

INTRODUCTION TO MORPHOLOGY

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6 INFLECTION

Many approaches to morphology, both traditional and generative, draw a distinction between **derivation** and **inflection**. For the basic cases, there is general agreement on the classification, and the intuition behind it, but it turns out that there is somewhat of a fuzzy boundary between the two. In this chapter, we will make some initial observations on the basic properties of inflectional morphology and begin to develop an account of how we might incorporate these observations into our theory.

6.1 Derivation versus Inflection as Meaning versus Function

One fairly standard way of thinking about morphology divides morphemes into two types: derivational and inflectional. A common way of looking at this distinction is to say that derivation is about *meaning* (whatever that is)—derivational morphology *derives* new words by adding meaning to the stem. This contrasts with inflectional morphology, which is about *function*—the essential meaning of a word is left unchanged, inflectional morphology merely serves to signal the function of a word in the sentence. English does not have a particularly rich system of inflectional morphology, but there is enough to illustrate the basic idea.

Consider the pattern in (1a-d). All of the underlined words contain the morpheme *play* with an identifiable meaning (something like: whatever one does to CDs in order to hear the music on them). Indeed, we might call the underlined words “forms of the verb *play*”.

- (1) a. The DJ will play my favourite CD.
b. Nowadays, the DJ plays my favourite CD twice a day.
c. Last week, the DJ played my favourite CD.
d. The DJ is playing my favourite CD again.
e. *The DJ will played/plays/playing my favourite CD.

Note that the different contexts require specific forms; the forms can't be interchanged, as (e) illustrates (work through the other combinations). Note that schoolroom grammar has provided us with names for the forms such as the “bare infinitive” in (a), the “past tense form” in (c), the “present participle” in (d), etc. We may think of this in terms of the function of the inflectional

morphology: the affix *-s* (really /z/) is added to a verb to use it in the present tense with a third person subject, the affix *-ing* is added to a verb to use it in the progressive (with auxiliary *be*), and so on.

Now compare (1) with the examples in (2).

- (2) a.. I hope the DJ will replay my favourite CD.
 b. I hope the DJ will not overplay my favourite CD.
 c. This is a good CD-player.
 d. This CD is unplayable.

Like the “forms of the verb *play*” in (1), the words in (2) also contain the morpheme *play* (i.e., not just the sound, but also the meaning). But, here traditional grammar is not so obliging in the vocabulary it provides. What form of the verb *play* is *overplay*, or *unplayable*? Indeed, the words in (2c-d) aren’t even verbs at all! The words in (2) also differ from those in (1) in that the members of the same category are interchangeable. To see this, we can use the notion of a syntactic *frame* as we did in chapter ARG. The frame which diagnoses the bare infinitival form of a verb is given by leaving out the underlined verb in (1a), thus:

- (3) The DJ will _____ my favourite CD

The underlined verbs in (2a) and (2b) may be placed in this frame, yielding a predictable change in meaning, in part captured by our WSTs. In this sense, category-preserving derivational morphology yields interchangeable forms. This is distinct from inflectional morphology, which does not; substituting any of the other forms in (1) into (3) yields ungrammaticality.

These examples illustrate the intuitive distinction behind the derivational-inflectional distinction. The affixes in (1) are inflectional—they mark a word to fit some particular syntactic context. The affixes in (2) are derivational—when added to roots, they yield new words, with new meanings and sometimes a change of category.

Many languages have a richer inflectional system than English, for example Latin and Russian. In these languages, verb roots are bound roots (see Chapter 1). The list in (4) gives a selection of the forms of the verb meaning ‘read’. The root is easily identifiable as *čita-*, but this root alone is not acceptable as a word of Russian.

- (4) a. čita-tʲ ‘to read’ (infinitive)
 b. ja čita-ju ‘I read’ [1 sg, present]
 c. ty čita-ješ ‘you read’
 d. my čita-li ‘we read’ [past]

- e. čita-j ‘read !’ (imperative)

Russian speakers typically feel that the forms in (4) are all forms of the same verb, and they know which one is appropriate to any given context. Mixing and matching is impossible: *tyčitaju.

Russian also has derivational morphology, allowing new words to be created from the root *čita*, such as *čtenie* ‘reading’ (Noun), *pere-čita-tʹ* ‘to re-read’ (Verb), *za-čit-iva-tʹ-sʹja* (roughly) ‘to be absorbed in reading’ (Verb), etc.

Point of terminology: we have stuck to simple roots in our illustrations of inflectional morphology, but of course, complex verbs also inflect. In English, we talk of the verb *play*, but the proper analogue for Russian would be the verb stem *čita-*. Some linguists find it awkward to speak of “forms of the verb” in cases where the verb is not a word, but just a stem. For this reason, the term “**lexeme**” was introduced. A lexeme is the stem that is inflected, which may of course be internally complex. Thus, inflection marks a lexeme for a particular syntactic context, while derivation yields new lexemes from others. This terminology will not play a role in this chapter, but you should be aware of it in reading the literature.

Inflectional morphology then, is morphology that is added to a stem/lexeme to make that stem/lexeme usable in a particular context. The next section will provide a brief descriptive survey of some common types of inflectional morphology. This will introduce some terms and data that we will then use in subsequent discussion.

6.2 Common types of inflection

<Having a section of this sort:

pro – allows us to then use examples without having to stop and introduce terminology

con – slows the flow & distracts from theory with a number of “trivia” facts>

6.2.1 Nominal inflection

An important type of inflectional morphology on nouns is **number**. The basic division is, as in English, between singular (exactly one) and plural (greater than one). We will look closely at English plurals in section xx. below.

Some languages make further distinctions. Of these, the most common is the category of **dual**, meaning exactly two.

(5) DUAL

Some other number categories that are signaled in nominal morphology are trial and paucal (a few).

In addition to number, nominal morphology may signal **gender** or **noun class**. In an earlier chapter, we noted that the vowels at the ends of nouns in languages like Spanish and Italian bear some relation to the gender of the noun, as is especially clear in certain human-denoting nouns such as the following Italian nouns:

- (6) a. ragazza ragazzo
b. zia zio

Our principle of segmentation requires us to divide these words up into two morphemes, namely a bound root *ragazz-*, *zi-* followed by an inflectional morpheme that signals the gender of the noun. This latter is traditionally called the theme vowel. As we saw in Chapter D, this division was supported by Italian diminutive morphemes, which occur in between the root and the theme vowel, *ragazz-o* → *ragazz-in-o*

In Italian, the theme vowel does double duty in some measure, as it simultaneously signals both the gender and the number of the noun to which it attaches. Thus a fuller array of data is given in (7).

- (7) a. *ragazz-a-ragazz-e*; *ragazz-o-ragazz-i*

We can identify four basic vowels in Italian: -a = fem sg; -e = fem, pl; -o = masc sg; -i = masc. pl. (There are a number of deviations from this pattern, we will not consider them here.) Note that each one marks a combination of singular and plural, hence their meanings or functions are complex, but there is no further meaningful decomposition that can be done. In the realm of inflectional morphology, when a given affix signals more than one identifiable feature, this is referred to as **portmanteau** morphology or **cumulative exponence**. This will play an important role in our formal treatment of inflectional morphology to be developed below.

Italian has two genders: masculine and feminine. German has a third, as we saw in chapter D, namely neuter. Although there are some regularities, it is not the case that grammatical gender necessarily coincides with natural gender. For example, in Italian, a guard is *una guardia* (Feminine) whether a man or a woman, whereas an X is X (Masculine) regardless of natural gender.

Some languages make even more distinctions in noun classification than these three. Usually, when there are many distinctions, the distinctions are referred to as **noun classes**, rather than genders. The Bantu languages are well known for having a rich system of noun classes, as illustrated in (8).

- (8) a. NOUN CLASSES

Finally, in the realm of nominal inflection, it is common for languages of the world to mark **case** on nouns (and other elements of the noun phrase, such as determiners and adjectives). Case signals (to a first approximation) the grammatical function of a noun (phrase) in a clause, for example whether the noun functions as the subject, object, indirect object, etc.

We had a brief introduction to case morphology in our crash course in Japanese syntax in Chapter Arg. The highlights are repeated here:

(9) Japanese Case

To be used as the subject of a clause, a noun bears the suffix *-ga*. This is called Nominative.

To be used as the object of a clause, a noun bears the suffix *-o*. This is called Accusative.

To be used as an indirect object, a noun bears the suffix *-ni*. This is called Dative.

These functions are illustrated with the noun *sensei* ‘teacher’ in (10).

- (10) a. **Sensei-ga** sushi-otabe-ta
 teacher-NOM sushi-ACC eat-PAST
 ‘The teacher ate sushi.’
- b. Inu-ga **sensei-o** kan-da
 dog-NOM teacher-ACC bite-PAST
 ‘The dog bit the teacher.’
- c. Hanako-ga **sensei-ni** ringo-oage-ru
 Hanako-NOM teacher-DAT apple-ACC eat-PAST
 ‘Hanako is giving the teacher an apple.’

Although Old English had an intricate case system, modern English has only very little overt morphological case. Aside from the affix marking possessives (sometimes called the Genitive case) distinctions are only marked on personal pronouns:

- (11) a. I = Nominative; me = accusative
 b. He = Nominative; him = accusative
 etc.

Aside: Ergativity

Japanese, like Indo-European languages, divides its case-marking morphology along the lines of the major grammatical functions of subject and object. There is another pattern, which, though less common, is attested in a variety of languages from many different locations. This pattern is called an Ergative pattern, and is illustrated by the Inuktitut examples in (12).

- (12) a. Inuktitut.

Although case is a reflection of the syntax of the clause (nouns typically undergo case alternations in parallel with syntactic alternations, such as passive), it remains an open question whether the distinction between an Ergative case system and a Nominative case system reflects a difference in syntax, or only a difference in the way morphology reflects syntax.

A last feature of the nominal inflectional system which is worth pointing out is that inflectional features are often shared among the elements that go into a noun phrase (NP). Again, we may

illustrate with Russian, where the demonstrative, adjective and noun all bear inflectional marking for the case, number and gender of the entire NP.

- (13) a. et-a xoroš-aja knig-a ležit na stole
 that-NOM.SG.FEM good.NOM.SG.FEM book-NOM.SG.FEM lies on table
 ‘That good book is on the table.’
- b. Ja pročital et-u xoroš-uju knig-u.
 I read that-ACC.SG.FEM good.ACC.SG.FEM book-ACC.SG.FEM
 ‘I read that good book.’
- c. Ja pomogal et-im xoroš-im det^j-am.
 I helped those-PL.DAT good.PL.DAT kids-PL.DAT
 ‘I helped those good kids.’

This matching of features inside the NP is often called **concord** or **agreement**.

6.2.2 Verbal inflection

Agreement is also an important type of inflectional morphology in the verbal domain. The most typical type of agreement is subject-predicate agreement. Once again, English provides only a limited system, distinguishing in the present tense only between third person singular, and everything else:

- (14) a. He/she/it work-s.
 b. I/you/we/they work.

Many other languages show a richer contrast; for example, the Spanish agreement morphology was illustrated in chapter 1 in the discussion of bound morphemes:

(15) <Give full present tense paradigms>

a.	habl-ar	'to speak' (infinitive)	viv-ir	'to live' (infinitive)
b.	habl-o	'I speak'	viv-o	'I live'
	habl-as	'you speak'	viv-es	'you live'
	habl-ábamos	'we were speaking'	viv-íamos	'we were living'
	habl-aríamos	'If we spoke'	viv-iríamos	'If we lived'
	habl-a	'Speak!'	viv-e	'Live!'

Verbal agreement is not restricted to the subject (some languages also show agreement with the object, for instance) nor is it restricted to person and number-gender and noun class are also features which trigger agreement on the verb. Here is a particularly expansive case from Swahili:

(16) a. Subj-Tns-Obj-V Subj/Obj 1, 2, 3, class.

In addition to **agreement** common verbal inflectional morphology reflects the **tense**, **mood** and **aspect** of the clause.

Where subject agreement signals information about the subject of the clause (who performed the action), **tense** marks information about when the action occurred. There are three basic tenses, past, present and future. Of these, English marks only past versus non-past morphologically; the future is formed syntactically, by using an auxiliary element *will* (or *be going to*) along with an infinitive.

- (17) a. A few years ago, Mark work-ed at McGill. [past]
 b. Now, Mark work-s at Rutgers. [non-past, + 3 sg agreement]

It is worth pointing out that the familiar label of “present” for the non-past simple tense of English is inaccurate in various ways. For one thing, this grammatical tense has a number of uses which are not, strictly speaking, present, as in the *narrative past*, and *planned future* uses illustrated here:

- (18) a. So last night I go to this bar, and this guy walks up to me and says ...
 b. Tomorrow, we have an exam, and anyone who is late gets a zero.

In general there is little harm in using the more familiar term “present” for this tense, and we do so below, though the point comes up again in section xx.

Mood distinctions mark such contrasts as whether an action really happened (realis) or may not have happened but is being talked about, for example in a command, a conditional, or a counterfactual. In English, there is no morphology which is specifically mood morphology, but in some varieties of the language, mood affects the choice of tense morphology, for example as in *If I were to have done that...* compare: *I were ...

Aspectual distinctions include whether or not an action is completed (perfective versus imperfective), has a natural endpoint (telic versus atelic) and other distinctions. The perfect is an aspect, not a tense, and is signaled in English by the use of the auxiliary *have* as opposed to the simple past tense.

There is a great deal that can be said about the meanings of these inflectional categories, and many others, which we have not considered here. However, this could easily take up a book (or two!) on its own, and we will not delve into these meanings any more than we need to.

6.3 Formalizing inflection – Realization and Allomorphy

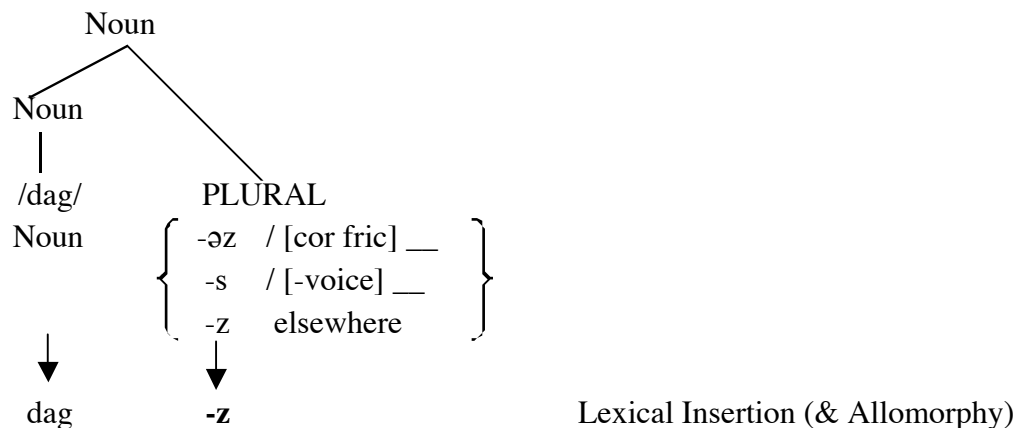
Any English singular count noun has a corresponding plural. The “regular” plural is signaled by the suffix “-s”, which we know to have three surface allomorphs, -əz, -s, and -z, conditioned by the phonological context. For purposes of exposition, let’s for the moment forget the fact that this is surface allomorphy (as opposed to true allomorphy) and set up a partial lexical entry as follows:

(19) English plural (preliminary)

label	PLURAL
phon / allom	$\left\{ \begin{array}{ll} -əz & / [\text{cor,fric}] __ \\ -s & / [-\text{voice}] __ \\ -z & \text{elsewhere} \end{array} \right\}$
attachment	[N $__$]

The derivation of a plural noun has two steps. First, the noun stem is combined with the abstract morpheme PLURAL, and then the proper allomorph for the phonological context is chosen. Formally, as discussed in Chapter 5, this is represented by a WST which represents the combination of (abstract) morphemes, which is followed by **lexical insertion**, inserting the correct allomorph at each terminal node (possibly cyclically). A derivation illustrating this is given in (20); see Chapter 5 for more detailed discussion of lexical insertion.

(20) English plurals



A useful way to think about allomorphy is that the various allomorphs *compete* to *realize* the abstract morpheme to which they belong. This competition is won by the allomorph that best fits the given context. In the case of (20), lexical insertion applies first to the root, inserting the UR /dag/. Since this ends in a voiced, non-coronal consonant, the first two allomorphs of the plural are not compatible with the context, and the elsewhere allomorph wins the competition. The correct plural form /dagz/ is therefore derived.

The productivity of English plural formation is captured by the WST which combines a PLURAL suffix with a noun root, and allomorphy then takes care of the rest. This works well for the “regular” plural and for novel words (cf. the Wug test), but now consider the singular-plural pairs given in (21) (we will treat ablauting and suppletive pairs, such as *goose~geese* and *person~people*, later on).

(21) Some “irregular” plurals

- | | | | |
|----|-------|-------|---------|
| a. | ox | oxen | *oxes |
| b. | fish | fish | *fishes |
| | sheep | sheep | *sheeps |

These fit the exceptionless pattern of English that every singular count noun has a corresponding plural, but the surface form of the plural is unexpected from the perspective of (20). In (21a), there is an unexpected suffix, *-en*, for which there is no phonological motivation (cf. *foxes*, *axes*) while in (21b) there is no plural suffix at all. It is important to note that the plural *fish* and *sheep* are syntactically plural forms, corresponding to the (phonologically identical) singulars. It would be wrong to say that *fish* and *sheep* do not have plural forms (say, like mass nouns such as *health* or *air*). Unlike mass nouns, the plural *fish* and *sheep* are compatible with syntactic contexts that require a plural subject. The example in (22) shows this—the plural form of the auxiliary and the reciprocal expression *each other* both require a plural subject.

(22) *The fish are looking at each other.*

As indicated in (21), for nouns with “irregular” plural forms, the regular suffix cannot normally be used. Such **blocking** of regular morphology by irregular morphology is a systematic character of inflection and needs to be captured within any framework.

Fortunately, by separating the formal combination of a noun root with a plural morpheme from the realization of that morpheme, as in (20), we can simultaneously capture both the productive nature of plural formation and the blocking effect of irregular plurals. To do so, we need only add some *lexically conditioned* allomorphs to the lexical entry we have set up in (19), for example, as in (23).

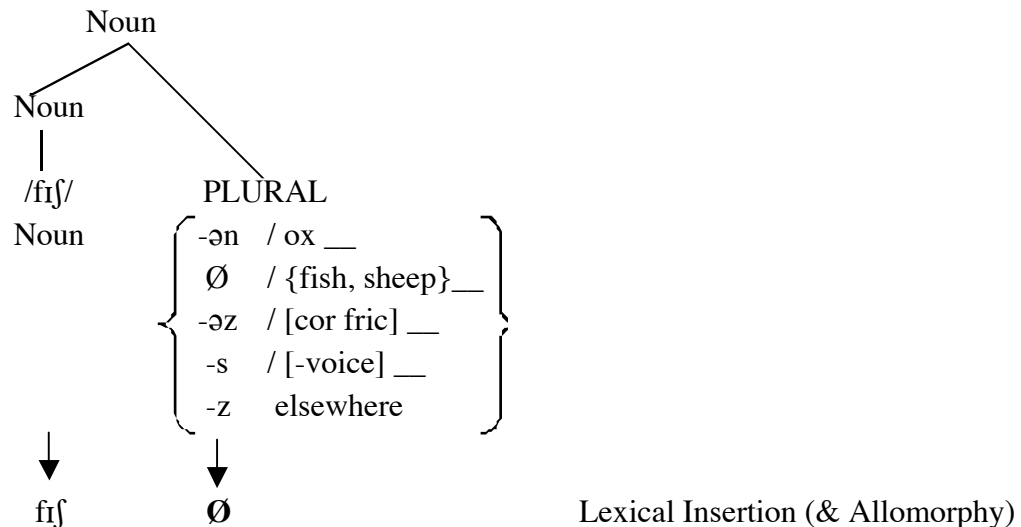
(23) English plural (version 2 of 3)

label	PLURAL
allomorphy	$\left\{ \begin{array}{l} -\text{ən} \ / \ \text{ox} \ __ \\ \emptyset \ / \ \{\text{fish, sheep}\} \ __ \\ -\text{əz} \ / \ [\text{cor,fric}] \ __ \\ -\text{s} \ / \ [-\text{voice}] \ __ \\ -\text{z} \ \text{elsewhere} \end{array} \right\}$
attachment	[N $__$]

This way of formalizing inflection treats blocking as simply a special case of the competition in lexical insertion that we have used already. The fact that all count nouns have plural forms is expressed by the WST which combines a noun root with the plural morpheme. Listing the lexically conditioned allomorphs of this morpheme first in the disjunctive list captures the fact that these will win out over the “regular” allomorphs. The derivation of plural *fish* is given in (24) below, compare this to (20) above (which should of course be modified to include the two additional allomorphs of plural we have just seen).

Note the use of the null symbol ($\emptyset$) here, also called a “zero allomorph”. This symbol indicates that when lexical insertion applies, no phonological material is added. The zero allomorph is important, since it occurs higher in the disjunctive list of allomorphs, and thus blocks the “regular” suffix. If the line with the zero allomorphs were omitted from (23), the plural of *fish* would be **fiʃəz*.

(24) English plurals



Theories of morphology which treat inflection as allomorphy in this way are sometimes called *realizational* theories. This is because the inflectional allomorphs do not introduce features into the WSTs; instead, the allomorphs *realize*, in the sense of providing phonological content to, the

features that are present in the WST. Some researchers refer to the allomorphs as *exponents*, a term you should be familiar with in reading other literature, though we will not use it here.

6.4 Inflectional Allomorphy – Theme Vowels and Contexts

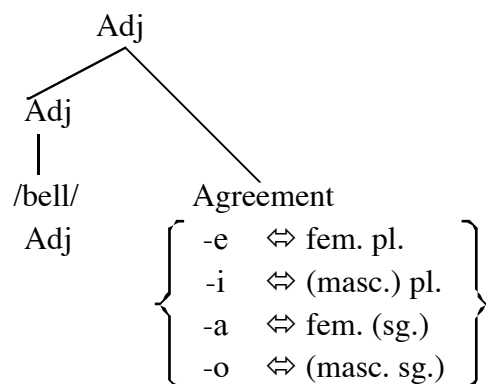
In previous chapters, we put aside inflectional morphemes in discussing some data, for example, the final vowels of nouns and adjectives in Italian. It's time to return to those topics now and to consider how our realizational treatment of inflectional morphology will handle them.

Let's start with the Italian adjectives we looked at in Chapter 2. We repeat the basic paradigm in (25). *Note phonological complications, $V \rightarrow \emptyset / __V$, thus *un bel uomo* 'a beautiful man', also, lexically restricted $l \rightarrow \emptyset / __i$ hence m. pl. *bei* except before 'impure' consonants and clusters. thus *i belli studenti* versus *i bei libri*. (See Hall, pp.20-22). Replace with a cleaner example.*

(25) sg.	bella	'beautiful' (fem)	stupida	'stupid' (fem)
	bello	'beautiful' (masc)	stupido	'stupid' (masc)
pl.	belle	'beautiful' (fem)	stupide	'stupid' (fem)
	belli	'beautiful' (masc)	stupidi	'stupid' (masc)

Basic segmentation led us to separate the roots from the final vowels, which was confirmed by the possibility of inserting superlative suffixes between the root and the final vowel, as in *bell-issim-o* 'very beautiful'. Our realizational approach to inflection now allows us to posit a consistent structure for all Italian adjectives by positing a single inflectional suffix, to which we will assign the label "Agreement" with four allomorphs, corresponding to each of the vowels. A WST for an Italian expressing this is given in (26). Note that we've used the symbol $\Leftrightarrow$ instead of the familiar "/" for the contexts. For now, this can be thought of as a convention for indicating that the following context is syntactic rather than phonological or lexical. We'll explore this in more detail below. Note also that the features in parentheses are redundant, given the ordering of the allomorphs in the disjunctive list. We will return to this aspect of the theory in a later section.

(26) Italian adjectives



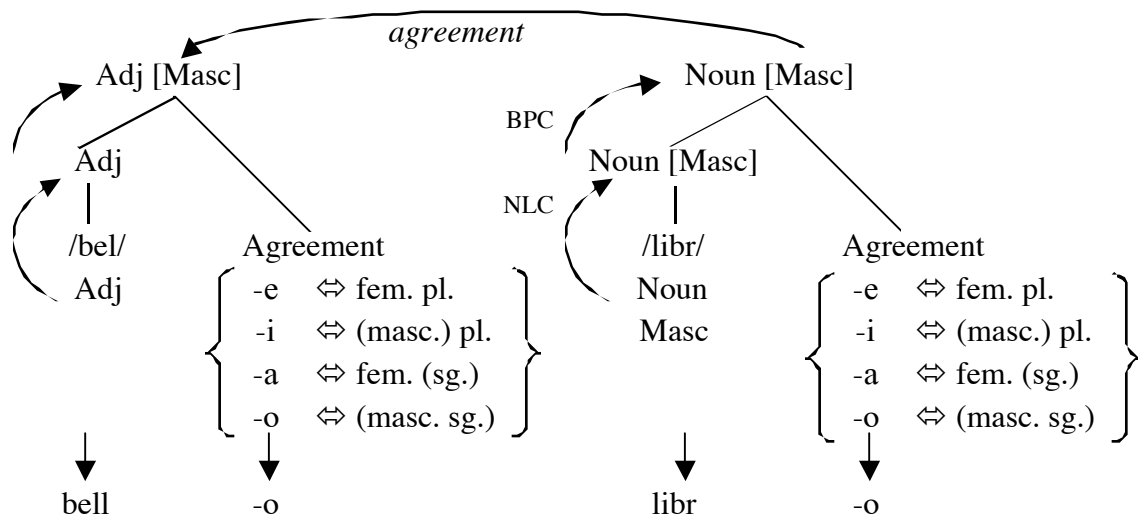
Let's now look a little more closely at the agreement suffix. Just how does lexical insertion apply in (26)? Unlike the English plural, the WST in (26) does not in fact provide sufficient information to determine the choice of theme vowel. This is because adjectives show *agreement*

with the noun they modify. This means that the gender and number features which determine the choice of allomorph come from the **grammatical** (or syntactic) **context** in which the adjective occurs. If (26) modifies a feminine plural noun, then the context will trigger the insertion of the vowel *-e*, as in *belle scatole* ‘pretty boxes’. If the grammatical context requires masculine singular, then the vowel *-o* will be inserted, as in *bello libro* ‘pretty book’. Since the choice of allomorph requires information about grammatical context, we refer to such allomorphy as *contextual allomorphy*, and use the special symbol $\Leftrightarrow$ to indicate this.

The grammatical contexts in which agreement occurs vary to some degree from language to language. In languages like Italian, Russian and German, an adjective which modifies a noun typically agrees with that noun in gender, number and case (in Russian and German). These languages differ regarding the form of adjectives in predicative position, as, for example, in a sentence like *The doctor is tall*. In Italian [check] the predicative adjective agrees with the subject noun in the same way as an adjective in modifier position would. In German, predicative adjectives never show agreement. In Russian, predicative adjectives agree, but with certain subtle difference, for example, distinguishing between natural and grammatical gender. Differences in the contexts for allomorphy are the subject of syntax, and we will not investigate these contexts or their variation in any detail here. Let’s presume that our syntacticians-colleagues have done that work for us, and we will simply state the relevant contexts for the examples we discuss in quite informal terms.

Note, though, that the contextual information does not occur (yet) anywhere in the representation in (26). In order to be fully explicit, we will add contextual information to the top node of the tree. Keep in mind that this information comes from agreement with another element in an appropriate syntactic configuration and is not percolated from within the adjective itself (though the category feature *Adj* percolates in the normal way). This is illustrated in (27). One can think of agreement as feature copying, where the features of the *controller* (in this case the noun) are copied to the topmost node of the *target* (here, the target is the adjective). To be explicit, we’ve given some internal structure to the WST of the noun governing agreement; we will return to the agreement in the noun presently. The feature copying is not necessary, but it is a convenient means of representing the information about context in our WSTs. Note also, that we can then read the symbol $\Leftrightarrow$ as “when dominated by”.

(27) Agreement in Italian adjectives as contextual allomorphy



Exercise. Using (27) as a model, draw the derivation for *bellissima scatola* ‘very pretty little box’. Indicate the flow of information of the category and gender features, labeling all arrows with the appropriate percolation conventions or as agreement.

Adjectives have no inherent gender and number features, yet in the appropriate syntactic environments, they surface with a final vowel that agrees with the modified noun. The WST in (26) represents the general structure of Italian adjectives, and the diagram in (27) is a formal representation of how adjectival agreement works, one that meshes quite nicely with the treatment of inflectional morphology as allomorphy that we posited on the basis of English plurals. Let’s now look a little more closely at the agreement morphology we have posited on the Italian nouns.

6.4.1 Nominal inflection in Italian

In Chapter D, we observed that segmentation yields a bi-morphemic analysis for nouns as well as adjectives. Indeed, the majority of Italian nouns show the same theme vowel pairs as the adjectives. This is illustrated in (28), along with the corresponding diminutives that confirm the segmentation (see chapter 2, section xx).

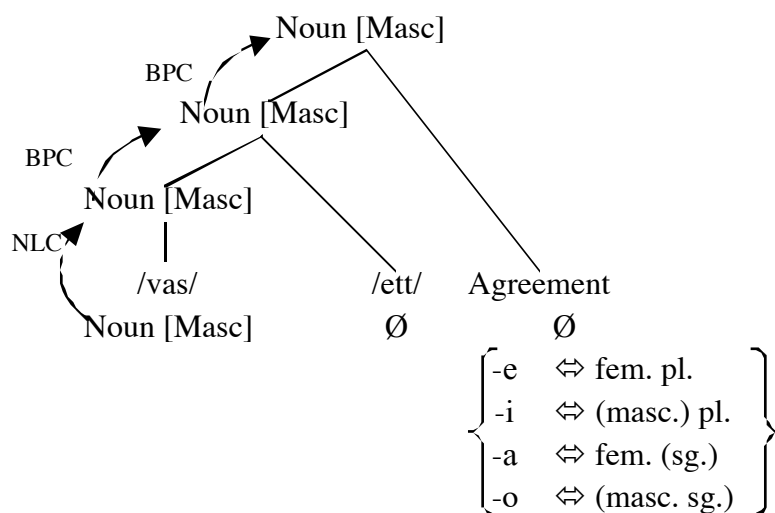
(28) Italian nouns and diminutives:

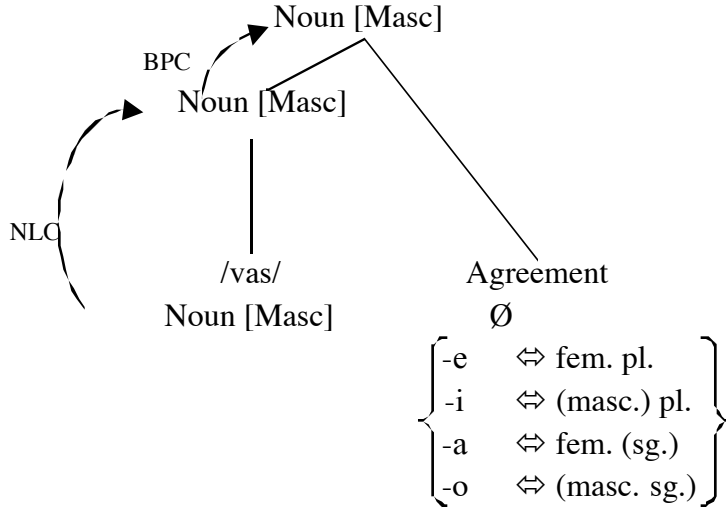
scatol-a	‘box’ (fem)	scatol-ett-a	‘little box’ (fem)
camici-a	‘shirt’ (fem)	camici-ett-a	‘little shirt’ (fem)
libr-o	‘book’ (masc)	libr-ett-o	‘little book’ (masc)
libr-i	‘books’ (masc)	libr-ett-i	‘little books’ (masc)
vas-o	‘vase’ (masc)	vas-ett-o	‘little vase’ (masc)
vas-i	‘vases’ (masc)	vas-ett-i	‘little vases’ (masc)

On the basis of such examples, we concluded that gender in Italian nouns is a property of the root (it is unpredictable, and thus must be learned = listed in the lexical entry of the root). The diminutives show that gender percolates by the BPC (along with the category feature). We may

now combine our understanding of percolation of gender features with the treatment of inflection as contextual allomorphy that we have from the adjectives. For a word like *vasetto* ‘little vase’ this yields the derivation in (29a), where the feature [Masc] at the top node is ultimately from the noun root, brought up by the NLC and then two applications of the BPC. The simpler noun *vaso* has the derivation given in (29b). The WST itself is exactly as it was in Chapter 2, nothing new is added here. Lexical insertion and allomorphy for the inflectional ending works exactly as the allomorphy did in the adjectival inflection in (27)—the correct allomorph is chosen according to the features that dominate the terminal node. The difference between nouns and adjectives comes from the source of the inflectional features (i.e., the correct formulation of the grammatical context)—in nouns, the information is percolated upwards from the root, while in adjectives, the feature is contributed by agreement. On a final technical note, recall that the BPC only allows features to percolate from a non-head when the head has no features to contribute. On these grounds, we determined that the diminutive suffix *-ett* had no features (indicated by a zero in the lexical entry). We must therefore assume that the Agreement suffix also has no inherent features.

(29) a. *vasetto*



b. *vaso*

Summary. This concludes our main discussion of Italian and illustrates how the treatment of inflectional morphology as allomorphy fits within the framework we have developed. We have assumed that inflectional morphology does not contribute inflectional features, but rather realizes, or spells out, features which are present in the derivation already. For Italian adjectives, these features come from the noun, via agreement. Internal to nouns, these features are contributed by the noun root in the normal case. In section XX, we will explore the formulation of the lists of allomorphs in closer detail, and in particular the notion of underspecification and elsewhere cases. Before doing so, we include a brief aside which pushes our treatment of Italian inflection somewhat further, introducing one further concept which we will make use of later.

6.4.2 More on Italian nominal inflection

In the preceding section, we concluded that the theme vowels on Italian nouns, just like those on Italian adjectives, reflect gender features that originate elsewhere. In the case of adjectives, the gender features originate on the noun, and internal to nouns, the gender features originate on the roots. We formalized these observations in terms of feature copying and feature percolation, treating the formal representation of contextual allomorphy as domination.

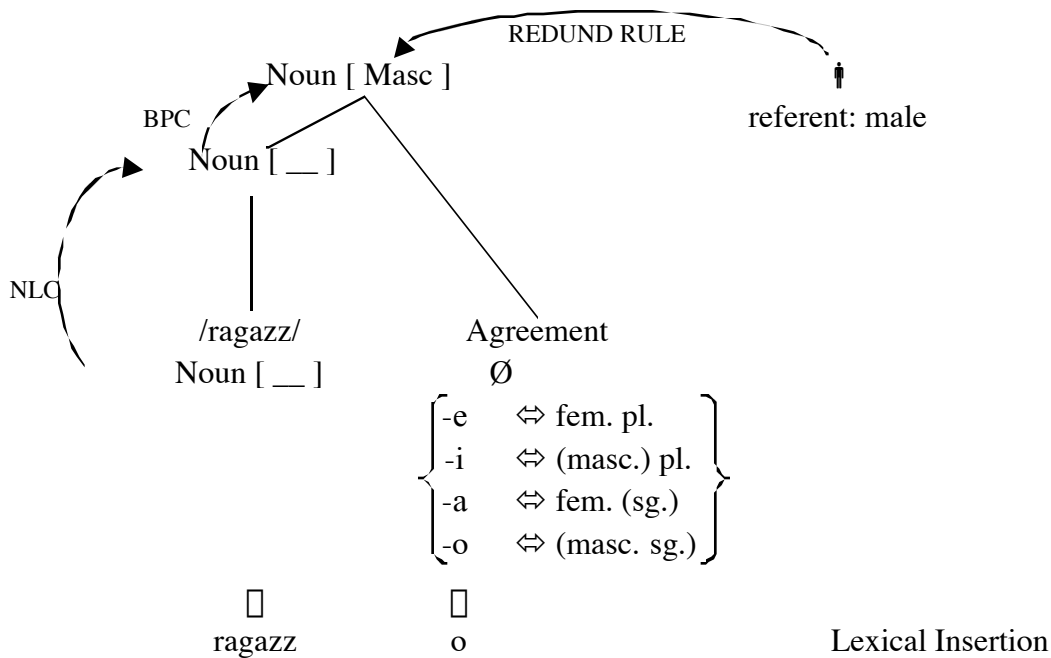
The nouns we have discussed thus far have fixed gender. The root *libr-* meaning ‘book’ is associated with masculine gender as part of its lexical entry, and hence surfaces with the theme vowel *-o*, even if other suffixes (with no gender of their own) intervene. We have avoided until now discussing Italian nouns roots which may occur in either gender. Some examples, repeated from chapter 2, are given in (30).

(30) sg.	ragazza ‘girl’ (fem)	zia	‘aunt’ (fem)
	ragazzo ‘boy’ (masc)	zio	‘uncle’ (masc)
pl.	ragazze ‘girls’ (fem)	zie	‘aunt’ (fem)
	ragazzi ‘boys’ (masc)	zii	‘uncle’ (masc)

Our principles of segmentation thus lead us to conclude that these nouns are bi-morphemic, and that there are bound roots, *ragazz-* ‘young person’ and *zi-* ‘sibling of parent’. It is important to note that the fact that we do not have a single word for the meaning of the Italian root *zi-* does not prevent us from positing this root, nor from assigning a meaning to it.

But how do we deal, formally, with the gender here? It looks tempting to suggest that the gender here, e.g., the difference in meaning between ‘aunt’ and ‘uncle’ comes from the vowel itself. But that would undermine the treatment of inflection above. That treatment worked precisely by **not** assuming that the vowels bare meaning, but instead that they reflect meaning in a particular configuration. We could get by with positing homophony, e.g., two distinct roots, *zi*₋₁ ‘uncle’ [Masc] and *zi*₋₂ ‘aunt’ [Fem], but this is undesirable for a number of reasons. Among the problems this raises, because it treats the resemblance between *zio* and *zia* as accidental homophony among roots, it means that the Italian learner who knows the word *zio* will not be able to predict or understand on first hearing the word *zia*. This seems unlikely, and is thus a potentially problematic result for the homophony approach.

It turns out that all noun roots which productively alternate in the manner of (30) refer to animate beings, specifically, humans and some animals (dogs and cats, for instance). In these alternating cases, the source for the gender feature, indicated by the vowel, is always the *natural gender* of the referent of the noun. We may think of this as a process like agreement which supplies a gender feature to the topmost node in a WST, and thus provides the appropriate context for grammatical insertion. The technical term for such a process is a **redundancy rule**, which supplies grammatical features that are predictable on the basis of other features. For this to work, we will want to say that the alternating roots do not have a gender feature in their lexical entry. Since they lack such a feature in their lexical entry, percolation does not supply any feature to the topmost node, and the redundancy rule applies. This is illustrated in (31).

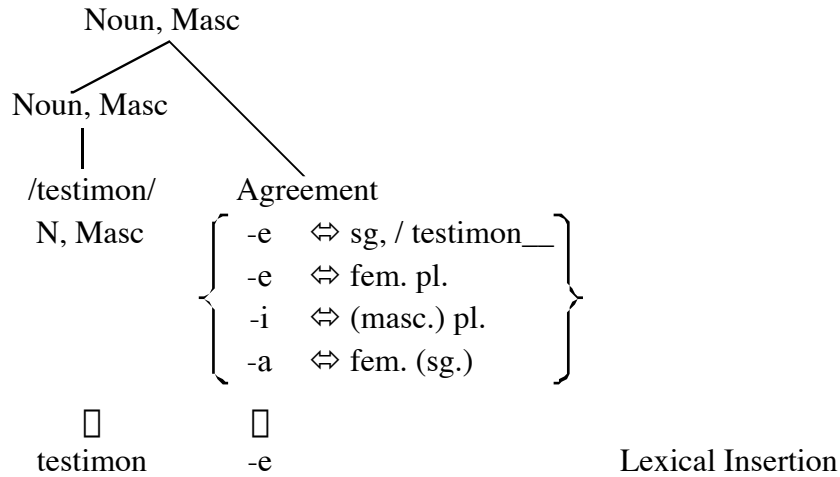
(31) *il ragazzo*

Some nouns refer to humans, but have fixed gender. E.g., *una pilot-a*. The percolation conventions apply first. If the root has a gender feature, this feature will always supply the topmost node with a gender feature, determining the final vowel and preventing the redundancy rule from applying.

6.4.3 A last note on Italian nominal inflection

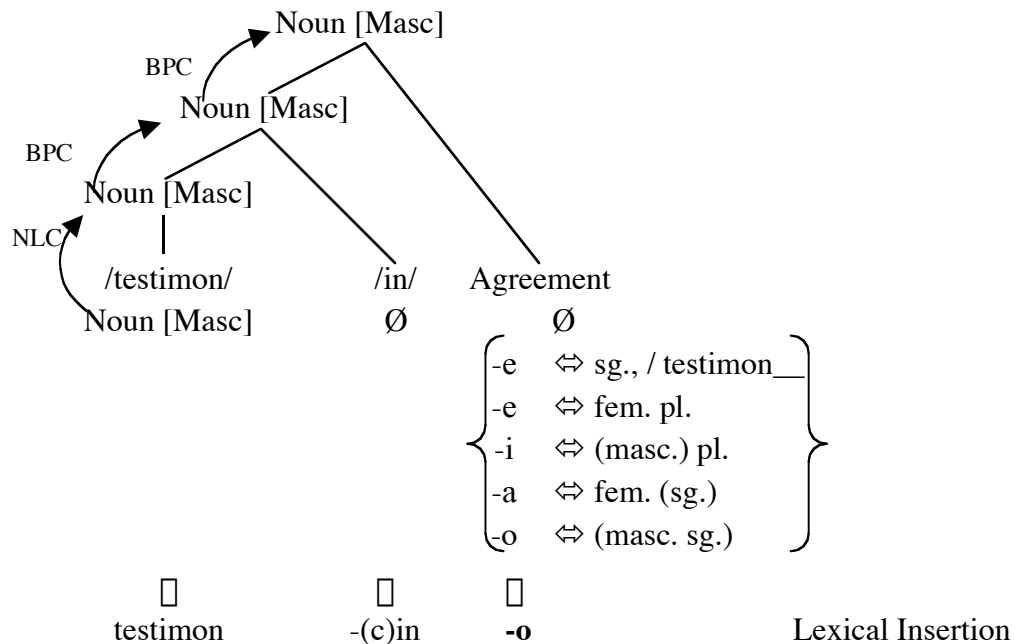
XX Substitute a better noun. Testimone (i) alternates, (ii) triggers a different dimin.: *testimoncino* ? ...on+in-o = ončino by rule (Dressler & Barbaresi p.94). Use *il duca* → *il ducino*; pl. *i duchi*.

There are many Italian nouns which do not end in the expected vowels for their genders in the singular. For example: *il testimon-e* (masc.). The formal treatment of such nouns combines aspects of everything we have seen above. Specifically, we must expand the list of allomorphs for the theme vowel to include these special cases, just as we expanded the list of plural allomorphs in English to include the special cases like *ox-en*. And, just like *ox-en*, we can do this by adding some allomorphs to the list with lexically conditioned environments. We may also include a zero allomorph to capture nouns which either end in a consonant *tunel* or appear not to decline *cità*. (A more efficient list might use diacritics, rather than lexical lists; on diacritics, see below.) We illustrate a partially expanded list with the derivation of the masculine nouns *testimon-e* in (32); the lexically conditioned allomorph occurs at the top of the list and blocks the regular gender suffixes.

(32) *il testimone*

Treating nouns like *testimone* in this way may look slightly cumbersome, but it makes a curious prediction which we can test. Consider what happens in forming the diminutive. The tree is given in (33).

(33)



The Italian diminutive is transparent to gender (and indeed to category, as we saw in chapter 2). This is formally represented via the BPC. This means that the diminutive of a masculine noun will be a masculine noun. This much is correct, as indicated by the choice of the theme vowel *-o* in (33). But this is not the theme vowel that the root takes when used on its own. Our theory predicts this. Look carefully at the statement of the allomorphy in (33). The lexically conditioned

allomorph *-e* is triggered by being attached to (i.e., being the sister to) the noun root *testimon*. That condition is satisfied in (32) but not (33), since the diminutive suffix intervenes.

The way we have chosen to formulate the system above has this curious result. Although Italian diminutives are invisible to all grammatical features (they will percolate through), the diminutive suffix should bleed the environment for lexically conditioned allomorphs that are conditioned by the root. Diminutives should therefore always default to the regular theme vowel for their gender and number. For Italian this surprising prediction is essentially correct. Pre-theoretically, this would have been a surprising prediction to make. Since the criteria for falsification are clear, this counts as an interesting prediction of the theory. If Italian did preserve the quirky vowels under diminutive formation, along with all other features, the specific combination of assumptions that go into making the predictions illustrated in (33) could not all have been right and the theory would have been in need of modification. It is important to keep in mind that a false prediction only means that at least one assumption is incorrect, it never does not mean that the entire theory is incorrect. Much work in linguistics as in other sciences involves being faced with knowing that a complex theory derives an apparently false prediction, but not knowing which of the assumptions is incorrect. Sorting this out is a painstaking and careful process.

6.4.4 *Taking stock*

Main Points xxx

6.5 Verbal Inflection

We turn now to some more explorations of inflectional morphology. The starting point which led us to a realizational theory of inflection, one based on the formal tool of a disjunctively ordered list, was the observation that there is a relationship of competition (blocking) between irregular and regular plural forms in English. Similar observations hold for verbal inflection. The issues are basically the same, although some of the technical details are a little more complex than the plurals.

6.5.1 *Regular English inflection*

Let's start by limiting our data set to the regular, weak verbs of English and further limit the discussion to simple tenses (those that occur with no auxiliary verb). Descriptively, these show a three-way contrast with two suffixed forms and one form that has no affix as illustrated in (34).

- (34) a. I / you / she / they worked in Vienna last year. [past] [any subject]
 b. She / he works in New Brunswick now. [non-past] [3 SG subject]
 c. I / you / we / they work in Montréal now. [non-past] [other subject]

We may describe the distribution of the three forms as follows. (For convenience, we use the familiar orthographic labels for the affixes for the moment; on the present as “non-past” see the discussion at (18), above.)

(35) Inflectional Forms:

- a. The suffix “-ed” occurs on the verb when the clause is in the past tense (34a),
- b. The suffix “-s” occurs on the verb when the clause is in the present tense (=not in the past tense) and has a third person singular subject (34b),
- c. The bare form is used when the clause is in the present tense (=not in the past tense) and the subject is not third person singular (34c).

Our task is now to formalize this description within the theoretical framework that we have been developing. We will do this step by step, providing a motivation at each stage. This may seem cumbersome, and in later parts of the chapter, we will take shortcuts in the notation, but it is important at this point to be as explicit as possible.

6.5.2 Inflection and elsewhere distribution

The first thing to notice about the distribution of the inflectional forms described in (35) is that it includes some negative conditions. The distribution of the bare form in particular is best described by the negative condition “not third person singular”. (A positive condition would have to involve a list including a disjunction, such as “first **or** second person, singular, **or** any plural subject”; the occurrences of “or” in this statement is equivalent to positing homophony and is thus to be avoided.) Notice in particular that the two negative conditions which describe the distribution of the bare form happen to be exactly the same as the conditions which specify the contexts for the other two forms. The bare form occurs when (i) the clause is not in the past tense—the past tense triggers the appearance of the “-ed” suffix and (ii) when the subject is not third person singular—exactly the feature combination which conditions the “-s” suffix. In other words, the bare form is an elsewhere form, occurring everywhere where there is no more specific suffix.

We have seen such **elsewhere** distribution before, specifically in the discussion of allomorphy in chapters BC and 5, and so we know how to formalize an elsewhere distribution. For the sake of practice, let’s re-consider one case we had seen above, specifically the phonologically conditioned surface allomorphy in the English “-s” suffixes (plural, possessive, 3 sg. verbal inflection, etc.). One could begin by writing an explicit description for each allomorph, as follows:

(36) English “s” surface allomorphy.

- a. [əz] following a coronal fricative
- b. [s] when **not** following a coronal fricative
but following a voiceless consonant
- c. [z] when **not** following a coronal fricative
and **not** following a voiceless consonant

Such a description is accurate, but the complementary distribution of the allomorphs arises as a conspiracy of sorts, since the not clauses on the b and c cases correspond exactly to the positive specifications of the other allomorphs. As we have seen in previous chapters, allomorphy is better rendered as a disjunctively ordered list, a statement of the allomorphy involved, as in (37).

(37) Allomorphs of “s” as a disjunctive list

- a. əz / [cor,fric] __
- b. s / [-voice] __
- c. z / elsewhere

The same considerations apply to the description of the distribution of inflectional endings in English in (35). It too is thus readily translated into a disjunctive list, as in (38). Note also that by listing the past suffix first, the non-past nature of the remaining forms follows automatically, we need not call them present tense forms explicitly, and hence we capture the past versus non-past nature of these forms discussed above. Note that we are again using a Ø allomorph to represent the bare form and the symbol ⇔ to indicate grammatically conditioned allomorphy.

(38) Infl (English)

- a. -ed ⇔ past
- b. -s ⇔ 3 sg
- c. Ø ⇔ elsewhere

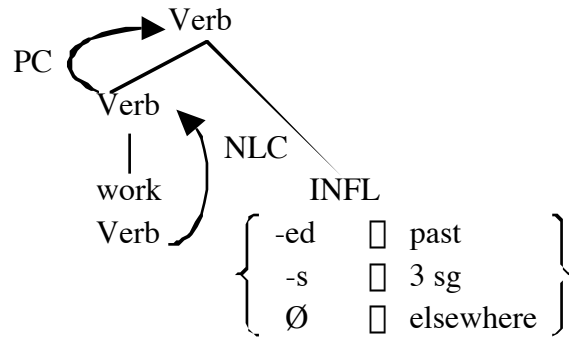
Let’s take stock. The elsewhere nature of the bare form of the verb in English has led us to use the formal device of a disjunctively ordered list to analyze English inflection. In other words, (38) quite explicitly treats the pieces “-ed”, “-s” and Ø not as separate morphemes but of allomorphs of a single abstract morpheme. This implies a lexical entry like the following. Note that this morpheme does not contribute grammatical features, but, as with inflectional allomorphy generally, reflects features contributed by the grammatical context.

(39) Lexical Entry for English Inflection (I)

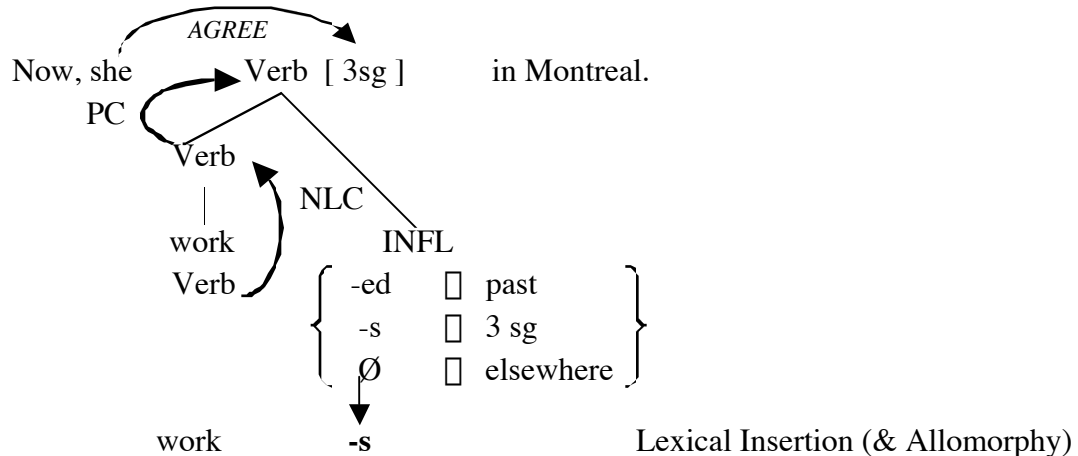
label	Infl
phon / allom	$\left\{ \begin{array}{l} \text{-ed} \quad \square \quad \text{past} \\ \text{-s} \quad \square \quad \text{3 sg} \\ \text{Ø} \quad \square \quad \text{elsewhere} \end{array} \right\}$
meaning	
attachment	[V __]
features	Ø

Now we may formalize the derivations of English verbs. First, there must be a WST that concatenates the verb root and the abstract suffix Infl, identified in (39). Such a tree will look like the following. Note in particular that we are treating Infl as a modification structure, i.e., having no features of its own, just as we did with the Italian theme vowels above.

(40) WST for an inflected verb



The next step is to apply lexical insertion to the terminal nodes of the WST in (40). This is trivial for the verb root, as *work* has no allomorphy. But what of the Infl node? The choice of allomorph is determined by the grammatical context in which the word occurs. Importantly, this context is determined by the *syntax*. We can sketch a non-past context first. If (40) is placed in the context with a 3 sg subject, then agreement (here represented again as feature copying) supplies the contextual features [3 sg], which in turn condition the insertion of the inflectional allomorph *-s*, as shown in (41).

(41) Now she works in Montreal.

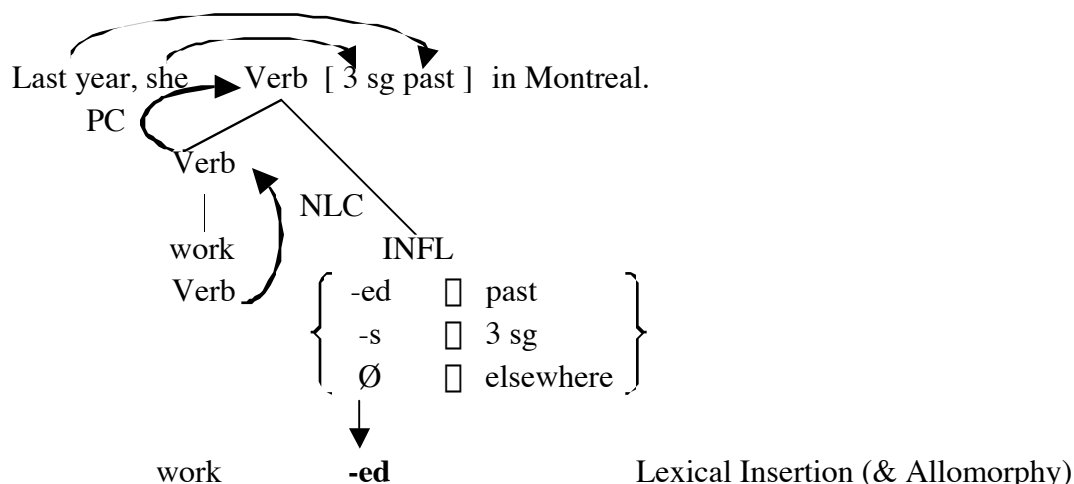
With a subject other than 3 singular, agreement likewise supplies the contextual features that determine allomorphy, but in such cases the elsewhere, zero allomorph is chosen as the best fit.

As above, this treatment is realizational. Indeed, the representation of inflection as an allomorphy as in (39) commits us to a realizational approach. In any statement of allomorphy, the conditioning environment—whether phonological or syntactic—must be determined independent of the choice of allomorph. That is, in order to say that “*-s*” is chosen “in the context of a 3 sg subject”, there must be some way of formally determining that there is a 3 sg subject.

Without further modification, this theory also commits us to saying that tense is a property of the syntax (e.g., the clause). That is, the WST and derivation for the form *worked* must be as in (42).

The feature [PAST] must come from the grammatical context and not from the inflectional allomorph *-ed*. Note that (42) makes use of the same WST as (40), the choice of allomorph is represented only at the point of lexical insertion.

(42) Last year she worked in Montreal.



In this tree, we have indicated the source of the past tense feature as the past tense adverbial expression *last year*. Of course, not all sentences come with adverbs explicitly indicating the time reference. In these cases, we must assume that the tense of the clause is nevertheless a part of the representation, for example, by means of a silent **tense operator**, which one might think of as an implicit adverbial expression. Alternatively, one could simply add the feature at the top of the tree directly, similar to the way we used a redundancy rule in section xx above, allowing the feature to trigger the allomorphy in the normal way. Ultimately, since tense has both syntactic and semantic aspects, the choice will be dictated in part by the syntactic or semantic theory one adopts. Different theories of semantics and syntax have different ways of encoding tense, but the important point to be made for our purposes is that, for a realizational theory, the inflectional allomorphs do not add features, they reflect features that are already there (no matter how they actually get there).

Practice: Draw the derivations from WST to Lexical Insertion for the inflected verb in each of the following sentences.

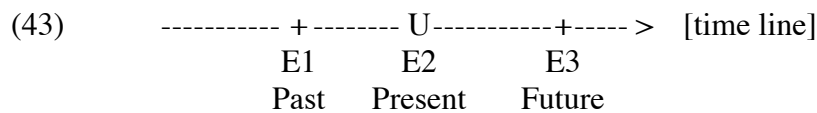
- a. Once upon a time we lived in Boston.
- b. Now we live in different cities.
- c. We played hockey when we were young.
- d. She plays hockey every Monday.

6.5.2.1 Tidbit... tense agreement

Incidentally, treating tense in this way leads us to the expectation that we might find morphological agreement in tense across languages, that is, contexts in which grammatical

conditions impose an agreement relation which is not strictly interpreted. The sequence of tense phenomenon in English and other languages is often analyzed along these lines. Here is a brief overview.

The most influential way of thinking about the semantics of tense originates with the proposals of H. Reichenbach in the 1940s. Initially, one might be tempted to think of tense as expressing a relationship between points on a time line, as in (43). In this diagram U stands for the time of the utterance (sometimes given as *S* = speech time), and E1...E3 stand for three events one might want to describe. The appropriate tenses are indicated beneath the events. Something that happens before the utterance is described in the past tense (I walked to school), something that happens at the same time as the utterance is described in the present tense (I know German), and so on.



Reichenbach argued that this two-part system is insufficient, and that the semantics of tense in more complex cases must also include a reference time. In simple tenses, the reference time is identified with the time of the event, but the reference time comes into use in, for example the compound tenses such as the present and past perfect, illustrated here.

- (44) a. Uncle Max has arrived.
 b. Uncle Max had arrived by the time I did.
 c. Max will have finished the assignment by tomorrow.

In Reichenbach's analysis, the reference time in (44b) is the time I arrived. This reference point is before the utterance time (we formalize this as: $R > U$), and the sentence asserts that the event described (Max's arrival) is in turn before the Reference time ($E > R > U$). Compare a sentence like *Max arrived and I arrived*. This sentence identifies two events in the past tense, but does not provide any ordering among them. Reichenbach's analysis also explains the use of past tense morphology in (44c); the event (finished assignment) is in the past relative to the reference time (tomorrow), even though the ordering with respect to the utterance time may be future ($U > E > R$).

The semantics of tense is assumed to be universal, although its expression varies across languages. Some languages lack morphological categories expressing some (or many) of the simple tense notions in English (and others make finer distinctions) but there is no evidence to suggest that people are restricted in their conceptions of temporal ordering by the morphological ordering. (Many languages distinguish between recent and distant past, a distinction English does not mark morphologically, yet it is not hard to make the conceptual distinction between events that happened recently and distant memories from one's childhood.)

Now, consider the following scenario. At a party last night, Peter left the room abruptly while talking to me. It turned out that he had heard something in the next room, and the thought

occurred to him “Mike is crying. I should see what’s wrong.” As you weren’t at the party, I choose today to relate this story to you. Specifically, I need to choose the form of the auxiliary for (45).

- (45) Peter thought that Mike ___ crying. [is / was]

To an English speaker, the obvious answer is the past tense form of the auxiliary, *was*. The use of the present tense is awkward here, unless Mike is still crying now. The past tense is used in the embedded clause even though the action was simultaneous with Peter’s thinking. Compare this with the (44b) where there are really two past tenses. The phenomenon in (45) is called the sequence-of-tense, and is a morphological rule of English and some other languages. Russian and Japanese use present in exactly the same context, presumably because of the simultaneity with the reference time. Thus, the Russian equivalent of (45) in this context is:

- (46) Petja dum-al, čto Miša plak-al. -al = past, masculine, singular.

P. thought, that M. cried.

Our expectation does seem to be borne out, then. Namely, there are cases in which a morphological context requires certain morphological features (such as past) even in contexts where those features are not interpreted (the sequence of tense context in English, where the lower past is not semantically active). This is expected to be possible on a theory which treats inflection as a kind of agreement in features, as we have done, but it is less obvious how to accommodate such phenomena if we were to have treated the affix *-ed* as introducing a semantically visible feature PAST into the WST.

6.5.3 More verbal inflection

Let’s look at another example. The forms in (47) give two simple tenses of French verbs, the present and the imperfect. The forms correspond to the spoken language, with variation in the pronunciation of “r” ignored. Assume also that there is a phonological rule as given (this is a simplification).

- (47) French:

phonological rule $\epsilon \rightarrow j / __ V$

‘to speak	present	imperfect/past
1 sg	parl	parlɛ
2 sg	parl	parlɛ
3 sg	parl	parlɛ
1 pl	parlɔ̃	parljɔ̃
2 pl	parle	parlje
3 pl	parl	parlɛ

First we factor the stem as *parl* ‘speak’. In the present tense, we find two agreement suffixes, and a bare form used everywhere else. This is given in (48) again using the elsewhere concept and a disjunctive list with a single zero affix (the order between the first two elements is free). These constitutes the allomorphs of a single abstract morpheme, to which we have given the label AGREEMENT.

(48) AGREEMENT

-ō	□	[1 pl]
-e	□	[2 pl]
-Ø	□	<elsewhere>

Now consider the imperfect tense forms. Here we see the same verbal root and the same agreement suffixes, but there is an additional segment, occurring in all forms once we take into account the phonological rule given, specifically the segment /ε/. Since this occurs in all and only the imperfect forms (among those under consideration) we treat it as a tense morpheme, specifically the imperfect.

French then differs from English in that while English has a single inflectional morpheme in which either tense or agreement features may be realized, in French the Tense morpheme and agreement morpheme are discrete. We may thus assign French verbs the structural schema in (49); we could assume that there is always a tense morpheme then, but that its exponent is a phonological zero in the present tense. Where English has a single inflectional morpheme, the two inflectional morphemes of French, and their allomorphs, are given in (49b).

(49) a. French verbs: stem – TENSE – AGREEMENT

b. TENSE			AGREEMENT		
-ε	□	[imperfect]	-ō	□	[1 pl]
-Ø	□	<elsewhere>	-e	□	[2 pl]
			-Ø	□	<elsewhere>

XX TREE FOR FRENCH

Although French and English share the same types of features in their inflectional morphology (tense, agreement), they appear to differ in the structure of the inflected verb which expresses these features. An important, though still open, question is to what extent these structural differences in the morphology correlate with structural differences in the syntax.

6.6 Layered Defaults and Underspecification

The lists of allomorphs for inflectional morphemes that we have used make use of the notion of an elsewhere case. This notion rests crucially on the concept of **underspecification**. Consider again the allomorphs of the regular English verbal inflection that we have discussed above.

(50) Infl (English)

- a. -ed $\square$ past
- b. -s $\square$ 3 sg
- c. $\emptyset$ $\square$ elsewhere

The first allomorph *-ed* is specified to occur in a [past] environment. This is what licenses the occurrence of this allomorph in a sentence such as *Mary walk-ed to school*. But notice that the context involves more than simply the feature [past]—there is also a third person singular subject. By listing the *-ed* allomorph first in the disjunctive list, we assert that when the context has the features [past, 3 sg] the allomorph triggered by the [past] feature will win out. At the same time, we must adopt a theory in which allomorphs are inserted by *best match* to context, rather than by *exact match*. The allomorph *-ed* is triggered by [past] which does not conflict with the syntactic context [past, 3 sg], but also does not match that context exactly. The specific formalism we can use for *best match* is sometimes called the **Subset Principle** and we state it here.

(51) Subset Principle (this formulation from Halle 1997 via Noyer)

'The phonological exponent of a Vocabulary item is inserted into a morpheme... if the item matches all or a subset of the grammatical features specified in the terminal morpheme. Insertion does not take place if the Vocabulary item contains features not present in the morpheme. Where several Vocabulary items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen.'

The subset principle and disjunctive ordering allows us to eliminate some redundancy in the Italian nominal and adjectival inflection, as we noted but did not discuss, above. Recall the basic four allomorphs of adjectival agreement repeated here as (52a)—(52b) provides the same information with redundant features eliminated.

- | | | | |
|---------|--|----|--|
| (52) a. | -e $\Leftrightarrow$ fem. pl.
-i $\Leftrightarrow$ (masc.) pl.
-a $\Leftrightarrow$ fem. (sg.)
-o $\Leftrightarrow$ (masc. sg.) | b. | -e $\Leftrightarrow$ fem. pl.
-i $\Leftrightarrow$ pl.
-a $\Leftrightarrow$ fem.
-o $\Leftrightarrow$ |
|---------|--|----|--|

How do we know which features are redundant? Look at the third line in (52), the theme vowel *-a*. This vowel surfaces (a few irregular nouns aside) in the feminine singular. In (52b), it is specified only as feminine. Why do feminine plurals not get incorrectly marked with *-a*? Here, disjunctivity is important—there is a more highly specified allomorph, namely *-e*, which is encountered first (reading the list from top to bottom) and feminine plurals match the context for insertion of this allomorph. So, going down the list, by the time one gets to consider inserting *-a*, the only feminines which are left are the singulars. Explicit specification of singular would be redundant. The same reasoning allows us to eliminate the feature *masc* in the second line. Importantly, the elsewhere case is now seen, correctly, to be the allomorph that has no explicit feature specification. On an underspecification approach, this is the definition of an elsewhere case—it is compatible with any context, and is therefore inserted just in case no other allomorph

is a better fit for some context. The related notions of redundancy, underspecification and elsewhere at this point look like a bit of theoretical housecleaning—we will see below that these are not merely questions of notation but have implications for the empirical domain (see also Chapter 6a).

Note importantly, that with the ordering given only those features indicated by parentheses in (52a) are redundant. For example, specifying *-i* as $\Leftrightarrow$ masc. would yield the incorrect result that both singular and plural masculine adjectives would take the theme vowel *-i*. We might also note at this point that in doing analysis of inflection, it is often easy to make small mistakes that have significant consequences. A useful self-check is the following: after constructing an underspecified list such as (52b) on the basis of some set of data, on a fresh paper use (52b) as the instructions to recreate the data. For Italian, we know there are two genders and two numbers, so one would draw a blank 2 x 2 table, as in (53a). The table can then be filled in step-by-step proceeding downwards through the list in (52b), as the numbers in (53b) indicate. Thus, the fem. pl. cell of the table is filled in first, as *-e*, then all remaining plural cells (of which there is only one), followed by all remaining feminine cells, and then the elsewhere case assigns a form to all remaining cells (again, there is only one here). This type of table is often called a *paradigm*, and we will make use of this way of presenting inflectional data repeatedly in what follows.

	sg	pl			
m			→	m	sg
f				f	pl
					④-o
					②-i
					③-a
					①-e

(53) Italian a.

b.

6.6.1 More underspecification

The table in (54) constitutes the paradigm for the past tense of the so-called ‘weak’ verbs in German (as in English, the weak verbs are those which show no change in vowel quality across tenses).

(54) German (weak) Past Tense: sagən ‘to say’

	singular	plural
1 st person	sagtə	sagtən
2 nd person	sagtəst	sagtət
3 rd person	sagtə	sagtən

Our principles of segmentation should quickly allow us to identify the following pieces. First, the root is *sag*—this is the only string which is common to both the infinitive and the finite forms. Next, we observe that like French but unlike English, German finite verbs can be followed by both a Tense morpheme and an Agreement morpheme (in that order). It is plausible to assume that *-tə* is this tense morpheme, as it occurs in all the finite (past tense) forms, but not in the infinitive (hence an ‘all and only’ distribution). We will see later that this is a past tense morpheme. Of interest now is the range of allomorphy in the agreement morpheme. The complete list of allomorphs is given in (55).

- (55) a. Ø □ [1sg]
 b. -st □ [2sg]
 c. Ø □ [3 sg]
 d. -n □ [1 pl]
 e. -t □ [2 pl]
 f. -n □ [3 pl]

There is some redundancy in this list. In particular, there is homophony between a. and c., and between d. and f. The technical term for homophony in inflection is *syncretism*. The first question to ask when faced with syncretism is whether that syncretism is accidental (like the homophony between *hear* and *here*), or whether something deeper accounts for the homophony. There is massive syncretism in English, for example, all present tense forms of a regular verb, other than the third person singular, are homophonous with one another. Above, we treated this not as accidental homophony, but rather by positing a zero morpheme as the elsewhere case.

In German, we are faced with two good candidates for elsewhere cases. If we were to look only at the singular forms, we could say that *-st* □ [2sg] and Ø is the elsewhere case. Similarly, if we were to look only at the plural, we could say that *-t* □ [2pl] and *-n* is the elsewhere case. There can’t be two elsewhere cases in a single disjunctive list (*practice: if you do not see why this is the case, try to work it out—draw up a list and a corresponding paradigm—will the second elsewhere allomorph ever occur?*).

It is at this point that the concept of underspecification becomes important. Consider the disjunctive list in

(56) German Agreement (Past):

- | | | | | |
|----|-----|---|--------------|--|
| a. | -t | □ | [2 plural] | DO YOU SEE HOW THIS GETS THE CORRECT
RESULTS AND CAPTURES THE INTUITION
THAT <i>-n</i> IS THE DEFAULT <i>IN THE PLURAL</i> ? |
| b. | -n | □ | [plural] | |
| c. | -st | □ | [2] | |
| d. | Ø | □ | <=elsewhere> | |

By specifying the context for *-n* as [plural] we are invoking a partial specification. It is not truly an elsewhere case, or *default*, but it is the default *in the plural*. That is, we assert that it will occur in all plural environments where there is no more highly specified allomorph. There is such an allomorph for the second person in the plural, but the first and third persons will share the *-n* allomorph. Thus, (56) accounts for all the forms in (54), without homophony—the syncretism arises because of the underspecified nature of the contexts of insertion for the allomorphs.

(Note: as it stands, we could just as easily have presented a list as follows:

(57) German Agreement (Past): Alternative

- a. -st ☐ [2 singular]
- b. -Ø ☐ [singular]
- c. -t ☐ [2]
- d. -n ☐ <=elsewhere>

There are no flaws with this alternative, and it illustrates the same point, line b. is the default in the singular, although there is another true default lower down the list. A potential consideration in favour of (57) is that the *-n* ending in the infinitive could be considered part of the same allomorphy, and thus not accidentally homophonous. A consideration going the other way, in favour of (56), is something we may call *markedness*, which we will touch on below. In brief, as idea that many linguists share is that in a list where only one of singular or plural is to be overtly specified, the plural will be specified and the singular will be the elsewhere case. Deciding between (56) and (57) is ultimately important, but does not affect the illustration to be made here and we will therefore move on. Note, incidentally, that similar considerations apply to (52)).

Let's look at another case. Example (58) gives the nominative forms of the Russian third person pronouns (these are underlying forms, we abstract away from stress and the associated vowel reduction rule under which unstressed *o* is pronounced as *a*; we also ignore the possibility of an unpronounced *yer* vowel in the masculine singular). Like Italian nouns, Russian third person pronouns are bimorphemic, with a root *on* followed by a theme vowel (the same theme vowels show up in regular nouns, verbal inflection and so-called “short” adjectives as well).

(58) Russian third person pronouns (nominative)

	singular	plural
Masculine	on	oni
Feminine	ona	oni
Neuter	ono	oni

There is syncretism in this paradigm—the three plural forms are identical. There are at least two ways one could formalize the syncretism in the theme vowel, within the underspecification formalism we have developed so far, as given in (59) (note that the relative order of the different genders in the singular is not crucial at this point).

(59) Two analyses: /on/ +

- a. -o ☐ [neuter, singular] b. -i ☐ [plural] (*must be ordered 1st*)
- a ☐ [feminine, singular] -a ☐ [feminine]
- Ø ☐ [singular] -o ☐ [neuter]
- i ☐ <elsewhere> Ø ☐ <elsewhere>

Analysis (59a) treats the *-i* suffix, which occurs in three of the six cells in (58), as the default. One consequence of treating *-i* as the elsewhere case is that the feature [singular] must be repeated in the context for each of the other allomorphs in (59a).

In contrast, in (59b) each allomorph is characterized by a single feature, after redundant features have been eliminated. At the top of the list, the analysis in (59b) directly expresses the observation that the forms which end in *-i* do not have a random distribution in the paradigm space, but rather occur in *all and only* the forms which are [+plural]. After the plural forms are accounted for, the remaining theme vowels also have distributions which may be tied to a single feature in the cells that are left (namely the singular cells). In this way, (59b) captures the distribution of the theme vowels in terms of **natural classes**.

XXX Define and discuss **natural class**

An analysis which expresses distribution in terms of natural classes (defined by features) seems to provide a more direct relationship between sound and meaning than an analysis such as (59a). In (59b), it is asserted that *-i* is correlated with the feature [plural] and therefore will occur in all and only plural contexts. The allomorph *-i* on this analysis is incompatible with non-plural contexts. The analysis in (59a) also restricts *-i* to plural contexts, but for a different reason. On the (59a) analysis, the allomorph *-i* is in principle compatible with non-plural contexts, but it just never gets the chance to be inserted in such contexts, because there is always some better fit (one of the singular theme vowels).

Many linguists share the hunch that analyses which appeal to natural classes are more natural and thus superior. There is also one formal criterion on which (59b) may be said to be simpler than (59a), namely the number of occurrences of non-redundant features needed to state the analysis. The list in (59a) requires five non-redundant features (singular counts as three, as it occurs three times) whereas (59b) requires only three features. It is not clear what the importance of this counting metric is—it is in particular very hard to imagine how a child might make use of such a metric in the course of language acquisition. Neither of these arguments are entirely conclusive. Though we accept that (59b) is a better analysis, one wonders whether there is not a more conclusive argument to show that the difference between (59a) and (59b) goes beyond naturalness and theoretical parsimony (i.e., simplicity)? Put differently, given that (59b) is in some measurable sense simpler than (59a), is there any reason to believe that the simpler theory is actually correct? This turns out to be a difficult question, and we will return to it in section 6.6.2 below. But first, let's sharpen our theoretical tools by examining one more case of inflectional syncretism.

Table (60) provides a selection of third person pronouns from Old English. Like Russian, there are two numbers and three genders. We have added here an additional dimension, namely the distinction between nominative and accusative case forms. (Old English has more cases, as does Russian, we are simply limiting the data set for exposition.) Technically, then, the paradigm space should have a three-dimensional representation, with $2 \times 3 \times 2 = 12$ cells. We authors don't quite know how to achieve multi-dimensionality on our printers, so we will use a familiar two-dimensional table, though keeping in mind that this reduction to two-dimensions obscures some of the natural classes in the data. For example, the *nominative* forms constitute a natural class, but they are split over non-adjacent columns in the table in order to group the singular and plural forms together.

(60) Old English third person pronouns (“Direct” Cases = Nominative & Accusative)

	Singular		Plural	
	Nominative	Accusative	Nominative	Accusative
Masculine	he:	hine	hi:e	hi:e
Feminine	he:o	he:o	hi:e	hi:e
Neuter	hit	hit	hi:e	hi:e

A phonological rule lowers (short) /i/ before a non-high vowel. Undoing the effects of this rule, we clearly identify the third person pronoun stem /hi/ and a series of endings, presented in (61). The table also indicates the patterns of syncretism that we see in the data.

(61) Syncretism in the Old English Direct Case Pronoun Endings:

	Singular		Plural	
	Nominative	Accusative	Nominative	Accusative
Masculine	e	ne	ie	
Feminine	eo			
Neuter	t			

As in Russian, the patterns of syncretism respect natural classes. We posit the disjunctively ordered list of allomorphs in (62). The curved lines indicate crucial orderings. The plural allomorph must be listed before all others—as in Russian this ensures that this allomorph will be inserted in all and only plural contexts. The next lines indicate that both (62b) and (62c) must be ordered before (d) and (e), however, the internal ordering between (b) and (c) is not crucial. This is because no context can ever be simultaneously feminine and neuter, hence these two allomorphs are not strictly in competition with one another. Finally, we have chosen to mark the accusative allomorph (d), and thus it must occur before the elsewhere allomorph. We could just as easily have exchanged these two allomorphs, with *-e* as [nominative] and *-ne* as the elsewhere case. The choice here is motivated by conditions of typological frequency: nominative forms are usually less marked than accusative forms. These markedness conventions do not form part of the material covered in this textbook, however.

- (62)
- | | | | |
|----|----|--------------------------|--------------|
| a. | ie | ☐ | [plural] |
| b. | eo | ☐ | [feminine] |
| c. | t | ☐ | [neuter] |
| d. | ne | ☐ | [accusative] |
| e. | e | ☐ | <elsewhere> |
-

Like Russian, there is an alternative description available which assigns the form that occupies the most cells to the elsewhere case, given in (63).

- (63)
- | | | | |
|----|----|--------------------------|-----------------------------------|
| a. | ne | ☐ | [masculine, singular, accusative] |
| b. | e | ☐ | [masculine, singular] |
| c. | eo | ☐ | [feminine, singular] |
| d. | t | ☐ | [neuter, singular] |
| e. | ie | ☐ | <elsewhere> |

The considerations of generality, natural classes and complexity that applied in Russian apply here as well. In order to block the appearance of any of the first four affixes in the plural, we need to explicitly state that they are singular. This comes for free in (62). Indeed, this analysis has 10 features in the contexts, while (62) has only 4 [not counting the elsewhere conditions].

In section xxx below, we will refine our machinery somewhat and consider some more complex cases. First, having now understood how underspecification theory allows for elegant statements of allomorphy that capture natural classes, let us return to the question of whether this approach can be shown to be superior to a more cumbersome approach which invokes full specification of allomorphs.

6.6.2 An Empirical Argument for Underspecification

Let's take a moment to consider why this task proves to be so difficult.

What it would take to compare two analyses like those in (59)? These analyses represent competing hypotheses (in this case about the organization of Russian inflectional allomorphy). Competing hypotheses can be evaluated on the basis of the predictions they make when extended to new data. We discussed this in chapter 1 regarding *nonce* words. The *Wug* test, mentioned in chapter 1 is a classic example of the comparison of two hypotheses by exploring the predictions with respect to new data. For inflection, nonce words are not at issue; (59a) and (59b) make the same predictions about how new stems will inflect. What we need to look at are new inflectional categories. What happens if Russian suddenly acquires a new number category that is neither singular nor plural? Since *-i* is associated directly with plural in (59b) but is the elsewhere category in (59a), the predictions are in principle distinct. But noone has demonstrated a viable way of testing this. Inflection categories are quite typically a closed class of features, new ones can't simply be added on the spot. To the extent that languages do acquire new inflectional categories, this often is the result of language contact, and the new categories come with the morphology that signals them.

Despite the general problem of the closed nature of inflectional systems, some very interesting observations have emerged which approach the issue from a slightly different angle and provide strong arguments that underspecification (and elsewhere) are fundamental properties of inflectional systems and not just an issue about theoretical elegance.

We'll consider two arguments here (and another in more detail in chapter 6a). The first argument involves comparing Russian with a case in which the allomorph with widest distribution does not constitute a natural class and must therefore be the default. Table (64) gives the present tense forms of the verb *be* in English.

(64) English forms of the verb *be*:

	singular	plural
1 st person	am	are
2 nd person	are	are
3 rd person	is	are

The form *are* occurs in all the plural forms, but it also occurs in the 2nd person singular. Unlike Russian *-i*, there is no way to state this distribution in terms of a single feature, or even a conjunction of features. An attempt to state it as “[plural] or [2nd singular]” contains the word “or”, for which the formal term is a “disjunction”. This is formally the same as positing two homophonous occurrences of *are*. For these reasons, we treat *are* as the elsewhere case, and set up the list of allomorphs in (65).

- (65) am □ [1, sg.]
is □ [3, sg.]
are □ <elsewhere>

Now, this list derives the correct forms in most contexts where the finite form of *be* is required. For example, it will fill in the blanks correctly in (66).

- (66) a. I __ reading a book. am
b. You __ reading a book. are

- c. She ___ reading a book. is

Now consider the syntactic frames in (67). These involve what are called “tag” questions, but the same point can be made for any negative questions with the contracted negation *n’t*.

- (67) a. You ___ next, ___ n’t you? → You are next, aren’t you?
 b. She ___ next, ___ n’t she? → She is next, isn’t she?
 c. I ___ next, ___ n’t I? → I am next, *amn’t I?

The forms predicted by (65) are given on the right. For everything except first person singular, (65) makes the correct predictions. But for most speakers of English, the string *amn’t I* is unacceptable, and the wrong prediction is made for (67c). Now, it’s not really understood why *amn’t* is unacceptable (and in fact it is used in some varieties of English), so, with the understanding that there is more to be understood here, we will content ourselves with invoking a special restriction, called a *filter*, which simply encodes this observation.

(68) The English *amn’t* filter.

*amn’t

Now, one might think that the filter in (68) makes the frame in (67c) unusable, but for many speakers, that’s not correct. Interestingly, for negative questions with the contracted negation, speakers use the form *are* (as in (69a-b)) which is otherwise unacceptable with a first person singular subject, as (69c-d) show.

- (69) a. I am next, aren’t I.
 b. Aren’t I next?
 c. *I are reading a book.
 d. *I aren’t next.

At this point, we have two questions to answer. Why is it that *are* can ever be used with a first person singular subject, and why is this use restricted to inverted negative questions? If *are* is lexically specified as occurring with second person and/or plural subjects, (69a-b) would be straightforwardly not predicted. However, the statement of allomorphy in (65) provides an answer to these questions. The distribution of allomorphs of *be* in (64) required us to treat *are* as the elsewhere form. By definition, the elsewhere form is compatible with any syntactic context, including first person singular, but is used only when there is no more highly specified form that is a better fit to that context. This answers the first question—there is no feature incompatibility between 1sg and *are*. The second question is answered by (65) in combination with the special filter in (68). This filter will block the insertion of *am* from the list in (65) just in case *am* would be inserted before a contracted negation (as in the second underline in (67c)). Since the first allomorph is blocked, we proceed further down the list of allomorphs, and the next best fit in this particular context is *are*, the elsewhere case. The underspecification approach to the distribution of the allomorphs of *be* predicts that the form *are* will be used whenever no better fitting allomorph is available. Although the “normal” cases are a closed system, this prediction emerges in the more obscure corners of the language where, for example, a filter such as (68) renders a normal form unusable. At this point, only the underspecification theory predicts the outcome of such cases, and it makes the correct predictions. This constitutes a strong argument in favour of such an account.

We’ll now consider another case which is formally quite similar, as it is important to show that the above discussion is not some unique quirk of English. Since the point is ultimately the same, we will provide only brief sketch here, and not explore a number of additional complexities discussed in the literature.

The basic word order in Spanish, like English, is subject-verb-object. When the object, direct or indirect, is a non-emphatic pronoun, though, it surfaces instead as a *clitic*. Clitics are odd creatures, being phonologically closely connected to an adjacent word, but not quite so close as to be fully phonologically incorporated into their *hosts*. Luckily, the thorny phonological issues do not really concern us here, and so we can just note their existence. The pairs in (70) and (71) illustrate the use of clitic pronouns for direct and indirect objects, respectively.

[constructed, check word order, etc.]

- (70) a. Dieron **el premio** a Pedro.
 they.gave the prize to Pedro
 ‘They gave the prize to Pedro.’
- b. **Lo** dieron a Pedro.
 [Arg.3.acc] they.gave to Pedro
 ‘They gave it to Pedro.’
- (71) a. Dieron el premio **a Pedro.**
 they.gave the prize to Pedro
 ‘They gave the prize to Pedro.’
- b. **Le** dieron el premio.
 [Arg 3.Dat] they.gave the prize
 ‘They gave him the prize.’

Spanish has a large inventory of clitics, to which we would assign features accordingly. For the clitics in (70) and (71), we might assign features as illustrated. We have included a feature “ARG” for argument clitic, this distinguishes these clitics from the non-argument clitics used for locations and the like. Spanish also has a clitic *se*, which is used in a variety of contexts. Some of these contexts are illustrated in (72).

- (72) a. *se*

The contexts in which *se* occurs do not form a natural class. The one common feature, if any, is that *se* replaces an argument of the verb (for example, indicating coreference with another argument in the case of reflexives, or indicating the absorption/suppression of an argument in the case of the medio-passive). The traditional approach is to list the various functions associated with *se* separately, in effect, treating the different contexts as involving homophonous clitics. The logic of underspecification theory leads us instead to set up a list of clitic allomorphs, in competition with one another, in which *se* is the least specified. A part of this list would include the entries in (73).

- (73) a. *le* ⇔ [Arg. 3. Dat]
 b. *lo* ⇔ [Arg. 3. (Masc)]
 c. *se* ⇔ [Arg]

Now, it turns out that Spanish, like English, has some filters that block otherwise expected combinations of morphemes. One such filter (with analogues in many other languages) is:

- (74) a. No Dative clitic before an accusative clitic. *DAT / __ ACC

Consider now a context with third person direct and indirect objects, as in (75a). Given what we know to this point, what might we expect for the clitic counterpart in (75b)?

- (75) a. Dieron el premio **a Pedro.**
 they.gave the prize to Pedro
 ‘They gave the prize to Pedro.’
 b. _____ dieron.
 [Arg 3.Dat] [Arg.3.Acc]they.gave
 ‘They gave it to him.’

In order to answer this question, you will need to know that the insertion of the clitics proceeds from right to left, that is, the second (ssyntactically lower) clitic is inserted first (there probably good reasons for this, partly syntactic, and related to the notion of the *cycle* discussed in Chapter X; we will just assume this order here). The derivation is started for you in (76).

- (76) Context Features: [Arg 3 sg DAT] [Arg 3 sg ACC] **1** lo

The first clitic inserted is *lo*. The filter as stated in (74) does not apply at this point, since *le* has not been inserted. At the next step of lexical insertion, though, the filter will block insertion of *le*, i.e., the clitic that matches the context features in the same way that a filter blocked insertion of *am* in (67c). Once again, underspecification predicts the outcome: a less marked allomorph will be inserted, even though that allomorph normally is unacceptable with this feature combination. This is exactly correct—the outcome predicted by our model is what has been called the *spurious se* rule in studies of Spanish clitics.

- (77) **se** **lo** **dieron.**
 [Arg 3.Dat] [Arg.3.Acc]they.gave
 ‘They gave it to him.’

The two cases just considered show how underspecification theory yields predictions about inflection. Although inflection is normally a closed system, for which all forms are known and thus it is incorrect to speak of predictions, many inflectional systems are subject to ill-understood filters which disrupt the normal patterns. The underspecification approach makes very specific predictions about what will happen in case of such disruptions, specifically, underspecified forms will be used in contexts of this sort. Note importantly that this relies on underspecification—the theory would be in need of revision if we were to find cases of *spurious lo* in Spanish or the spread of *am* to other persons in response to filters. The response to filters is predicted to always be retreat to a less marked form. If this characterization is ultimately correct, this provides a very strong argument for underspecification theory.

6.6.3 Underspecification again

Since we are typically dealing with a small array of forms, the available data generally underdetermines the theory. That is, for a given paradigm, there may be more than one analysis that gets the correct results (this is usually true, in fact). We call this “descriptive adequacy”. However, as we have just seen, it is often the case that one of these analysis is superior to the others. We call this “explanatory adequacy”.

Descriptive Adequacy: An analysis which tells you *what* all the surface forms are.

Explanatory Adequacy: An analysis which gives you insight into *why* the forms are the way they are.

How do we look for the best analysis among different descriptively adequate analyses?

How do we achieve explanatory adequacy?

- (78) STEP 1: Look for forms that can be tied to a single feature.
Ex. the Old English ending *-ie* occurs in all the plural forms,
AND occurs nowhere except the plural forms.
It is a safe bet to call *-ie* [plural]
- STEP 2: Repeat Step 1 with the remaining forms.
Ex. *-eo* and *-t* can each be tied to a single feature (feminine, or neuter, respectively) once the plural forms are accounted for.
- STEP 3: Look for forms that would fit in Step 1, if you could ignore one or more forms, and where the form(s) you can exclude can be tied to a specific combination of features.
[Keep in mind that ELSEWHERE is the biggest natural class of all.]
Ex. German (repeated):

- (79) German (weak) Past Tense: sagen ‘to say’ (from above)

	singular	plural
1 st person	sagtə	sagtə-n
2 nd person	sagtə-st	sagtə-t
3 rd person	sagtə	sagtə-n

Here’s how the steps correspond to the reasoning we used above in analyzing these forms.

Steps 1 (and 2) are not applicable. There are forms that occur in more than one cell, but they do not define natural classes, e.g., *-n* [1 **OR** 3 plural].

Step 3. If you take out *-t* which occurs only with [2 plural], you are left with *-n* defining a natural class [plural]. If you take out *-st* [which occurs only with [2 sg], you are left with $\emptyset$ defining a natural class [singular].

- (80) German Agreement (Past):

-t	□	[2 plural]
-n	□	[plural]
-st	□	[2 (singular)]

Ø □ <elsewhere>

6.6.4 Homophony... When All Else Fails

(81) Homophony Happens:

This is a last resort—it amounts to an admission of irreducible randomness in the world.

STEP 4: (Only when all else fails) we must sometimes accept accidental homophony, i.e., forms which sound the same but occur in more than one place in our statements. (cf. *-t* in English TENSE)

(82) German (weak) Present Tense: sagen ‘to say’

	singular	plural
1 st person	sag-ə	sag-ən
2 nd person	sag-st	sag-t
3 rd person	sag-t	sag-ən

Because the *-t* occurs in two cells, that do not themselves form a natural class, we would have to treat it as a default if it is a single allomorph. This would mean it is listed last in the statements of allomorphy, and therefore it would not be able to block *-ən*. In order to block *-ən* in the 2nd person plural, we need to have a more highly specified context for *-t*.

Work through this, you will see that this paradigm is impossible to capture on the assumptions we have motivated so far.

(83) Analyses with homophony:

a. 2 □ *-t*

-t	□	[2 plural]
-ən	□	[plural]
-ə	□	[1 (singular)]
-st	□	[2 (singular)]
-t	□	[3 (singular)] / <elsewhere>

b. 2 □ *-ən*

-ən	□	[1, plural]
-ən	□	[3, plural]
-ə	□	[1 (singular)]
-st	□	[2 (singular)]
-t	□	<elsewhere>

- As it turns out, there is a reason to distinguish two *-t* suffixes in German inflection.

(84) German (strong) Present Tense: lesen ‘to read’ e = [e], ie = [i]

	singular	plural
1 st person	les-ə	les-ən
2 nd person	lie(s)-st	les-t [e]
3 rd person	lies-t [i]	les-ən

fahren ‘to drive’ ah = [a:], äh = [e]

	singular	plural
1 st person	fahr-ə	fahr-ən
2 nd person	fähr-st	fahr-t [a]
3 rd person	fähr-t [e]	fahr-ən

The two *-t* suffixes have different phonological effects on certain stems. Stems that are susceptible to vowel change (ablaut) undergo this process only when the 3rd person singular *-t* is added and not when the 2nd person plural *-t* is added.

(85) You should not, in principle be surprised by the existence of two *apparently* homophonous affixes (or more properly in this case, allomorphs), with different phonological behaviour and different “meanings” (i.e., “functions”).

We saw exactly this behaviour in the discussion of cyclicity, where two affixes could be homophonous, but differ as to whether or not they trigger cyclic rules.

6.7 Stem Allomorphy

We have not yet talked about the kinds of marking of past tense in English which are traditionally described as “strong” or “irregular” verbs, i.e., verbs like the following where the main vowel changes in different tenses.

(86) English verbs

write wrote	(written)	The difference between present and past
drive drove	(driven)	tense (and sometimes also the participle) is
run ran		apparently signalled by the quality of the vowel.
drink drank	drunk	
ring rang	rung	

Some German plurals work this way too – the only overt signal of plurality is the change in vowel (ablaut).

(87) German plurals

single	plural	
Apfel [apfəl]	Äpfel [ɛpfəl]	‘apple(s)’

Mutter [mʊtə]	Mütter [mʏtə]	‘mother(s)’
Bruder [brʊ:də]	Brüder [brʏ:də]	‘brother(s)’
Kloster [klɔstə]	Klöster [klœstə]	‘convent(s)’
cf. English:	goose – geese, mouse – mice	

There are also some English plurals which undergo a consonant change in the stem in plural formation.

(88) English plurals

leaf [li:f]	leaves	[liv-z]	
shelf [...f]	shelves	[...vz]	
house	[hʌws]	houses	[hæwzəz]

This is not predictable from English phonology and must be learned. as XX shows.

(89) [f] → [v] leaf, shelf, house → leaves, shelves, houses

[f] → [f] reef, fife, roof → reefs, fifes, roofs

[v] → [v] five, groove, hive → fives, grooves, hives

Thus far, we have isolated the affix in forms like *leaves*, and noted the change in the vowel of the stem as a “stem change.” This is, in fact, very close to what is really going on. But not quite...

We may treat this as allomorphy in the lexical entry of the root. Recall that a leading idea of earlier chapters was the notion that affixes are morphemes, and the only property differentiating affixes from roots was their subcategorization. So, to refresh your memory, here are two examples of allomorphy in lexical entries of morphemes.

(90) The lexical entry for affixes that show allomorphy:

a.	[- (n)ka /		
	[-nka/V__		
	[-ka/< elsewhere >		
	"person from X"		
	N [- (N)		
	[feminine]		
b.	INFL (simplified)		
	[-d/[past]		
	[-z/[3 sg]		
	[-Ø/< elsewhere >		
	function : inflection		
	attaches to V		

We can then invoke the same tool (allomorphy) to account for the changes in the stems that show such changes. Example XX contrasts a root which shows no allomorphy with one that shows allomorphy.

(91) Two lexical entries:

a.		/dawg/		b.		/liF/	
	{no allomorphy}				liv /	[plural]	
	"canine" /Fido				lif /	< elsewhere >	
	Free Root				"folio" thing on tree		
	Noun				Root		
	< R >				Noun		
					< R >		

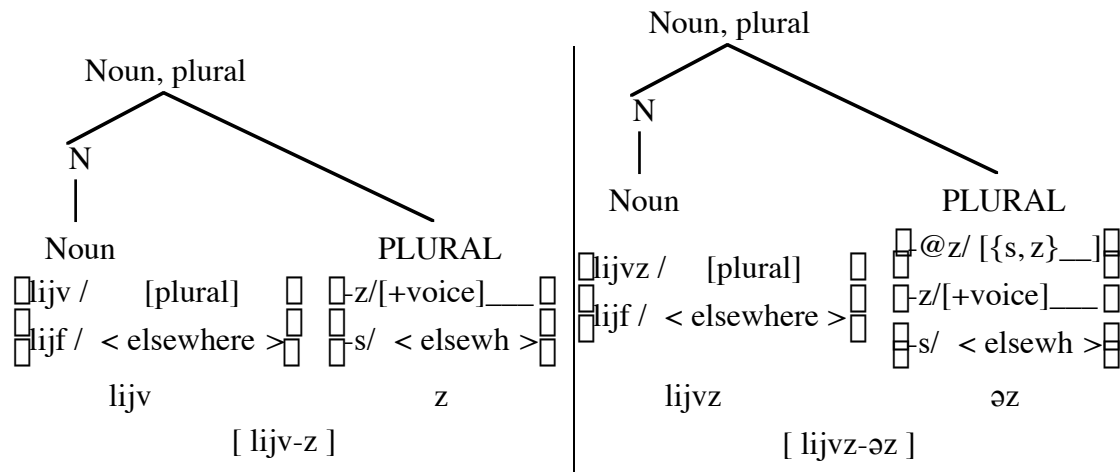
Important Note:

The plural allomorph of the root “leaf” is NOT /livz/

Why not?

(92) CORRECT

INCORRECT



Words such as *leaves* are structurally regular. Plural is marked by the appropriate allomorph of the English plural affix for a voiced stem. The unpredictable portion of the word is only the spontaneous voicing of the stem-final consonant. Therefore, only that voicing alternation is represented in the lexical entry of LEAF, and similarly for the other forms.

It is less obvious that a pair like *run~ran* can be described as having a normal allomorph of the English past tense affix. In fact it does.

English inflection includes three distinct allomorphs that mark the past tense, and we have ignored these above. These allomorphs are visible in verbs without stem changes, and they are:

(93) the “regular” allomorph /d/, subject to phonological rules yielding three surface allomorphs -əd, -t, and -d;

a fixed -t, which surfaces even after voiced consonants:

*dwell – dwelt * dwelled*

zero

hit – hit, etc.

The latter two affixes are lexically conditioned and are thus listed before the “regular” allomorph, see the discussion of the English plural, above.

Because English has a zero affix for the past tense in any event, it makes sense to assimilate past tense forms such as *ran* to our system by positing a combination of stem allomorphy (the vowel change) and the lexically conditioned, but independently attested, zero affix. Thus, *ran* has the structure like *leaves*:

tree + allomorphy

In fact, we can make a much stronger argument that this must be the case. Since we treat the root allomorphy as separate from the allomorphy at the Infl terminal node, nothing in our theory precludes us from seeing overt changes at both nodes for the same word. What we expect, in other words, is verbs that show stem changes, but at the same time have an overt marker of the past tense in the form of one of the non-zero allomorphs of the past tense.

And this is exactly what we find, not only for the past tense, but also for the -n participles.

(94) ABLAUT

NO ABLAUT

pres. past. part.

sing sang sung

bind bound bound

pres. past part.

put put put

hit hit hit

-Ø affixes exist

See handout (Unit 5/...p.74)

There are also forms with and forms without ablaut (or other stem allomorphs) with verbs that occur with the -t allomorph of PAST, with the -en participle and with the default -ed past tense.

(95) *-t*

STEM ALLOMORPHY

pres. past. part.

leave lef-t lef-t

buy bough-t bough-t

NO STEM ALLOMORPHY

pres. past part.

dwell dwel-t dwel-t

(96) *-ed*

STEM ALLOMORPHY

pres. past. part.

tell tol-d tol-d

flee fle-d fle-d

NO STEM ALLOMORPHY

pres. past part.

yell yell-ed yell-ed

play play-ed play-ed

(97) *-en (participles)*

STEM ALLOMORPHY

break(broke) brok-en

drive (drove) drive-en

NO STEM ALLOMORPHY

beat (beat) beat-en

fall (fell) fall-en

	-Ø	-t	-ed	-en
+ Ablaut	bind, see	leave, buy	tell, flee	break, drive
- Ablaut	beat, put	dwell, spell	mind, ski	beat, see

6.7.1 Summary, English inflection

-iŋ	↔	PROG	
-z	↔	3 PRES	
-∅	↔	PRES	
-ən	↔	PART	/ {fall, go, do, bite ...} __
-t	↔		/ {dwell, (go) (think)} __
-∅	↔		/ {bite, sing, (go) (think)} __
-d	↔	(elsewhere)	

- the order between –t and –∅ is not relevant, all other orders are.

Note that there is yet one additional argument in favour of treating English inflection in this manner. Only a small set of verbs have an –n past participle form. Underspecification entails that if a verb is not lexically conditioned to have –n in the past participle, then the next best item on the list will prevail. This item will be the same affix as is used in the past tense.

Thus, it follows from this approach that all participles that are not –n forms will be affixally identical to past tense forms (–t, ∅, or –d) but that they need not be segmentally identical. This is correct:

expand.

6.8 Notes, references

Much of the Italian stuff comes from the work of Lara Riente. See also Scalise.

Are – see Bresnan, response by Frampton.

Spurious *se*. Noted by Perlmutter? Account from Bonet, Harris. data modif. recheck.

OE source = Lumsden diss.

realizational theory of inflection, see esp. Matthews.

English infl < Noyer, Halle & Marantz