
12. Quel train Jean a-t-il pris? What train did Jean take?
13. Quel train a pris Tintin pour se rendre à la recherche des bandits? Which train did Tintin take to set off to find the bandits?
14. *Quel train a Jean pris?
15. Que vois-tu? What do you see?
16. Que voit-il? What does he see?

17. Que voit les nouveau-nés? What do new-borns see?

18. Qu'a-t-il dit? What did he say?

19. *Que Jean a-t-il dit? What did Jean say?

20. Qu'a dit Jean? What did Jean say?

Conversational style:

21. Qui tu préfères? Who do you prefer?

22. Tu préfères qui? *ibid.*

23. Tu as mangé quoi ce soir? What did you eat tonight?

24. *Quoi tu as mangé ce soir?

25. *Que tu as mangé ce soir?

26. ?Qu'as-tu mangé ce soir? (Fine sentence, just not clear that it's in the same stylistic register.)

There are two separate processes involved in the appearance of a subject to the right of the finite verb: (i) in one, a subject pronoun may appear immediately after the finite verb; this is compatible with the subject noun phrase appearing before the finite verb. The full NP subject cannot appear elsewhere. (ii) A full NP subject may appear after the main verb (not the finite verb).

The first construction is possible only in direct, not indirect questions. The second is equally compatible with direct and indirect questions.

27. Quand Jean est-il parti?

28. Quand est parti les derniers invités?

29. Je lui ai demandé quand les invités sont(*-ils) partis. I asked him when the guests left.

30. Je lui ai demandé quand sont partis les derniers invités.

Does the interrogative *que* need to appear to the left of the verb?

31. Que vous a dit le concierge? What did the concierge tell you?

32. Qu'en pensez-vous? What do you think of it?

33. Que lui est-il arrivé? What happened to him? Lit., what to-him has-it happened? The subject 'il' is neutral.

34. Que me donnez-vous comme conseil? What do you give me as advice?

35. Que lui avez-vous dit la première fois que vous l'avez vu? What did you say to him the first time you saw him?

36. Qu'y a-t-il dans les manuscrits de Timbouctou? (this week in the news) cf. Il y avait peu de choses dans les manuscrits.

8.6 French, Spanish verbal clitics

A different pattern is found in which the clitics appear in a syntactic position different from the non-clitic forms. We see this in many Indo-European languages. In French and Spanish, the clitic position is in front of the verb, in most cases; in some other European languages, it is in 2nd position.

Spanish:

- (26) (a) *yo tomo cerveza*
 I drink beer
 I drink beer.
- (b) *yo la tomo*
 I it drink
 I drink it (fem.)
- (c) **Yo tomo la.*
- (d) **Yo cerveza tomo.*
- (27) (a) *yo te doy el regalo.*
 I to-you give the gift.
 I give you the gift.
- (b) *yo te lo doy.*
 I to-you it give.
 I give it to you.
- (c) **Yo lo te doy.*
- (d) **Yo te doy lo.*

SM	dative	accusative	verb		gloss
el	me	lo	da		he gives it to me
el	te	lo	da		he gives it to you
*el	le	lo	da		
el	se	lo	da		he gives it to him
el	le		da	el regalo	he gives him the gift
el	se		da		he gives it to himself

<i>form 1</i>	<i>form 2</i>	<i>lexical category</i>
<i>dog</i>	<i>dogs</i>	noun
<i>run</i>	<i>runs</i>	verb

Table 2: English inflectional morphology

<i>affix</i>	<i>function</i>	<i>example</i>
-s	3rd sing. pres.	<i>He talks.</i>
-ed	past tense	<i>He talked.</i>
-ing	progressive	<i>He's talking.</i>
-ed, -en	past participle	<i>He talked.</i>
-s	plural (of noun)	<i>The cats are sleeping.</i>
Probably not inflectional morphology:		
-’s	possessive	<i>The cat’s food is ready.</i>
-er	comparative	<i>John is taller than Mary.</i>
-est	superlative	<i>John is Bob’s oldest son.</i>

present	past
<i>go</i>	<i>went</i>
<i>am</i>	<i>was</i>
<i>come</i>	<i>came</i>
<i>fall</i>	<i>fell</i>
<i>eat</i>	<i>ate</i>

Table 3: Irregular English inflectional morphology: verbs

singular	plural
<i>foot</i>	<i>feet</i>
<i>moose</i>	<i>moose</i>

Table 4: Irregular English inflectional morphology: nouns

gender	Number:singular	Number:plural
masculine	pequeño	pequeños
feminine	pequeña	pequeñas

n^o

Table 5: Spanish adjectives

gender	masc. sg.	masc.plural	fem. sg.	fem. plural
small	pəti	pəti	pətit	pətit
large	grã	grã	grãd	grãd
normal	normal	normo	normal	normal
green	ver	ver	vert	vert
red	ɤuɔ	ɤuɔ	ɤuɔ	ɤuɔ
good	bõ	bõ	bɔn	bɔn
gray	gɤi	gɤi	gɤiz	gɤiz
long	lõ	lõ	lõg	lõg
hot	fo	fo	fod	fod
white	blã	blã	blãf	blãf
fresh	fɤe	fɤe	fɤɛf	fɤɛf
false	fo	fo	fos	fos

Table 6: French adjectives: subtractive morphology

	Declension	1	2	3	4	5
	Meaning	woman	friend	city	fruit	day
	Gender	fem.	masc.	fem.	masc.	masc.
Singular	Nominative	fēmina	amīcū	urbs	fructus	diēs
	Genitive	fēminae	amīcī	urbis	fructūs	diēi
	Dative	fēminae	amīcō	urbī	fructuī	diēi
	Accusative	fēminam	amīcum	urbem	fructum	diem
	Ablative	fēminā	amīcō	urbe	fructū	diē
Plural	Nominative	fēminae	amīcī	urbēs	fructūs	diēs
	Genitive	fēminārum	amīcōrum	urbium	fructuum	dierum
	Dative	fēminīs	amīcīs	urbibus	fructibus	diēbus
	Accusative	fēminās	amīcōs	urbēs	fructūs	diēs
	Ablative	fēminīs	amīcīs	urbibus	fructibus	diēbus

Table 7: Latin nominal declensions

gloss	singular	plural
person	umuntu (cl. 1)	abantu (cl. 2)
hill	intaba	izintaba
leopard	isilo (cl.7)	izilo (cl. 8)
human race	isintu	
human quality	ubuntu	
poison	ubuthi	

Table 8: Some Zulu nouns

Doke	singular	plural
1	(1) umu-	(2) aba-
2	(3) umu-	(4) imi-
3	(5) ili-	(6) ama-
4	(7) isi-	(8) izi-
5.	(9) in-	(10) izin-
7.	(14) ubu-	
8.	(15) uku-	
9.	(16) pha-	
10.	(17) uku	

Table 9: Zulu noun prefixes, all classes

gloss	Class 1	Class 2
person	umuntu	abantu
man	umufu	abafo
father-in-law	umukhwe	abakhwe
Bushman	umuThwa	abaThwa
wife, woman	umfazi	abafazi
boy	umfana	abafana
child	umntwana	abantwana
friend	umngane	abangane
White	umlungu	abelungu
Sotho	umSuthu	abeSuthu
herdsman	umalusi	abelusi

Table 10: Zulu Class 1,2 nouns

gloss	verb	gloss	Class 1 noun	Class 2 noun
beget	-zala	parent	umzali	abazali
defend	-mela	advocate	ummeli	abameli
teach	-fundisa	teacher	umfundisi	abafundisi
learn	-funda	student	umfundi	abafundi
drive	-shayela	driver	umshayeli	abasheyli

Table 11: Zulu deverbal agentive nouns, classes 1 and 2.

	Noun	Adjective	Relative	Enumerative	Possessive	Subject	Object
Class 1:	umu-	om-	o-	mu-	wa -	u-	m-
Class 2:	aba-	aba -	aba-	ba-	ba-	ba-	ba-

Table 12: Noun class realizations

	Noun	Adjective	Relative	Enumerative	Possessive	Subject	Object
Class 3:	umu-	om-	o-	mu-	wa-	u-	wu-
Class 4:	imi-	emi-	e-	mi-	ya-	i-	yi

gloss	Class 3	Class 4
tree	umuthi	imithi
village	umuzi	imizi
finger	umunwe	iminwe
fire	umlilo	imililo
mouth	umlomo	imilomo

	Noun	Adjective	Relative	Enumerative	Possessive	Subject	Object
Class 1:	umu-	om-	o-	mu-	wa- -	u-	m-
Class 2:	aba-	aba-	aba-	ba-	ba-	ba-	ba-
Class 3:	umu-	om-	o-	mu-	wa-	u-	wu-
Class 4:	imi-	emi-	e-	mi-	ya-	i-	yi-
Class 5:	ili-, i:-	eli-	eli-	li-	la-	li-	li-
Class 6:	ama-	ama-	a-	ma-	a-	a-	wa-

<i>verbal base</i>	<i>derived noun</i>
sell	sell-er
write	writ-er
teach	teach-er
sing	sing-er
discover	discover-er

<i>affix</i>	<i>root</i>	<i>derived form</i>
-ation	is added to a verb finalize confirm	to give a noun finalization confirmation
un-	is added to a verb tie wind	to give a verb untie unwind
un-	is added to an adjective happy wise	to give an adjective unhappy unwise
-al	is added to a noun institution universe	to give an adjective institutional universal

Table 13: English derivational morphology

-ist	-ism	-ize
baptist	baptism	baptize
exorcist	exorcism	exorcize
terrorist	terrorism	terrorize
violinist	*violinism	*violinize
organist	!organism	!organize
publicist	*publicism	publicize
womanist	*womanism	womanize
materialist	materialism	!materialize
atheist (1568)	aetheism	!atheize
linguist (1588)	*linguism	*linguize
humanist (1589)	humanism	?humanize
rationalist (1627)	rationalism	!rationalize

Table 14: Some words

present			
Sg.	1	sam	Pl smo
	2	si	ste
	3	je	su

past			
Sg.	1	bih	Pl bismo
	2	bi	biste
	3	bi	bi

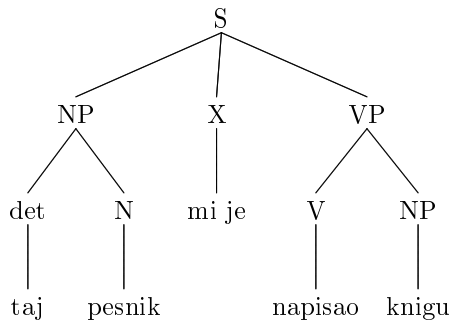
8.7 Serbo-Croatian

From Spencer textbook:

Wackernagel V2 position

- (28) *pisao sam pismo*
wrote aux letter
I (masc.) wrote a letter.
- (29) *pisal-a sam pismo*
wrote-fem aux letter
I (fem.) wrote a letter.
- (30) *juče ste čitali knjigu.*
yesterday aux read book
Yesterday you-m.pl. read a book.
- (31) *ovu knjigu smo već čitali.*
this book aux already read
We have already read this book.
- (32) *devojke su čitale ovu knjigu*
girls aux read this book
The girls were reading this book.
- (33) *ja bih čitao ovu knjigu.*
I aux read this book.
I would read this book.
- (34) *devojke su čitale ovu knjigu*
girls aux read this book
The girls were reading this book.
The clitics can appear inside a sentence-initial syntactic constituent:

- (35) *Taj pesnik mi je napisao knjigu*
 that poet 1st.dative aux wrote book.
 That poet wrote me a book.



- Taj mi je pesnik napisao knjigu*
 that poet 1st.dative aux wrote book.
 That poet wrote me a book.

Order of clitics: Auxiliary verbs appear *o* the dative and accusative clitics, except for the auxiliary verb (3rd sg.), which appears *t* them.

Aux	Dative	Accusative	Reflexive	(verbal)
-----	--------	------------	-----------	----------

Examples with Dative and Accusative, first without an auxiliary verb:

- (36) *ja mu ga dajem svaki dan.*
 I to-him it give every day.
 I give it to him every day.

- (37) *svaki dan mu ga dajem*
 every day to-him it give.
 I give it to him every day.

- (38) *dajem mu ga svaki dan.*
 give to-him it every day.
 I give it to him every day.

And examples with an auxiliary:

- (39) *juče sam joj ih dao.*
 yesterday aux to-her them gave.
 Yesterday I gave them to her.

- (40) *ja sam joj ih juče dao.*
 I aux to-her them yesterday gave.
 Yesterday I gave them to her.

- (41) *dao sam joj ih juče.*
 gave aux to-her them yesterday
 Yesterday I gave them to her.

Except! Except that the auxiliary appears at the end of the clitic sequence:

(42) *Jovan mi ih je dao*
 Jovan to-me them aux gave
 Jovan gave them to me.

(43) *dao mi ih je*
 gave to-me them aux
 (He) gave them to me.

9 Clippings

The case of modern French

o

<i>accro</i>	...ché	ado	...lescent	agglo	...mération		
<i>alcoolo</i>	alcoolique	<i>apéro</i>	apéritif	aristo	...crate		
biblio	...thèque	bio	...logique*	Casto	...rama		
catho	...lique	chimio	...thérapie	clodo	clochard		
coco	communiste	collabo	...borateur	compo	...sition		
cono	connard	crédit conso	...mmateur	croco	...dile		
<i>cuisto</i>	cuistance < cuisine						
éco	...nomie	diapo	...sitive	dico	dictionnaire		
diplo	...docus	<i>dirlo</i>	directeur	écolo	...gique		
édito	?	<i>facho</i>	fasciste	fluo	...rescent		
<i>franco</i>	franchement (adv.)	<i>frigo</i>	réfrigérateur	gastro	...entérite		
géo	...graphie						
gynéco	...logie	hebdo	...madaire	hecto	...litre		
hélico	...ptère	hétéro	...sexuel	hippo	...potame		
homo	...sexuel	immo	...bilier	info	...rmations		
<i>intello</i>	intellectuel	interro	...gation	labo	...ratoire		
Langues O	...rientales	lino	...léum	magnéto	...phone		
maso	...chite	mayo	...nnaise	McDo	...nald's		
<i>mécano</i>	mécanicien	mégalo	...mane	<i>métallo</i>	métallurgiste		
météo	...logique	micro	...phone	négo	...ciateur		
nympho	...mane						
ophthalmo	...logique	parano	...iaque	perso	...nnel		
philo	...sophie	photo	...graphie	poto	pote (Laks)		
pro	...fessionnel						
<i>prolo</i>	prolétariat	promo	...tion	prono	...stique		
<i>proprio</i>	propriétaire	proxo	proxénète	psycho	...logique		
radio	...graphie	réglo		resto	restaurant		
<i>sado</i>	sadiste	saxo	...phone	sciences po	...litiques		
socio	...logie	spéléo	...logie	stylo	...graphe		
texto	texte (SMS)	toxico	...logique(test)	transfo	...rmateur		
travelo	travestie	vélo	...cipède	ventilo	ventilateur		
vég'talo	(salade) végétarien	<i>véto</i>	vétérinaire	sono	...risation	rigolo	
hémorro	illico	marjo	marginal	loco	...motive	calmo	calme
perfecto	parfait, perfection	directo	directement	(ex-)trotsko	trotskiste	exhibo	exhibitionis
sono	...risation						

a	calva fana méga	...dos ...atique ...octet	cata giga prépa	...strophe ...octet ...ratoire	compta giga sympa	comptable ...ntesque ...thique
b	comme d'hab mob	...itude ...ylette	comptab pub	...le ...licité		
c	proc	...ureur				
ch	bioch	...émie				
é	cathé Libé télé	...chisme ...ration ...vision	ciné pédé	...ma ...raste	kiné récré	...sithérapeute ...ation
eu	dégeu	...lasse				
f	benef manif périf	...estation ...érique	conf perf prof	...érence ...usion ...esseur	justif perf sous-off	...ormance ...icier
g	agreg	...ation				
i	amphi ordi	...théâtre ...nateur	ampli poly	...ficateur ? ...copie	gaspi psy	...? llage ...chologiste
j	ti-dej	...euner				
c	alloc d'ac impec réduc	...ation ? ...cord ...cable	bac doc provoc ultraréac	...calauréat ...tionnaire	fac réac	...ulté ...tionnaire
x	intox	...ification ?	max			

l	biocel	...lulaire	compil	...	spes	spécial
m	clim crim perm	...atisation ...inel ...ission	com diam	...mission ...	com gym	...munication ...
ms	télécoms					
p	bon ap bon app sup	rès-midi ...étit ...	heures sup	...plémentaire	stup	...
ps	Nouvel Obs	...ervateur	stups	...		
r camtar	anar campingcar	...chiste	hyper	...marché	imper	...méable
ch	boul Mich	cinoche				
s	sensass	...ionnel espress ...o				
ts	stats	statistiques				
t	appart du mat Transat	...ement ...in ...lantique	cafet institut	...eria ...utrice	dissert maths	...ation mathématiques
u	accu(s) aluminium	actu Sécu	...alités ...rité		
z	occase	...				
j	petit dej	...euner				

10 Morphology and Syntax

Spoken language plays out in time in a fashion that allows us relatively easily to express it as a sequence of phonetic segments, and above the level of the phonetic segment we are accustomed to building a theory of hierarchical structure. Morphology, as we have studied it so far, is concerned with word-internal structure, and syntax with structure above and beyond the word. Are these two kinds of analysis really different, when all is said and done? Is it possible to coherently separate the syntactic generalizations from the morphological generalizations in all languages, or even in some languages?

It is uncontroversial to say that syntax is concerned in the ways in which words are put together to form sentences, but it is not uncontroversial to say that morphology is about how words are put together in a parallel sense. In some cases – and in some languages – we can easily analyze a word into a set of pieces, one after another, each associable with a meaning or a grammatical function. The traditional term for those pieces is *o*, and it is closely related to *o*, a term which we have already used.

The item and arrangement view of morphology is close in spirit to the view that words are put together out of morphemes (or, if you prefer, are straightforwardly analyzable into morphemes) in a way that is much like syntax. Morphemes, on this view, are typically either roots of a basic lexical category (noun, verb, adjective) or are associated with morphosyntactic features. -s, on this view, is associated with the features verbal, 3rd person, singular, present tense.

The item and process view is skeptical of the importance given to concatenation by the item and arrangement view. The ablauted strong verbs of English (sang, began, ran) are related to ('derived from,' if you

wish) verb stems with different vowels (sing, begin, run), and that relationship is not plausibly construed as concatenation (at least, in a recognized sense of the term); why should concatenation be given a privileged status? ask the item-and-process morphologists.

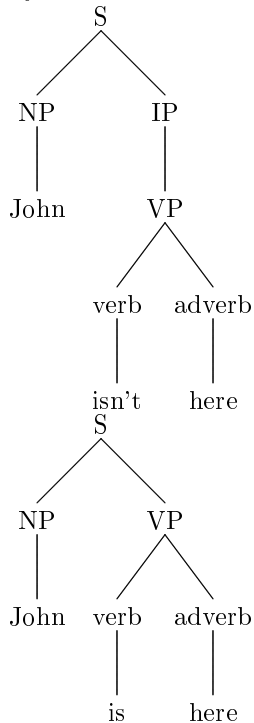
11 The Lexicalist hypothesis

Anderson 1988 (“Inflection”) gives this account: The syntax neither manipulates nor has access to the internal form of words.

11.1 English *n t*

Zwicky and Pullum 1983 argued that forms like *on't* and *n't* are not formed with clitics, but are part of an inflectional morphological system for English.

Syntactic tree:



11.2 Unergatives and unaccusatives

Work by Chvany, Perlmutter, Postal, Burzio, and later many others has focused on two different kinds of intransitives, now often called unaccusatives and unergatives.

Unergatives: cry, work, play, laugh, hiccup, dance, sneeze
the list that follows is from Ue:

Unaccusative: burn, sink, melt, dry, exit, occur, arise, shine, glitter, jingle, stink

Suffix *-er*. Di Sciullo notes (but this must be noted much earlier – find good reference) that to some degree, the use of *-er* on intransitive verbs aligns with the unaccusative/unergative distinction – she gives

	unergative	unaccusative	true transitives
these examples:	a swimmer	* a faller	a serial killer
	a boxer	* an arriver	a compulsive eater
	a dreamer	* a departer	a famous producer
	a (hard) worker	* a bloomer	a fast writer
But			
unergative	unaccusative		
<hr/>			
	she's a real looker		

Michael Connelly, *The Fifth Witness*. I zeroed in on juror number three who sat in the middle of the front row of the box. ... He was my hanger, the one juror I was counting on to vote my way all the way. Even if it hung the jury. [...] When I heard him speak with a southern accent I knew I had my hanger.

12 Ordering and tactics

The question as to whether the order of morphemes in words can or should be understood with the same mechanism as order of words and phrases in syntax. The exploded INFL hypothesis, starting with Pollock 1989 (check date) is a strong version of the proposal that some morphotactics (ordering of morphemes) can be identified with syntax.

12.1 Portmanteau words: French

du from de le, au from a le.

13 What is a word?

Qu'est-ce qu'un mot? Knud Togeby. *Travaux du Cercle linguistique de Copenhague*, vol 5: *Recherches structurales*, Copenhague: Nordisk Sprog- og Kulturforlag 1949. 97-111.

13.1 Syntax

1. A word can form an utterance; nothing smaller than a word can.

Problems: Noted by Aronoff and Fudeman: *Whose book is this?* *My.

They also note:¹²

It's May, it's May, th emonth of "yes, you may"

The time for every frivolous whim, proper or -

... When all the world is brimming with fun, wholesome or *n*

2. Coordination tests

¹²From *a l t*

13.2 Phonology

14 Morphophonology

There are some phonological rules or processes (or generalizations) that can be expressed without any reference to anything morphological—in particular, without reference to words, word-boundaries, morphemes, or the like. These generalizations can be stated purely in phonological ways, making reference only to sounds. But this is a relatively small part of what phonologists study; much of what phonologists study can be characterized only if one has access to *o* information that is ‘morphological’—notably the presence of word-boundaries or morpheme-boundaries.

Let us consider a few examples of ‘purely’ phonological generalizations, and then some that cannot be stated without some reference to where words begin or end.

14.1 Pure phonology

1. Spanish stop/spirant alternation
2. German final devoicing: variant in which it is purely syllable based.

14.2 Phonology requiring access to word-boundaries

1. English flapping
2. German velar/palatal fricative (*n*)

14.3 Some morphemes do it, some don’t

1. Spanish diphthongization
2. h-aspiré and liaison

15 More Zulu

Morphological patterns

Basic nominal prefix

‘nasal’ or ‘strong’			
1	mu	2	ba
1a	*	2a	*
3	mu	4	mi
5	li	6	ma
7	si	8	zi
9	ni	10	zin
11	lu		
14	bu		
15	ku		

Process analysis:

1. Add augment: prefix to item CV a copy of the vowel V.
2. If Head is a noun, then:

3. 1a, 2a: use u,o instead.
4. li (5), lu (11) are zeroed (i.e., deleted).
5. Pre-penultimate u in Class (1,3) is deleted.
6. i in Class 9 is deleted.
7. 3. If Head is an adjective, then: Treat Class 8 as Class 10.
8. Syntax: /a/ intervenes between noun and following adjective.

Basic verbal

oral or 'weak' pattern			
1	u	2	ba
3	u	4	i
5	li	6	a
7	si	8	zi
9	i	10	zi
11	lu		
14	bu		
15	ku		
1st	ngi	si	
2nd	u	ni	

(Note that “ni” counts as part of the oral” pattern; “oral” is just a mnemonic label, not to be taken seriously. “Weak” would be just as good, maybe.)

Non-initial morphemes with empty onset: Class 1: ku a - wa i - yi u - wu

Doke's relative construction: 1. 'a' 2. Augment (copy of vowel of prefix) 3. oral prefix (see above)

Object verbal			
prefix			
1	mu (nasal)	2	ba
3	wu	4	yi
5	li	6	wa
7	si	8	zi
9	yi	10	zi
11	lu		
14	bu		
15	ku		
1st	ngi	si	
2nd	u	ni	

Note: (3,4,6,9) is predictable: [w,y] emerges because onset is obligatory. Class 1 mu is the one unexpected member: it is the nasal member rather than the oral.

Doke's “pronouns”:

	sg		pl.
1	yena	2	bona
3	wona	4	yona
5	lona	6	wona
7	sona	8	zona
9	yona	10	zona
11	lona		
14	bona		
15	khona/kona?		
1st	mina		thina
2nd	wena		nina

All except those in bold appear to be formed by the pattern [Oral-Prefix + /o/] + /na/. The exceptions appear to have four distinct morphemes: mi-, thi-, we-, ye-.

2. demonstrative /la/ + V + Oral prefix + ...

Class	here	la-V-Oral	there	la-V-Oral+o	yonder	la-V-Oral-(a)ya:
1	lo	la-u or la-u-u	lowo	la-u-u-o	lowaya:	la-u-u-ya:
2	laba	la-aba	labo	la-a-ba-o	labaya:	la-a-ba-ya:
3	lo	la-u or la-u-u	lowo	la-u-u-o	lowaya:	la-u-u-ya:
4	le	la-i or la-i-i	leyo	la-i-i-o	le:ya:	la-i-i-ya: !!
5	leli	la-i-li	lelo	la-i-li-o	leliya:	la-i-li-ya:
6	la	la-a or la-a-a	lawo	la-a-a-o !!	lawaya:	la-a-a-ya:!!
7	lesi	la-isi	leso	la-i-si-o	lesiya:	la-i-si-ya:
8	lezi	la-izi	lezo	la-i-zi-o	leziya:	la-i-zi-ya:
9	le	la-i or la-i-i	leyo	la-i-i-o	le:ya:	la-i-i-ya: !!
10	lezi	la-izi	lezo	la-i-zi-o	leziya:	la-i-zi-ya:
11	lolu	la-ulu	lolo	la-u-lu-o	loluya:	la-u-lu-ya:
14	lobu	la-ubu	lobo	la-u-bu-o	lobuya:	la-u-bu-ya:
15	lokhu	la-uk[h]u	lok[h]o	la-u-ku-o	lokhuya:	la-u-ku-ya:

The “yonder” forms are a bit puzzling; they suggest sometimes a suffix -aya and sometimes -ya.

	yonder	la-V-Oral- ya:	la-V-Oral- aya:
1	lowaya:	la-u-u-ya:	la-u-u-aya:
2	labaya:	la-a-ba-ya:	la-a-ba-aya:
3	lowaya:	la-u-u-ya:	la-u-u-aya:
4	le:ya:	la-i-i-ya:	la-i-i-aya:
5	leliya:	la-i-li-ya:	la-i-li-aya:
6	lawaya:	la-a-a-ya:	la-a-a-aya:
7	lesiya:	la-i-si-ya:	la-i-si-aya:
8	leziya:	la-i-zi-ya:	la-i-zi-aya:
9	le:ya:	la-i-i-ya:	la-i-i-aya: ?
10	leziya:	la-i-zi-ya:	la-i-zi-aya:
11	loluya:	la-u-lu-ya:	la-u-lu-aya:
14	lobuya:	la-u-bu-ya:	la-u-bu-aya:
15	lokhuya:	la-u-ku-ya:	la-u-ku-aya:

quantitative

	onke all, each	Oral-prefix + onke		
	sg	pl.		
1	wonke	u-onke 2	bonke	ba-onke
3	wonke	u-onke 4	yonke	i-onke
5	lonke	li-onke	6	onke a-onke
7	sonke	si-onke	8	zonke zi-onke
9	yonke	i-onke	10	zonke zi-onke
11	lonke	lu-onke		
14	bonke	ba-onke		
15	konke	ku-onke		
1st	wonke	u-onke	sonke	si-onke
2nd	wonke	u-onke	nonke	ni-onke

The 1st person singular (and maybe 2nd person singular) is/are odd; they seem to be using 3rd person. dwa ‘only’ both, all-of-a-set i. All formed by Oral-prefix + /o/; plus Class 1 yo we. 4. qualitative adjectives: i. used with about 18 stems; ii. take prefixes based on augment (‘V’) + basic nasal prefixes; “linked” to preceding head by morpheme /a/; these are nouns. relatives: used with i. about 50 stems, whose semantic domain does not appear notably different from that of the adjectival stems; these are (uninflecting?) verbs? ii. true (inflected) verbs iii. “linked” to what precedes by morpheme /a/, plus augment (V) plus oral (i.e., verbal, weak) prefix markers. enumeratives: used with i. four stems: nye ‘one’, phi ‘which?’, ni ‘what?’, mbe ‘a different one’ ii. take nasal prefixes: that is, these are nouns. possessive i. [Oral-PrefixPossessed] + /a/ +

Personal forms of possessor are different:

Singular Plural

1st -mi -ithu

2nd -kho -inu

3rd -khe (follows regular pattern)

Phonology:

a e i o u

a a o o

e

i

o (y)o

u (w)o

16 Case studies

16.1 Radar, gaydar, etc.

From the internet (downloaded May 8 2012)

<http://askasexywomananything.tribe.net/m/thread/f80c1fda-331d-40d6-9d4e-dc58964d6f5c> Note that this is dated 2006.

- ar SV Sat, May 13, 2006 - 10:58 PM by SV

I have excellent crazy-dar, I also have very good ass-dar. Great-for-a-straight-girl T-dar (transgender)...hmm good alt-dar, pretty good lie-dar.

Bad drinker-dar. I don't pick up on who is a big drinker, or if someone is drunk or stoned.

So what are you good at picking up on? and what are you terrible at picking up on?

- Re: dar Lei Sat, May 13, 2006 - 11:02 PM by Lei
I have a brilliant emotional radar..I can tell how someones feeling quicker than I can say lickety split!
- Re: dar MsMary Sat, May 13, 2006 - 11:04 PM by MsMary
As you already know, SV, I've got pretty good "drinker-dar" but I *suck* at crazy-dar, unless it's really blatant and by that, I mean bad crazy ... I *do not* lump chemical imbalances and depression as "crazy" - sooooo not the same!!!
- Re: dar SV Sat, May 13, 2006 - 11:35 PM by SV
yes not the same. I also can feel bi-polar from people sometimes. but not always.
- Re: dar SV Sat, May 13, 2006 - 11:38 PM by SV
I am good at feeling people's feelings sometimes too. But I bet you're feeling-dar is excellent!
- Re: dar Blue Sun, May 14, 2006 - 4:51 AM by Blue
good- gay-dar, emotion-dar, lie-dar (well honed even if I choose to ignore it)
bad - love-dar, integrity-dar, caring-dar
no wonder I can't seem to hook up with the kind of guy I deeply desire. I shut them out before they have a chance. They go down in my book as boring dorks. Not sure how to change that. For right now my rule of thumb is "Run!!! If you're attracted he's all wrong for you!"
- Re: dar IceStormRed Sun, May 14, 2006 - 6:56 AM by IceStor...
I've got REALLY good gay-dar. I've known it even before they're willing to accept it. I've also got pretty good poor-integrity-dar and pass-the-buck-dar. I get a pretty good sense when some one's full of shit. My drinker-dar is good as well.
My ass-dar equipment is in the shop for repairs ccurrently - I hope to have it up to par soon.
I also don't have good he's-into-me-dar. I'm thick as a box of rocks when it comes to picking up on the romantic interest of a good guy. I'm oblivious. That probably is strongly connected to the poor functioning ass-dar.
- Re: dar firemermaid Sun, May 14, 2006 - 9:32 AM by firemer...
When I open myself up to it, I've got so much emotion-dar that it can be overwhelming. I have been learning to separate the feelings of others from my own. But i can't even sleep in a room w/ lots of people- too much energy. Pretty good gay-dar, substance-abuse-dar, shmuck-dar.

17 Problems

17.1 Basque

Some verbs in this language have three nonfinite form (not marked for tense or subject/object agreement). Here are some examples. Determine the prefixes and suffixes for each word. Express any generalizations that you find in simple English.

Participle	Verbal noun	Short stem	Meaning
Group 1			
ebaki	ebakitze	ebaki	cut
edan	edate	edan	drink
egosi	egoste	egos	boil
eho	ehotze	eho	grind
erori	erortze	eror	fall
erosi	eroste	eros	buy
eutsi	euste	euts	take hold (of)
ezarri	ezartze	ezar	put, place
ego(n)	egote/tze	ego(n)	go up, rise
ikasi	ikaste	ikas	learn
ipini	ipintze	ipin	put
ireki	irekitze	ireki	open
itzali	itzaltze	itzal	go/put out (light, fire)
itzuli	itzultze	itzul	return
jaitsi	jaiste	jaits	go down
jan	jate	jan	eat
jantzi	jantze	jantz	dress
jarri	jartze	jar	put
jin	jite	jin	come
jo	jotze	jo	strike

Group 2			
afaldu	afaltze	afal	eat supper
aldatu	aldatze	alda	change
garbitu	garbitze	garbi	clean
oheratu	oheratze	ohera	go/put to bed
poztu	pozte	poz	be/become happy
bainatu	bainatze	baina	bathe
barkatu	barkatze	barka	forgive
begiratu	begiratze	begira	look after, look at, observe
kantatu	kantatze	kanta	sing
galdu	galtze	gal	lose
hartu	hartze	har	take
kendu	kentze	ken	take away
saldu	saltze	sal	sell
sartu	sartze	sar	enter
atera	ateratze	atera	take out, go out
bota	botatze	bota	throw
hil	hiltze	hil	die, kill
hasi	haste	has	begin

	Sg	Formal	Pl
1	nas		gara
2	gas	sara	sarae
3	da		dire

Table 15: Absolutive auxiliary

	Conjugating verbs		
	singular	plural	gloss
Present			
1st person	naiz	gara	to be
2nd person	haiz	zara	
1st person	nabil	gabiltza	to go about
2nd person	habil	zabiltza	
1st person	nau	gaitu	to have
2nd person	hau	zaitu	
1st person	nakar	gakartza	to bring
2nd person	hakar	zakartza	
Past			
1st person	nintzen	ginen	to be
2nd person	hintzen	zinen	
1st person	nenbilen	genbiltzan	to go about
2nd person	henbilen	zenbiltzan	
1st person	ninduen	gintuen	to have
2nd person	hinduen	zintuen	
1st person	nindekarren	gindekartzan	to bring
2nd person	hindekarren	zindekartzan	
Hypothetic			
1st person	banintz	bagina	to be
2nd person	bahintz	bazina	
1st person	banenbil	bagenbiltza	to go about
2nd person	bahenbil	bazenbiltza	
1st person	banindu	bagintu	to have
2nd person	bahindu	bazintu	
1st person	banindekar	bagindekartza	to bring
2nd person	bahindekar	bazindekartza	

3 Singular absolutive			
Dative	Sg	Formal	Pl
1	dat		daku
2	dak (m.); dana (f.)	datzu	datzues
3	dako		dakoe
3 Plural absolutive			
1	dats		dakus
2	dask (m.); dasna (f.)	datzus	datzues
3	dakos		dakoes

Table 16: Absolutive-dative auxiliary

1st Singular Absolutive			
Ergative	Sg	Formal	Pl
1			
2		nosu	nosue
3	neu		neue
1st Plural Absolutive			
1			
2		gosues	gosues
3	gaitu		gaitue
2nd Singular Formal Absolutive			
1	saitut		sara
2			
3	saitus		saitue
2nd Plural Absolutive			
1	saituet		sarae
2			
3	saitue		saituee

Table 17: Absolutive-ergative auxiliary

17.2 Futa Fula

Gloss	simple form	this X	one X	good X
person	aːdeŋ	oː aːdeŋ	aːdeŋ goːto	aːdeŋ moʔdˈyoʔ
child	paikuŋ	kuʔuŋ paikuŋ	paikuŋ goːtuŋ	paikuŋ moʔdˈyuŋ
chicken	gertogal	ŋgaʔal gertogal	gertogal goːt al	gertogal moʔdˈyal
horse	puttyu	ŋuʔu puttyu	puttyu woːt u	puttyu moʔdˈyu
life	ŋgurndaŋ	daʔaŋ ŋgurndaŋ	ŋgurndaŋ goːtaŋ	ŋgurndaŋ moʔdˈyaŋ
lie	fenaːndeʔ	dɛʔɛ fenaːndeʔ	fenaːndeʔ woːtɛɛ	fenaːndeʔ moʔdˈya
food	dˈyiːdˈyaŋ	daʔaŋ dˈyiːdˈyaŋ	dˈyiːdˈyaŋ goːt aŋ	dˈyiːdˈyaŋ moʔdˈyaŋ
believing	gomdˈiŋdˈoʔ	oːgomdˈiŋdˈoʔ	gomdˈiŋdˈoʔ goːto	gomdˈiŋdˈoʔ moʔdˈyoʔ
day	nyalaːndeʔ	dɛʔɛ nyalaːndeʔ	nyalaːndeʔ woːtɛɛ	nyalaːndeʔ moʔdˈyɛɛ
shadow	dˈouːdi	diʔi dˈouːdi	dˈouːdi woːtiri	dˈouːdi moʔdˈiri
bottle	biːniri	diʔi biːniri	biːniri woːt iri	biːniri moʔdˈiri
judgment	nyaːwoːɾɛʔ	dɛʔɛ nyaːwoːɾɛʔ	nyaːwoːɾɛʔ woːtɛɛ	nyaːwoːɾɛʔ moʔdˈyɛɛ
mercy	yurmeːndeʔ	dɛʔɛ yurmeːndeʔ	yurmeːndeʔ woːtɛɛ	yurmeːndeʔ moʔdˈya

Find a morphological analysis of this data from Futa-Fula. Notice that the data is organized in this way: there are 13 stems, and each is presented in 4 forms: as a free standing word, with the word for *this* before it, with the word for *one* before it, and with the word for *good* after it. Fill in the free standing words in the table below. Note that the raised dot marks vowel length.

1. Break the words for *one* into morphemes. Find any prefix, stem, and suffix that may be present in each case.
2. Do the same for the words for *good*.
3. Do the same for the words for *this*, though there are two words that seem too short to be analyzed. Do the best you can with them.

	this			one			good		
	prefix	root	suffix	prefix	root	suffix	prefix	root	suffix
aːdeŋ									
paikuŋ									
gertogal									
puttyu									
ŋgurndaŋ									
fenaːndeʔ									
dʻyiːdʻyaŋ									
gomdʻiŋdʻoʔ									
nyalaːndeʔ									
dʻoudi									
biːniri									
nyaːwoːreʔ									
yurmeːndeʔ									

4. Although there are 13 rows of data, there are 5 pairs of stems whose morphological properties are identical. Rewrite the table, putting each of these pairs into a single row.

	this			one			good		
	prefix	root	suffix	prefix	root	suffix	prefix	root	suffix
aːdeŋ									
paikuŋ									
gertogal									
puttyu									
ŋgurndaŋ									
fenaːndeʔ									
dʻyiːdʻyaŋ									
gomdʻiŋdʻoʔ									

5. Focus on the word for *t* . What is the generalization that you find about the vowel that immediately precedes and follows the glottal stop in this column?

Answer:

6. Assume that one of the allomorphs of this is /ʔ/, the glottal stop, and that when this morpheme is preceded by a consonant and followed by a vowel, a copy of the following vowel is added before the glottal stop. Thus the form [kuʔuŋ] really comes from k -ʔ-uŋ, where k is a prefix. Rewrite the table above, with these assumptions.

	this			one			good		
	prefix	root	suffix	prefix	root	suffix	prefix	root	suffix
aːdeŋ									
paikuŋ									
gertogal									
puttyu									
ŋgurndaŋ									
fenaːndɛʔ									
dˈyiːdˈyaŋ									
gomdˈiŋdˈoʔ									

17.3 Isthmus Zapotec

1. In the data below, make the best cut that you can in order to divide each word into a prefix plus a suffix. Make a table with an entry for each stem, and then each prefix.

- For each, count the score: first the count of how many different realizations there are for each morpheme, and then the total number of letters (phonemes) in all of the forms combined.
- Calculate the score separately for the stems and for the prefixes, and then add the two for the total score.
- If you can find more than one way to analyze the data, chose the way that minimizes the score.

gloss	Habitual	Potential	Future
get dressed	raku	gaku	zaku
clean (field)	raana	gaana	zaana
receive (gift)	raʔde	gaʔde	zaʔde
drink	reʔ	geʔ	zeʔ
come	reeda	geeda	zeeda
eat	ro	go	zo
enjoy	ryaka	gyaka	zyaka
little	riwiini	giwiini	zawiini
answer	rikabi	gikabi	zakabi
worn out	ridubi	gidubi	zadubi
push	rila	gila	zala
lost	riniti	giniti	zaniti
leave	riree	giree	zaree

gloss	Allomorphs	Score
get dressed		
clean (field)		
receive (gift)		
drink		
come		
eat		
enjoy		
little		
answer		
worn out		
push		
lost		
leave		
Score:		
Habitual		
Potential		
Future		
Score		
Total		

2. Divide your stems up into those that begin with a vowel, those that begin with a glide, and those that begin with another consonant.

Begins with consonant	Begins with vowel	Begins with glide

3. How are the prefixes realized before each of these cases?

Prefix	Begins with consonant	Begins with vowel	Begins with glide
Habitual			
Potential			
Future			

4. Consider two more forms of the verb, the Progressive and the Repetitive. Divide the new forms into prefix plus stem.

gloss	Habitual	Potential	Future	Progressive	Repetitive
get dressed	raku	gaku	zaku	kayaku	wayaku
clean (field)	raana	gaana	zaana	kayaana	wayaana
receive (gift)	ra?de	ga?de	za?de	kaya?de	waya?de
drink	re?	ge?	ze?	kaye?	waye?
come	reeda	geeda	zeeda	kayeeda	wayeeda
eat	ro	go	zo	kayo	wayo
enjoy	ryaka	gyaka	zyaka	kayaka	wayaka
little	riwiini	giwiini	zawiini	kawiini	wawiini
answer	rikabi	gikabi	zakabi	kakabi	wakabi
worn out	ridubi	gidubi	zadubi	kadubi	wadubi
push	rila	gila	zala	kala	wala
lost	riniti	giniti	zaniti	kaniti	waniti
leave	riree	giree	zaree	karee	waree

5. Give a table with the allomorphs for all of the five prefixes so far, with scores.

gloss	Allomorphs	Score
Habitual		
Potential		
Future		
Progressive		
Repetitive		
Total prefix score		

Extend the table for allomorphs to include the new prefixes:

Prefix	Begins with consonant	Begins with vowel	Begins with glide
Habitual			
Potential			
Future			
Progressive			
Repetitive			

6. Consider the Unreal aspect. Divide them into prefix plus stem.

gloss	Habitual	Potential	Future	Progressive	Repetitive	Unreal
get dressed	raku	gaku	zaku	kayaku	wayaku	ñaku
clean (field)	raana	gaana	zaana	kayaana	wayaana	ñaana
receive (gift)	raʔde	gaʔde	zaʔde	kayaʔde	wayaʔde	ñaʔde
drink	reʔ	geʔ	zeʔ	kayeʔ	wayeʔ	ñeʔ
come	reeda	geeda	zeeda	kayeeda	wayeeda	ñeeda
eat	ro	go	zo	kayo	wayo	ño
enjoy	ryaka	gyaka	zyaka	kayaka	wayaka	ñaka
little	riwiini	giwiini	zawiini	kawiini	wawiini	niwiini
answer	rikabi	gikabi	zakabi	kakabi	wakabi	nikabi
worn out	ridubi	gidubi	zadubi	kadubi	wadubi	nidubi
push	rila	gila	zala	kala	wala	nila
lost	riniti	giniti	zaniti	kaniti	waniti	niniti
leave	riree	giree	zaree	karee	waree	niree

Now give a table with the allomorphs for all of the six prefixes so far, with scores.

gloss	Allomorphs	Score
Habitual		
Potential		
Future		
Progressive		
Repetitive		
Unreal		
Total prefix score		

Extend the table for allomorphs to include the new prefixes:

Prefix	Begins with consonant	Begins with vowel	Begins with glide
Habitual			
Potential			
Future			
Progressive			
Repetitive			
Unreal			

7. Consider now the Completive aspect. Divide these words into prefix + stem. Which cases are especially difficult to analyze, and why?

gloss	Habitual	Potential	Future	Progressive	Repetitive	Unreal	Completive
get dressed	raku	gaku	zaku	kayaku	wayaku	ñaku	guku
clean (field)	raana	gaana	zaana	kayaana	wayaana	ñaana	guuna
receive (gift)	raʔde	gaʔde	zaʔde	kayaʔde	wayaʔde	ñaʔde	guʔde
drink	reʔ	geʔ	zeʔ	kayeʔ	wayeʔ	ñeʔ	gweʔ
come	reeda	geeda	zeeda	kayeeda	wayeeda	ñeeda	beeda
eat	ro	go	zo	kayo	wayo	ño	gudo
enjoy	ryaka	gyaka	zyaka	kayaka	wayaka	ñaka	byaka
little	riwiini	giwiini	zawiini	kawiini	wawiini	niwiini	biwiini
answer	rikabi	gikabi	zakabi	kakabi	wakabi	nikabi	bikabi
worn out	ridubi	gidubi	zadubi	kadubi	wadubi	nidubi	bidubi
push	rila	gila	zala	kala	wala	nila	bila
lost	riniti	giniti	zaniti	kaniti	waniti	niniti	biniti
leave	riree	giree	zaree	karee	waree	niree	biree

8. Give the best statement you can for when the different allomorphs of the Completive prefix are used. (If you want to find a simple rule, you will be disappointed.)

8. Given this new data, the score for the stems will now increase. Give a total score for all the prefixes and stems.

gloss	Allomorphs	Score
get dressed		
clean (field)		
receive (gift)		
drink		
come		
eat		
enjoy		
little		
answer		
worn out		
push		
lost		
leave		
Stem score:		
Habitual		
Potential		
Progressive		
Future		
Repetitive		
Unreal		
Prefix score:		
Total		

18 Hungarian verb

Indefinite conjugation Some from http://www.unilang.org/wiki/index.php/Hungarian_verbs

remain		live		sit	
maradok	maradunk	élek	élünk	ülök	ülünk
maradsz	maradtok	élsz	élték	ülsz	ültek
marad	maradnak	él	élnek	ül	ülnek
live		ask		wait	
lakom	lakunk	kérek	kérünk	várom	várunk
laksz	laktok	kérsz	kérték	vársz	vártok
lakik	laknak	kér	kérnek	vár	várnak
work		step		stand	
dolgozom?	dolgozunk?	lépek	lépünk	állok	állunk
dolgoz?	dolgoztok?	lépsz	léptek	állsz	álltok
dolgozik	dolgoznak?	lép	lépnek	áll	állnak
wash		look for		eat	
mosom?	mosunk?	keresek	keresünk	eszem	eszünk
mosol	mostok?	keresel	kerestek	eszél	esztek
mos?	mosnak?	keres	keresnek	eszik	esznek
be cold		live		cook	
fázom	fázunk	élek	élünk	főzök	főzünk
fázol	fáztok	élsz	élték	főzöl	főztök
fázik	fáznak	él	élnek	főz	főznek
crawl		watch		shoot	
mászom	mázunk	nézek	nézünk	lövök	lövünk
mászol	máztok	nézel	néztek	lősz	lőttök
fm'aszik	máznak	néz	néznek	lő	lőnek
understand		spill		drink	
érték	értünk	öntök	öntünk	iszom	iszunk
értesz	értetek	öntés	öntötök	iszol	isztok
ért	ertenek	önt	öntenek	iszik	isznak

analyzed

remain		live		sit	
marad-ok	marad-unk	él-ek	él-ünk	ül-ök	ül-ünk
marad-sz	marad-tok	él-sz	él-tek	ül-sz	ül-tek
marad	marad-nak	él	él-nek	ül	ül-nek
live		ask		wait	
lak-om	lak-unk	kér-ek	kér-ünk	vár-ok	vár-unk
lak-sz	lak-tok	kér-sz	kér-tek	vár-sz	vár-tok
lak-ik	lak-nak	kér	kér-nek	vár	vár-nak
work		step		stand	
dolgoz-om?	dolgoz-unk?	lép-ek	lép-ünk	áll-ok	áll-unk
dolgoz-?	dolgoz-tok?	lép-sz	lép-tek	áll-sz	áll-tok
dolgoz-ik	dolgoz-nak?	lép	lép-nek	áll	áll-nak
wash		look for		eat	
mos-om?	mos-unk?	keres-ek	keres-ünk	esz-em	esz-ünk
mos-ol	mos-tok?	keres-el	keres-tek	esz-el	esz-tek
mos?	mos-nak?	keres	keres-nek	esz-ik	esz-nek
be cold		live		cook	
fáz-om	fáz-unk	él-ek	él-ünk	főz-ök	főz-ünk
fáz-ol	fáz-tok	él-sz	él-tek	főz-öl	főz-tök
fáz-ik	fáz-nak	él	él-nek	főz	főz-nek
crawl		watch		shoot	
mász-om	mász-unk	néz-ek	néz-ünk	lő-v-ök	lő-v-ünk
mász-ol	mász-tok	néz-sz	néz-tek	lő-sz	lő-t-tök
fm'asz-ik	mász-nak	néz	néz-nek	lő	lő-nek
understand		spill		drink	
ért-ek	ért-ünk	önt-ök	önt-ünk	isz-om	isz-unk
ért-esz	ért-e-tek	önt-ész	önt-ö-tök	isz-ol	isz-tok
ért	ért-e-nek	önt	önt-e-nek	isz-ik	isz-nak

Definite conjugations:

stand		stand def. obj.	
állok	állunk	állom	álljuk
állsz	álltok	állod	álljátok
áll	állnak	állja	állják
cook		cook def. obj.	
főzők	főzünk	főzöm	főzzük
főzöl	főztök	főzöd	főzitek
főz	főznek	főzi	főzik
watch		watch def. obj.	
nézek	nézünk	nézem	nézzük
népsz	néztök	nézed	nézitek
néz	néznek	nézi	nézik
live		live def. obj.	
élek	élünk	élem	éljük
élsz	éltök	éled	élitek
él	élnek	éli	élik
shoot		shoot def. obj.	
lővők	lövünk	lövöm	lövjük
lősz	lőttök	lövöd	lövitek
lő	lőnek	lővi	lővik
crawl		crawl def. obj.	
mászom	mázunk	mászom	másszuk
mászol	máztok	mászod	másszátok
m'aszik	máznak	fm'assza	mászák
eat		eat def obj.	
eszem	eszünk	eszem	esszük
eszél	esztök	eszéd	eszitek
eszik	esznek	eszi	eszik
understand		understand def. obj.	
értek	értünk	értem	értjük
értesz	értetek	érted	értitek
ért	értenek	érti	értik
step		step: def obj	
lépek	lépünk	lépem	lépjük
lépsz	léptök	léped	lépitek
lép	lépnek	lépi	lépik
spill		spill def. obj.	
öntök	öntünk	öntök	öntünk
öntész	öntötök	öntész	öntötök
önt	öntenek	önt	öntenek
drink		drink def obj.	
iszom	iszunk	iszom	isszuk
iszol	isztok	iszod	isszátok
iszik	isznak	issza	isszák